

65th ILA CONFERENCE
PROCEEDINGS

International Conference on

"Digital Landscape Re-invention and Re-engineering of Libraries: Issues and Challenges"

Chief Editor
Dr. O. N. Chaubey

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Dr. Gururaj S. Hadagali

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Maharastra University and College Librarians Association
and
Indian Library Association
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2021

Digital Landscape Re-invention and Re-engineering of Libraries: Issues and Challenges

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PREFACE

The 65th International Conference of ILA is one of the notable event as the association has completed 85 years of its existence, since it was established in the year 1933. It is organizing 65th International Conference on a very appropriate and exciting theme **" Digital Landscape Re-invention and Re-engineering of Libraries: Issues and Challenges"**. The theme and all the subthemes selected for the conference was very appropriable and apt to present situation and provided a very good platform for Library and Information Professionals to participate in discussions on various issues related to Libraries and Information Services. Total Nine themes were identified on various issues related to Digital Library Applications, Reinvention, and Re-engineering of Libraries, Emerging and Innovative Technologies, Collection development to content management, Digital Library Services and Information Products, Open Technology, Social Networking, LIS Education, IPR & Professional Ethics in the digital environment. Conference provided a wide platform to Library & Information Professionals to present their ideas and views. Out of total 200 received research communications total 136 were accepted through peer-review process and 95 communications presented through virtual mode. The conference found great opportunity to researchers to express their research ideas and explorations through this nationwide platform of LIS profession. All the accepted papers were distributed under the following sub-themes for the purpose of presentation in the conference in Virtual mode.

1. Digital Landscape
2. Digital Library Applications and Services
3. Reinventing, Re-engineering and Emerging Technology in Libraries
4. IPR, Professional Ethics and Social Networking
5. Collection Development and Open Technology Movement

The advent of embedded technologies has great impact on technological applications of libraries e.g. the Content Development. The Integrated Library Management Systems are now integrating discovery facilities with the use of CMS and the Library Networking has gradually started removing the compartmentalization of different types of libraries. The new technology must find place in the leadership and we have to build the capabilities among our professionals to handle the new technologies effectively and efficiently. The digital age has unlimited potentiality to import technologies and social media facilities

into library services. The Library professional have been facing challenges of managing hybrid resources and equally there are "here today and gone tomorrow" modes of services and products that Libraries are required to entertain. The users' needs are also changing as more and more young users have gained technological knowledge and discovered enough capabilities that can offer them improved and point to point services. The patterns of library use are also on the verge of new demands and horizons. Keeping this in mind, the conference chooses a topic that is contemplated over again and again whether the professionals are required to face new challenges under the sub- themes, Environment friendly library, Capacity building, Change Management and Leadership and others. The Libraries have been adopting technologies since their early days and therefore technological advances which have been embedded in the spirit of adoption to changes. These changes demand new services and to manage the new information and knowledge resources to suit the changing needs of the users. The impact of ICT on libraries and the growth of web and digital resources needs to augment the users with relevant skills and the demand for information literacy is growing from a very early stage. The quality of services needs some benchmarking and to adopt best practices. The papers included in this volume and the authors of these papers have addressed these issues and this International Conference has provided them a suitable platform for proposing these issues for discussion by the learned delegates.

The Organizers of this conference, especially the ILA and Maharastra University and College Librarians Association, Sant Gadge Baba Amravati University (Maharastra) need special mention for selecting this wonderful and thought provoking theme for 65th Conference of the ILA. It is time to look forward on this auspicious occasion to see the transformation of library and information Science Profession in the digital age as its future has many challenges and equally opportunities to discover new professional avenues.

The Editorial Committee has spent their useful hours in reviewing/ editing the papers and offering their support to organize the papers theme-wise. The Editors acknowledge their help and thank them profusely in this context. We thank all the authors for contributing to this 65th International Conference of ILA and enriching the professional knowledge with their scholarly papers.

Thank you one and all
Place: Delhi
Date: 2nd June2021 Editors

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Theme-1

Digital Landscape

Implications of ICTs and Internet of Things (IOT) In Libraries

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Abstract: Information and Communication technologies have transformed the concept of library and information centers. Nowadays libraries are not only the storehouses of books and documents but have transformed in Knowledge Access Centres where innovation and incubation for various ideas, trends and activities of human interaction and knowledge are taking place with the help of Internet. The present study emphasizes the relevance and importance of IOT keeping in view its application and impudence on various library activities such as circulation, preservation of documents, theft management, RFID, tracking the movement of resources and inventory control. The study manifests the role of Information and communication technologies over taking control of various human-based performances to machine-based activities, particularly in library and information centres.

Keywords: IoT, Library and Information Centres, ICT, Smart Libraries

1. Introduction

Brady, Will and Elkner, Jeffery traces the history of information technology in four stages since pre-mechanical age to the mechanical era and then electromechanical to electronic period. According to them, 3000 B.C. to 1450 A.D. period is counted as pre-mechanical age, when, human were developing languages, signs and other communicative medial for sharing and exchanging ideas and information. Alphabets developed during this period including simple pictures and designs known as Phoenician alphabets. They trace that the number system (1-9), discovered by Indians in some around 1000 A.D. Based on number system, calculating devices were developed. They determine mechanical era around 1450 to 1840 A.D. Many new technologies like slide rules used for calculation in analogue computers, Pascaline device by Pascal and concept of difference engine by Charles Babbage were developed during this era. This age witnessed introduction of basic rules, principles and theory which put foundation of advanced information and computer technology around the world. The third stage known as Electromechanical is traced between 1840 and 1940. During this era, various important inventions viz. telegraph, Morse Code by Samuel Morse in 1835, telephone by Graham Bell in

1876, Radio by Marconi in 1894 were invented in first phase of electromechanical period. In the second phase, Marc 1 known as first automatic computer device was developed in the lab of Harvard University in 1940. In the fourth stage, Brady and Elkner elaborate the beginning of computer era where first high-speed digital computer known as ENIVAC was developed and used by United States Army. The computers were developed in five generations where vacuum tubes were used in first-generation computers. Vacuum tubes were replaced with transistors in second-generation computers. In third-generation computers, transistors were replaced with integrated circuits. In the fourth generation computers, a very large scale integrated chip containing memory, logic and controlled circuits was introduced. Fourth-generation computers are based on central processing units which allow its compact size. That is why fourth-generation computers, known as personal computers got places at home and offices rapidly.

Now the information and computer age has been entered in a new era, well known as Artificial Intelligence age. In general sense, artificial intelligence is machine intelligence to perform a particular or group of the task as identical to natural intelligence of humans. Now a day, artificial intelligence is used in various day to day applications like healthcare technology, automotive design, finance and economics control, government functionality, video games, military, artistic visualization, advertisement of products and auditing purposes. Artificial Intelligence plays a vital role in managing the information system in the present scenario. Several databases have been invented with embedded artificially enabled features to enhance searching efficiencies and strategies. Library Management Software for maintaining holdings are also now designed based on artificial intelligence features. Now the world is moving towards controlling routine functions not only in day to day life but also in knowledgebase institutions for facilitating connectivity of execution of a task for better results and efficient outcomes. Internet of Things is the solution for connecting electronic devices for better control and effect of day to day or particular functions of human beings. Implementation of artificial intelligence with Internet of Things has now been used for collection results, evaluation of information collected and storing algorithm based on such assessment and results achieved

2. Internet of Things: Concept and Definitional Outline

The Global Standards Initiative on Internet of Things (2015) elaborates Internet of Things (IoT) as the networking of physical things including gadgets, vehicles and infrastructures and other non-living things which are compatible to embed electronic system having system and application software, sensors and internet

connections for enabling these gadgets with a view to collect and interchange information or data. This elaboration of Internet of Things explains that the term IoT is nothing but the connectivity of physical things including household, electronic and electrical gadgets used by humankind in the ordinary course of living through internet and application of software and sensors for communication among them. On the other side China Communication Standards Association (CCSA) (2011) expounds Internet of Things as network to keep connectivity between human and objects and also between objects and objects for execution instructions for controlling their functionality as per requirement. CCSA determines that this network is assumed to collect information for controlling physical objects following process viz. computing, executing and communicating between humans and objects. International Telecommunication Union is also known as ITU defines IoT in its standards as global interface for enabling advanced functions through physical and virtual interconnection of things for interoperability of ICT

3. Genesis and Historical Development of Internet of Things

The term Internet of Things or IoT was first conceived by Kevin Ashton in 1999. Ashton golden words about the Internet of Things are coined as under: "I could be wrong, but I'm fairly sure the phrase "Internet of Things" started life as the title of a presentation I made at Procter & Gamble (P&G) in 1999. Linking the new idea of RFID in P&G's supply chain to the then-red-hot topic of the Internet was more than just a good way to get executive attention. It summed up an important insight which is still often misunderstood."

After Ashton the term IoT was used by various researchers and scientists working in the field of computer sciences. Neil Gershenfeld, in his book "When things start to think" elaborates the idea of IoT. Neil Gross, in his write-up in Business Week in 1999, assumes that planet will be witnessed of internet skin which will perform humanistic functions for reducing workload of humans. LG announced its first refrigerator based on IoT in 2000. International Telecommunication Unit (ITU) came up with its report on IoT which is considered as the phase of the era of IoT around the world. 'Nabaztag' a robotic rabbit was invented by Violet Company in 2005 which witnessed to share views about stock market news, act as alarm clock, informing about latest news and RSS feeds. The actual birth of Internet of Things is accepted during 2008-2009 when the growth of connecting and introducing things using internet for performing their function, was noticed more than human growth. Internet of Things (IoT) is based on three essential elements viz. Embedded sensors, image recognition and near field communication payment for payment through telephone or other connected devices. IoT is an advantageous

invention for the benefit of humankind. Alexa and Google Talk are some products work on the smart technology based on Internet of Things.

4. Internet of Things and its Applications

Kenton, Will (2019) in his reviewed article published in Investopedia, enumerated various advantages of Internet of Things. The technology has shown its effects in many fields. The treatment and application of IoT can be traced in urban administration and planning where smart chips or devices equipped with IP address may be located in overcrowded roads and thereby alarming the duty staff to divert the traffic and any mishappenings. The city trash can also be nullified if the smart trash vans alarm once they are full to play a more prominent role in waste collection and management. The application of IoT can also reduce the business costs if well planned and executed. Business firms by placing smart chips to their inventory regulators can take track of their account and inventory items. To increase the margin of sale, tracking and evaluating consumer's behavioral aspects can play a more significant role like the production house can change the quality and quantity of their products as per customer specific requirements thereby enlarging their profits. IoT is also playing important role in medicine. For instance monitoring patients records through smart connected devices can result in better treatments within short period and also reducing the time lag of incoming patients to hospitals. Considering the privacy matters the Internet of Things have to take into account specific issues. To overcome the regulatory challenges, the technology needs to put a particular check and balance so that risks may be reduced pertaining to the overuse of these applications.

5. Internet of Things: Applications in Libraries

Bansal et al. (2018) elaborate on several areas where Internet of Things is being used for better deliverance of library and information services. They elaborate various areas of libraries where applications of IoT can be traced viz. access to library and resources, circulation of documents and inventory control, theft management, user identification, tracking movement and inventory control, collection development and information literacy and appliance management.

5.1 Access to Library and its Resources

Internet of Things is majorly effective to use for accessing the library and its resources. Smart card concept is part of IoT example, where the users mark their entry in the library through punching of the card. With the introduction of RFID

technology, the books now get their chip. These chips contain address tag of the book bearing bibliographic details with shelf placement number. The users with the help of OPAC come to know about the availability of the book in the library. With the help of electronic book tracing device, books are easily located by the library staff for quick use by clientele.

5.2 Circulation of Documents and Inventory Control

Circulation of documents with the help of sensors or RFID chip is an excellent example of the use of IoT in libraries. The chip contains information about the physical documents and various types of equipment like RFID Book Tracing Device, Issue Platform and auto return book drop box connected with internet or LAN technology are used for circulation of documents.

5.3 Theft Management

Theft management by apply of EM Tags on documents, CDs, Hard Drives and other electronic devices, may be used for prevention of theft in the library. Library gates which are enabled with sensors compatible with RFID and EM tags are best way-out to prevent library resources. Generally, the gates are embedded with alarm. Sometimes sensors attached with the camera can also be able to send photos on mobile to capture photo of the defaulters.

5.4 User Identification

User identification is another example of the use of IoT in libraries. RFID enabled cards are issued to the library users. As and when the users enter in the library, they have to punch or touch their cards to the sensor-enabled machine for marking their presence in the library. Now a day, face detection technology has also been introduced, which by detection of a face, punch the entry of the users with capturing of photos.

5.5 Reservation of Books

Users can trace the availability of books as required for their study. Online Public Access Catalogue (OPAC) is searched by the users on the mobile phone. The desired books can be searched through the sensor-based search device, which may show the light of budge beep in case of presence of book on shelf. In case of issue of books with other patrons, the required book may be reserved through OPAC window. This application of IoT saves the time of the user and library staff.

5.6 Tracking Movement of Resources and Inventory

IoT may play a more significant role in tracking the movement of library resources and inventory. Library documents may move within and outside libraries for various reasons. Within library, documents may be picked form shelves for reference by the users to move them in reading areas. Outside the library, the document move when getting issued by the users or sent for binding or repairing. In both of the case, librarian can trace the documents through IoT with the help of RFID chip installed in the documents. Inventory control has become very easy after introduction of IoT technology in Libraries.

5.7 Collection Development and Management

Now a day, mobile devices are used for sending recommendations of books and other documents. Library Management Software containing features allow end users to submit their query and recommendation for collection development and management of library inventory. Users with the help of OPAC get details about the availability of books required. On the other side, as and when the recommendations are received from the users, the librarian, with the help of library management software can reconcile the collection to know about the availability status of the book in the library.

6. Information Literacy

Information Literacy has become very supporting with the help of application IoT. Now a day, Libraries record or provide pre-recorded training sessions about the usage of the library collection, including print as well as digital resources. These sessions are cashed on the library websites, and the links are circulated to the users on social media compatible with mobile applications. A mobile app has become very common for facilitating library services now a day. Generally, the libraries, with the help of a display unit, show recorded literacy programme at the entrance or waiting area for its outreach.

7. Appliance Management

Appliance management is another essential function of a library which may be controlled with the help of IoT. It is related to opening timings and closing timings of the library. The library has several appliances in the library premises. It is required to manage the lighting system in various areas of the libraries. OPAC kiosk, printers, scanners and computer terminals may be controlled for better utilization for users with minimum wastage of energy and other resources involved.

8. Conclusion

Development of information and communication technology has impacted on human life. Not only education and business, but ICT also plays a more significant role in the general and routine life of humans. The term Internet of Things was commenced in use when the electronic objects were attached with internet with computer-based programming enabled chip for performing everyday tasks for increasing enhancement and speed of performance of work done. Libraries to perform their routine functions on IoT technology-based equipment. It includes accessing libraries with the help of smart cards, circulations of documents and up keeping of inventory or stock of the library books and other documents. Prevention of theft of physical documents, identification of users, reservation of books and recalling of books already issued, tracking or tracing of books placed on shelves or out of library for any purpose, collection development and management of library documents, facilitating information literacy and maintenance of appliances used in the libraries are the major tasks performed with the help of IoT in the libraries.

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How Information Literate is the Millennial Social Science Researchers in the Digital Age? An Empirical Assessment

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1. Introduction

The Digital age is characterized by rapid advancements in information and communication technologies (ICT) and the availability of abundant information in multiple forms and formats. Navigating through the vast amounts of information on the web is generally confusing and often overwhelming task (D'Couto & Rosenhan, 2015). The majority of researchers today are from the "millennial" (Allison, 2013; Becker, 2012; Taylor, 2012) generation exposed to ICT and the Internet from a young age. They may have sound technological understanding to manage and use different devices, many a time they do not exactly understand what, where and how to locate, search and retrieve precise and relevant information required from all the sources available to them (Bloom & Deyrup, 2012). For millennial researchers, convenience is a major factor (Connaway et al., 2011). They are habitual of effortless access to an enormous amount of information and are generally reluctant to invest significant effort and time to locate, search and retrieve required information (D'Couto & Rosenhan, 2015; Becker, 2012; Taylor, 2012). For information requirements, they would rather prefer the Internet, using search engines like Google, than efficiently searching and retrieving information from academic databases (Greenberg & Bar-Ilan, 2014) which are more complex. Sometimes they also lack critical thinking skills (Breivik, 2005) while accessing information to differentiate between reliable and unreliable sources of information.

Researchers today are information privileged (Hare & Evanson, 2018). The huge "collection of information is strategically important to a scholar's research work and, by nature, requires complete interaction with the information" (Du & Evans, 2011), making information literacy (IL) skills crucial for success in the digital age.

The term 'Information Literacy' broadly refers to a set of skills and understandings that enables an information literate individual to successfully operate in new information environment by recognizing and understanding information needs, identifying and locating suitable information resource to meet the needs, evaluating the information in terms of its authenticity and reliability, and using the information

ethically and effectively. IL skills are essential for academic and research survival and lifelong learning. It is "a basic human right in the digital world" that "empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals" (IFLA, 2005). According to Koneru (2010) IL "is the competency that empowers one with the required knowledge about information, its nature, and available formats; skills to fetch the relevant information by sifting the irrelevant, and attitude for consuming and sharing information, by ethical means and practices". Thus, IL is a skill, ability, expertise, capability and competency of a person that enables him to locate and retrieve relevant and authoritative information from multiple sources.

2. Information Literate Persons

Zurkowski (1974) was the first to use the term "information literacy" to describe the information literate individual having necessary "techniques and skills". According to Paul Zurkowski, "People trained in the application of information resources to their work can be called information literates. They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in molding information – solution to their problems." An information literate individual is able to determine the extent and articulate his specific need for information, possesses a good understanding of his information environment, knows how to interact with different forms and formats of information, and is able to use the information to fulfill his information need in an ethical manner. The American Library Association (1989), Presidential Committee on Information Literacy: Final Report says that "Information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning because they can always find the information needed for any task or decision at hand." An information literate individual recognizes the different levels, types, and formats of information and their appropriate uses.

3. Review of Literature

In the rapidly changing new information environment periodic assessment of IL skills and abilities of millennial researchers have assumed greater importance. It "can relate to teaching or to the level of information literacy of the student, or it can be directed to a set of standards and outcomes, to library instruction programs, etc" (Baldwin, 2008).

Brown & Niles (2013) offered the most comprehensive review of the IL assessment research, compiling a critical bibliography of 90 research studies assessing information literacy published after 2007. Schilling & Applegate (2012) reviewed IL assessment methods in use during 2007-2012. Indicating the pros and cons of each method used, researchers identified the popular methods and demonstrated the "relationship between measures of attitudes, skills, and behavior". Julien, et al. (2018) conducted an online survey of academic librarians engaged in providing IL instruction in the US to get an insight into their practices and challenges. The focus of the study was pedagogical methods used; target audience; inclusion of technology in instruction; assessment and evaluation methods used; common challenges faced; and collaboration among faculty, administration, and librarian. It aimed to provide the best practices in these areas. The study by Pinkley & Hoffmann (2017) outlines the evolution of the IL assessment process at California State University Library with a specific focus on the 2013 assessment project. The primary goal of the assessment process has been to find the value of the library in translating the IL assessment findings in actionable results and improve library IL services.

There are a number of assessment methods like standard classroom tests based on multiple choices, fill-in-the-blanks, and matching questions. Assessment can also be carried out in the form of pre-instruction and post-instruction testing. It can be a survey seeking students' opinions to grade their own skills and competencies. Many a time it is in the form of 'Online Tutorial' having self-testing module or it can be an instrument in which instruction is embedded. The study conducted by Williams (2017) enumerates specific strategies being used in IL activities at Belk Library, Appalachian State University in the qualitative and quantitative measurement of student learning outcomes. It suggests possible IL methodologies, data measurement tools for assessment and assessment of student learning into the curricula of academic institutions.

The present study is an attempt to assess the information literacy competency (ILC) of millennial researchers. It also attempts to identify and establish levels of information literate researchers within and across different social science subjects and universities. The study findings are supposed to be of immense help to all the stakeholders to plan and execute various IL and other information skill enhancement activities and ultimately enhance levels of information literate individuals.

4. Purpose of the Study

To assess researchers' ILC level across different institutions and subjects for Information need; Information access; Information evaluation; Information use and Information use ethics.

5. Research Hypothesis

H_{01}: There will be no significant difference in the ILC levels of researchers from different universities and subjects for '*Information Need*'.

H_{02}: There will be no significant difference in the ILC levels of researchers from different universities and subjects for '*Information Access*'.

H_{03}: There will be no significant difference in the ILC levels of researchers from different universities and subjects for '*Information Evaluation*'.

H_{04}: There will be no significant difference in the ILC levels of researchers from different universities and subjects for '*Information Use*'.

H_{05}: There will be no significant difference in the ILC levels of researchers from different universities and subjects for '*Information Use Ethics'*.

6. Scope of the Study

The present study attempts to assess the ILC level of researchers enrolled for Ph.D. in the Department of History, Political Science, Economics, Sociology, Geography and Law at University of Delhi (DU), Jawaharlal Nehru University (JNU), Jamia Millia Islamia (JMI) and Indira Gandhi National Open University (IGNOU). The total population consisted of 3443 full-time researchers. The true representative sample was drawn on a 95% confidence level and 4% confidence intervals. The sample size of 511 was decided using the online sample size calculator of the Creative Research System (2012) of the American Marketing Association. A higher sample population of 520 was selected for the study. The study is limited to the social science research scholars on the roll during 2015-17 and is based on the responses received from 520 respondents.

7. Study Methodology

A questionnaire method has been used to collect relevant data. A schedule of 50 questions was framed on the basis of "*Information Literacy Competency Standards*

for Higher Education" (ACRL, 2000). Five key concepts viz: Information Need, Information Access, Information Evaluation, Information Use, and Information Use ethics were identified on five ACRL standards and transformed into a set of ten questions to measure the ILC levels of researchers. The responses were manually evaluated and 2 marks were allotted to each correct answer. Various techniques of descriptive and inferential statistics were applied for the analysis of the data. The descriptive statistics included frequency distribution, percentage, bar graph, etc and was aided by computing mean, standard deviation and range. Inferential statistics consisted of various tools like One-way ANOVA, F-ratio, and Post-Hoc test using LSD. To measure the ILC levels of respondents, the following Performance and Competency Scale was used (Singh & Kumar, 2019).

Table 1: Seven Point Performance and Competency Scale

Percentage of Marks	Grade	Performance Grading	Competency Level
91 and above	'O'	Outstanding	Outstanding
81 to 90	'E'	Excellent	Excellent
71 to 80	'A'	Very Good	Very Good
61 to 70	'B'	Good	Good
51 to 60	'C'	Fair	Baseline
41 to 50	'D'	Below Average	Minimal
Below 40	'F'	Failed/Not Responded	Very Low

In above table 'Outstanding' Level denotes that ILC development is above the requirements, 'Excellent' denotes that ILC development clearly meets the requirements, 'Very Good' denotes that ILC development meets the requirements, 'Good' denotes that ILC development meets the requirements but to a limited extent and 'Baseline' to 'Very Low' denotes that ILC development is below the requirements.

8. Profile of Respondents

The present study measures IL levels of the researchers enrolled for Ph.D. in select Central Universities. The detail of respondents with respect to the subject area of research and institution is presented in Table 2.

Table 2: Profile of Respondents

University Enrolled History Political Science			Subject Area of Research						Total
			Economics	Sociology	Geography	Law			
	DU	Number	20	20	20	20	20	22	122
		Percentage	16.4%	16.4%	16.4%	16.4%	16.4%	18.0%	100.0%
	JMI	Number	20	28	16	16	20	20	120
		Percentage	16.7%	23.3%	13.3%	13.3%	16.7%	16.7%	100.0%
	JNU	Number	22	24	22	24	24	26	142
		Percentage	15.5%	16.9%	15.5%	16.9%	16.9%	18.3%	100.0%
	IGNOU	Number	24	24	36	24	14	14	136
		Percentage	17.6%	17.6%	26.5%	17.6%	10.3%	10.3%	100.0%
Total		Number	86	96	94	84	78	82	520
Percentage		16.5%	18.5%	18.1%	16.2%	15.0%	15.8%	100.0%	

9. Results and Discussions

The results and discussions on respondents' test performance grade and ILC level are presented key concept-wise.

Information Need

Determination of extent and articulation of information need; identifying the form and format as well as places and sources of precise and relevant information needed is quite essential to successfully operate in the digital information environment. The details of the test score of researchers across universities are presented in Table 5 and across subjects in Table 6. Out of the total 520 respondents, 20.8% were outstanding performers with 20 marks, 24.6% were excellent performers with 18 marks, and 16.2% were both very good performers and good performers with 16 and 14 marks respectively. The rest of the respondents consisted of 10.8% fair performers scoring 12 marks, 7.7% below average performers scoring 10 marks and 3.8% of the respondents failed the ILC assessment test on '*Information Need*'.

Table 5: Assessment on Information Need- Across Universities

University		Grade and Marks							
		'O' 20	'E' 18	'A' 16	'B' 14	'C' 12	'D' 10	'F' 8 or Less	Total
DU	Count	6	26	24	22	16	14	14	122
	% within University	4.9%	21.3%	19.7%	18.0%	13.1%	11.5%	11.5%	100.0%
JMI	Count	14	28	20	28	18	8	4	120
	% within University	11.7%	23.3%	16.7%	23.3%	15.0%	6.7%	3.3%	100.0%
JNU	Count	64	26	14	16	14	6	2	142
	% within University	45.1%	18.3%	9.9%	11.3%	9.9%	4.2%	1.4%	100.0%
IGNOU	Count	24	48	26	18	8	12	0	136
	% within University	17.6%	35.3%	19.1%	13.2%	5.9%	8.8%	0.0%	100.0%
Total	Count	108	128	84	84	56	40	20	520
	% within University	20.8% 24.6%	16.2%	16.2%	10.8%	7.7%	3.8%	100.0%	

Table 6: Assessment on Information Need- Across Subjects

Subject Area of Research		Grade and Marks							
		'O'4 16	'E' 16	'A' 16	'B' 14	'C' 12	'D' 10	'F' 8 or Less	Total
History	Count	16	20	12	16	8	10	4	86
	% within Subject	18.6% 23.3%	14.0%	18.6%	9.3%	11.6%	4.7%	100.0%	
Political Science	Count	16	24	21	10	10	10	5	96
	% within Subject	16.7% 25.0%	21.9%	10.4%	10.4%	10.4%	5.2%	100.0%	
Economics	Count	34	24	12	12	11	1	0	94
	% within Subject	36.2% 25.5%	12.8%	12.8%	11.7%	1.1%	0.0%	100.0%	
Sociology	Count	12	26	17	18	8	0	3	84
	% within Subject	14.3% 31.0%	20.2%	21.4%	9.5%	0.0%	3.6%	100.0%	

Geography	Count% within Subject	8 10.3% 23.1%	18 16.7%	13 23.1%	18 14.1%	11 10.3%	8 2.6%	2 100.0%	78
Law	Count % within Subject	22 26.8% 19.5%	16 11.0%	9 12.2%	10 9.8%	8 13.4%	11 7.3%	6 100.0%	82
Total	Count	108	128	84	84	56	40	20	520
	% within Subject	20.8% 24.6%	16.2%	16.2%	10.8%	7.7%	3.8%	100.0%	

On the competency scale 77.7% of the respondents consisting of 20.8% 'Outstanding', 24.6% 'Excellent', 16.2%' Very Good' and again 16.2%'Good' were found information literate to determine the extent and articulate information need. It included a maximum of 23.1% of respondents from JNU closely followed by 22.3% from IGNOU, 17.3% from JMI and 15.0% from DU. Subject wise it included a maximum of 15.8% of respondents from Economics followed by 14.0% from Sociology, 13.7% from Political Science, 12.3% from History and 11.0% from both Geography and Law. The rest 22.3% of the respondents consisting of 10.8% 'Baseline', 7.7% 'Minimal' and 3.8% 'Very Low' were not information literate. It included maximum 8.5% respondents from DU followed by 5.8% from JMI, 4.2% from JNU and 3.8% from IGNOU and subject wise maximum 4.8% respondents were from both Political Science and Law followed by 4.2% from History, 4.0% from Geography, 2.3% from Economics and only 2.1% from Sociology. The finding of the study clearly exhibits the inefficiencies of researchers. Previous studies by Gross & Sheridan (2011) and Dalal, et al., (2015) reported that most of the respondents were not able to use appropriate keyword and failed to precisely articulate their information needs.

Statistically, the researchers from JNU scored a higher mean score of 17.18, followed by IGNOU with a mean score of 16.38, JMI with a mean score of 15.20 and DU with the lowest mean score of 13.93. The overall mean score is 15.75. Across subjects, researchers in Economics scored a higher mean score of 17.17, followed by Sociology with a mean score of 15.95, Political Science with a mean score of 15.50, Law with a mean score of 15.44, History with a mean score of 15.40 and Geography with a mean score of 14.87. The overall mean score is 15.75. The mean score and mean plots suggest that researchers at JNU across universities and in Economics across subjects were highly information literate followed by researchers from IGNOU, JMI and DU, and Sociology, Political Science, Law, History and Geography.

Hypothesis Testing

One-way ANOVA was performed to examine the difference in concerned ILC levels of researchers across universities and subjects. The results are: **F(3, 516) = 22.853, p= 0.000** and **F(5, 514) = 4.457, p= 0.001**, respectively. The results indicate there were significant differences. Further, Post Hoc analysis using LSD was performed between the universities and subjects. It shows that there were significant differences in the ILC level of researchers in terms of 'Information Need' from different universities and subjects.

To sum up, the mean score and Post-hoc analysis of different universities and subjects for 'Information Need' is significant at the 0.05 level. Hence, the hypothesis stands rejected. Further, there were significant differences between Economics and History, Economics and Political Science, Economics and Sociology, Economics and Geography and Economics and Law.

Information Access

Researchers are the highest consumers as well as producers of Information. There is no dearth of information in the electronic information environment, it is available in plenty. The researchers need to possess a high level of information handling skills for precise and relevant information access from multiple sources and in different forms and formats. In terms of information access, the test performance of respondents across subjects was found to be very poor. The detail across universities is presented in Table 7 and across subjects in Table 8. Of the total 520 respondents, there were only 1.5% outstanding performers scoring 20 marks, 8.5% excellent performers scoring 18 marks, 17.7% very good performers scoring 16 marks, 26.2% good performers scoring 14 marks, 18.1% fair performers scoring 12 marks, 13.5% below average performers with 10 marks and 14.6% of the respondents failed the ILC assessment test on '*Information Access*'.

Table 7: Assessment on Information Access- Across Universities

University		Grade and Marks							Total
		'O' 20	'E'18	'A'16	'B'14	'C'12	'D'10	'F' 8 or Less	
DU	Count % within University	2 1.6%	6 4.9%	6 4.9%	22 18.0%	22 18.0%	20 16.4%	44 36.1%	122 100.0%

JMI	Count % within University	0 0.0%	4 3.3%	6 5.0%	26 21.7%	26 21.7%	30 25.0%	28 23.3%	120 100.0%
JNU	Count % within University	4 2.8%	24 16.9%	54 38.0%	32 22.5%	18 12.7%	8 5.6%	2 1.4%	142 100.0%
IGNOU	Count % within University	2 1.5%	10 7.4%	26 19.1%	56 41.2%	28 20.6%	12 8.8%	2 1.5%	136 100.0%
Total	Count % within University	8 1.5%	44 8.5%	92 17.7%	136 26.2%	94 18.1%	70 13.5%	76 14.6%	520 100.0%

Table 8: Assessment on Information Access- Across Subject

Subject Area of Research		**Grade and Marks**							**Total**
		'O' 20	**'E' 18**	**'A' 16**	**'B' 14**	**'C' 12**	**'D' 10**	**'F' 8 or Less**	
History	Count % within University	0 0.0%	10 11.6%	20 23.3%	14 16.3%	14 16.3%	14 16.3%	14 16.3%	86 100.0%
Political Science	Count % within University	2 2.1%	0 0.0%	18 18.8%	27 28.1%	14 14.6%	16 16.7%	19 19.8%	96 100.0%
Economics	Count % within University	4 4.3%	11 11.7%	16 17.0%	32 34.0%	16 17.0%	7 7.4%	8 8.5%	94 100.0%
Sociology	Count % within University	0 0.0%	4 4.8%	14 16.7%	21 25.0%	26 31.0%	10 11.9%	9 10.7%	84 100.0%
Geography	Count % within University	0 0.0%	9 11.5%	6 7.7%	23 29.5%	16 20.5%	6 7.7%	18 23.1%	78 100.0%
Law	Count % within University	2 2.4%	10 12.2%	18 22.0%	19 23.2%	8 9.8%	17 20.7%	8 9.8%	82 100.0%

Total	Count % within University	8 1.5%	44 8.5%	92 17.7%	136 26.2%	94 18.1%	70 13.5%	76 14.6%	520 100.0%

On the competency scale, only 53.8% of the respondents were found information literate to access needed information effectively and efficiently. It included a maximum of 21.9% of respondents from JNU followed by 18.1% from IGNOU and 6.9% from both DU and JMI. From subjects, it included a maximum of 12.1% of respondents from Economics followed by 9.4% from Law, 9.0% from Political Science, 8.5% from History, 7.5% from Sociology and 7.3% from Geography. The rest 46.2% of the respondents were not information literate in information access skills. It included maximum 16.5% respondents from DU followed by 16.2% from JMI, 8.1% respondents from IGNOU and 5.4% from JNU and maximum 9.4% respondents from Political Science followed by 8.7% from Sociology 8.1% from History, 7.7% from Geography, 6.3% from Law and 6.0% from Economics.

The information access skill is very important in the digital age to retrieve relevant and precise information. The study has identified 46.2% of the respondents lacking information access skills. In the new information-rich environment, it is a concern for academic and research survival. Ferguson, et al., (2006) found students missing skills in Boolean operators, truncation and use of controlled vocabulary for precise and relevant information search. Johnson (2013) also discovered that in a single search box even a faculty member failed to appropriately use keyword and express information need; the faculty member was reluctant to alter search terms or try one of the library's subject-specific databases and reported to " just try Google" as his next step.

Statistically, the researchers from JNU scored a higher mean score of 15.04, followed by IGNOU with a mean score of 13.91, JMI with a mean score of 11.20 and DU with the lowest mean score of 10.69. The overall mean score is 12.84. Researchers in Economics have scored a higher mean score of 13.83, followed by Law with a mean score of 13.46, History with a mean score of 12.93, Sociology with a mean score of 12.69, Geography with a mean score of 12.31 and Political Science with a mean score of 11.81. The overall mean score is 12.84. The mean score and mean plots suggest that researchers at JNU across universities and Economics across subjects were highly information literate followed by the researchers at IGNOU, JMI and DU, and Law, History, Sociology, Geography, and Political Science.

Hypothesis Testing

One-way ANOVA was performed to examine the difference in the '*Information Access*' level of researchers across universities and subjects. The results are: **F(3,**

516) = 65.030, p= 0.000 and **F(5, 514) = 4.238, p= 0.001**, respectively. The results indicate there were significant differences. Further, Post Hoc analysis using LSD was performed between the universities and subjects. It shows that there were significant differences in the IL level of researchers in terms of 'Information Access' from different universities, except between DU and JMI and subjects.

To sum up, the mean score and Post-hoc analysis of different universities and subjects for 'Information Access' skill is significant at the 0.05 level. Hence, the hypothesis stands rejected. Further, there were significant differences between Political Science and History, Political Science and Economics, Political Science and Law; Economics and Sociology, Economics and Geography; Geography and Law.

Information Evaluation

Critical evaluation of information and its sources to identify and establish the authenticity and reliability of information is essential in the digital world. The researchers' skills and competency with respect to the evaluation of information and its sources were assessed. The details are presented across universities in Table 9 and across subjects in Table 10. Out of the total 520 respondents, there were 8.1% outstanding performers with 20 marks, 18.8% excellent performers with 18 marks, 18.1% very good performers with 16 marks, and 21.9% good performers with 14 marks. The rest 13.8% were fair performers scoring 12 marks, 8.5% below average performers with 10 marks and 10.8% of the respondents failed the ILC assessment test on '*Information Evaluation*'.

Table 9: Assessment of Information Evaluation- Across Universities

University Enrolled		Grade and Marks							Total
		'O' 20	'E' 18	'A' 16	'B' 14	'C' 12	'D' 10	'F' 8 or Less	
DU	Count	0	8	18	24	16	12	44	122
	% within University	0.0%	6.6%	14.8%	19.7%	13.1%	9.8%	36.1%	100.0%
JMI	Count	0	8	28	26	28	22	8	120
	% within University	0.0%	6.7%	23.3%	21.7%	23.3%	18.3%	6.7%	100.0%
JNU	Count	38	48	22	16	10	6	2	142
	% within University	26.8%	33.8%	15.5%	11.3%	7.0%	4.2%	1.4%	100.0%

IGNOU	Count	4 2.9%	34	26	48	18	4	2	136
	% within University		25.0%	19.1%	35.3%	13.2%	2.9%	1.5%	100.0%
Total	% within University	42 8.1%	98.8% 18.8%	94 18.1%	114 21.9%	72 13.8%	44 8.5%	56 10.8%	520 100.0%

Table 10: Assessment of Information Evaluation- Across Subjects

Subject Area of Research		**Grade and Marks**							
		'O' 20	**'E' 18**	**'A' 16**	**'B' 14**	**'C' 12**	**'D' 10**	**'F' 8 or Less**	**Total**
History	Count	6 7.0%	18	10	14	12	8	18	86
	% within Subject		20.9%	11.6%	16.3%	14.0%	9.3%	20.9%	100.0%
Political Science	Count	10 10.4%	21	8	21	19	11	6	96
	% within Subject		21.9%	8.3%	21.9%	19.8%	11.5%	6.3%	100.0%
Economics	Count	8 8.5%	16	32	16	13	3	6	94
	% within Subject		17.0%	34.0%	17.0%	13.8%	3.2%	6.4%	100.0%
Sociology	Count	2 2.4%	15	22	31	7	5	2	84
	% within Subject		17.9%	26.2%	36.9%	8.3%	6.0%	2.4%	100.0%
Geography	Count	6 7.7%	15	9	18	9	7	14	78
	% within Subject		19.2%	11.5%	23.1%	11.5%	9.0%	17.9%	100.0%
Law	Count	10 12.2%	13	13	14	12	10	10	82
	% within Subject		15.9%	15.9%	17.1%	14.6%	12.2%	12.2%	100.0%
Total	Count	42 8.1% 18.8%	98	94	114	72	44	56	520
	% within Subject		18.1%	21.9%	13.8%	8.5%	10.8%	100.0%	

Overall 66.9% of the respondents were found information literate to evaluate information and its sources critically for its reliability and authenticity. It included a maximum of 23.8% of respondents from JNU followed by 21.5% from IGNOU, 11.9% from JMI and 9.6% from DU. Across subjects, it included a maximum of 13.8% of respondents from Economics followed by 13.4% from Sociology, 11.5%

from Political Science, 9.6% from Law, and 9.2% from both History and Geography. The rest 33.1% of the respondents were not information literate in similar skills. It included maximum 13.8% respondents from DU followed by 11.2% from JMI, 4.6% from IGNOU and 3.5% from JNU and maximum 7.3% respondents from History followed by 6.9% from Political Science 6.2% from Law, 5.8% from Geography, 4.2% from Economics and 2.7% from Sociology.

Statistically, the researchers from JNU scored a higher mean score of 16.87, followed by IGNOU with a mean score of 15.09, JMI with a mean score of 13.13 and DU with the lowest mean score of 11.11. The overall mean score is 14.19. Across subjects, researchers in Economics scored a higher mean score of 15.09, followed by Sociology with a mean score of 14.83, Political Science with a mean score of 14.19, Law with a mean score of 13.98, Geography with a mean score of 13.59, and History with a mean score of 13.35. The overall mean score is 14.19. The mean score and mean plots suggest that researchers at JNU across universities and Economics across subjects were highly information literate followed by the researchers at IGNOU, JMI and DU and Sociology, Political Science, Law, Geography, and History.

Hypothesis Testing

One-way ANOVA was performed to examine the difference in '*Information Evaluation*' skill level of researchers across universities and subjects. The results are: **F(3, 516) = 79.295, p= 0.000** and **F(5, 514) = 2.792, p= 0.017**, respectively. The results indicate there were significant differences. Further, Post Hoc analysis using LSD was performed between the universities and subjects. It shows that there were significant differences in the ILC level of researchers in terms of 'Information Evaluation' from different universities and subjects.

To sum up, the mean score and Post-hoc analysis of different universities and subjects for 'Information Evaluation' is significant at the 0.05 level. Hence, the hypothesis stands rejected. Further, there were significant differences between History and Economics, History and Sociology, Economics and Geography, and Sociology and Geography.

Information Use

In the new information environment, information is available in abundance. The users of information, especially, the researchers should possess the necessary skills to effectively use the information to accomplish a specific purpose. The details of the test score of researchers across universities are presented in Table 11 and across subjects in Table 12. Out of the total 520 respondents, maximum of 28.5% of respondents were excellent performers with 18 marks, followed by

20.4% outstanding performers with 20 marks, 15.8% very good performers with 16 marks, and 11.5% good performers with 14 marks. The rest were 10.8% fair performers with 12 marks, 6.5% below average performers with 10 marks and 6.5% of the respondents failed the ILCC assessment test on '*Information Use*'.

Table 11: Assessment on Information Use- Across Universities

University		Grade and Marks							
		'O' 20	'E' 18	'A' 16	'B' 14	'C' 12	'D' 10	'F' 8 or Less	Total
DU	Count	12	28	12	6	20	22	22	122
	% within University	9.8%	23.0%	9.8%	4.9%	16.4%	18.0%	18.0%	100.0%
JMI	Count	4	16	28	30	24	8	10	120
	% within University	3.3%	13.3%	23.3%	25.0%	20.0%	6.7%	8.3%	100.0%
JNU	Count	52	56	18	12	4	0	0	142
	% within University	36.6%	39.4%	12.7%	8.5%	2.8%	0.0%	0.0%	100.0%
IGNOU	Count	38	48	24	12	8	4	2	136
	% within University	27.9%	35.3%	17.6%	8.8%	5.9%	2.9%	1.5%	100.0%
Total	Count	106	148	82	60	56	34	34	520
	% within University	20.4% 28.5%	15.8%	11.5%	10.8%	6.5%	6.5%	100.0%	

Table 12: Assessment on Information Use- Across Subjects

Subject Area of Research		Grade and Marks							
		'O' 20	'E' 16	'A' 16	'B' 14	'C' 12	'D' 10	'F' 8 or Less	Total
History	Count	18	28	8	10	4	10	8	86
	% within Subject	20.9%	32.6%	9.3%	11.6%	4.7%	11.6%	9.3%	100.0%
Political Science	Count	10	25	22	6	16	8	9	96
	% within Subject	10.4%	26.0%	22.9%	6.3%	16.7%	8.3%	9.4%	100.0%

Economics	Count	27	26	18	13	6	4	0	94
	% within Subject	28.7%	27.7%	19.1%	13.8%	6.4%	4.3%	0.0%	100.0%
Sociology	Count	18	29	12	16	4	2	3	84
	% within Subject	21.4%	34.5%	14.3%	19.0%	4.8%	2.4%	3.6%	100.0%
Geography	Count	17	15	11	13	12	4	6	78
	% within Subject	21.8%	19.2%	14.1%	16.7%	15.4%	5.1%	7.7%	100.0%
Law	Count	16	25	11	2	14	6	8	82
		19.5%	30.5%	13.4%	2.4%	17.1%	7.3%	9.8%	100.0%
Total	Count	106	148	82	60	56	34	34	520
	% within Subject	20.4% 28.5%	15.8%	11.5%	10.8%	6.5%	6.5%	100.0%	

There were 20.4% 'Outstanding', 28.5% 'Excellent', 15.8%' Very Good' and 11.5%'Good' scorers. Thus, on the competency scale overall, 76.2% of respondents were found information literate to use information effectively to accomplish a specific purpose. It included a maximum of 26.5% of respondents from JNU followed by 23.5% from IGNOU, 15.0% from JMI and 11.2% from DU. It included a maximum of 16.2% of respondents from Economics followed by 14.4% from Sociology, 12.3% from History, 12.1% from Political Science, 10.8% from Geography and 10.4% from Law. A fair total of 23.8% of respondents were not information literate in information use skills. It included a maximum of 12.3% of respondents from DU followed by 8.1% from JMI, 2.7% from IGNOU and 0.8% from JNU and maximum 6.3% respondents from Political Science followed by 5.4% from Law 4.2% from both History and Geography, 1.9% from Economics and 1.7% from Sociology.

Statistically, the researchers from JNU scored a higher mean score of 17.97, followed by IGNOU with a mean score of 17.06, JMI with a mean score of 13.93 and DU with the lowest mean score of 13.15. The overall mean score is 15.67. Similarly, researchers in Economics scored a higher mean score of 16.91, followed by Sociology with a mean score of 16.45, History with a mean score of 15.40, Law with a mean score of 15.34, Geography with a mean score of 15.18, and Political Science with a mean score of 14.69. The overall mean score is 15.67. The mean score and mean plots suggest that researchers at JNU across universities and in Economics across subjects were highly information literate followed by the researchers at IGNOU, JMI and DU and Sociology, History, Law, Geography, and Political Science.

Hypothesis Testing

One-way ANOVA was performed to examine the difference in '*Information Use*' skill level of researchers across universities and subjects. The results are: F(3, 516) = 61.163, p= 0.000 and F(5, 514) = 4.223, p= 0.001, respectively. The results indicate there were significant differences. Further, Post Hoc analysis using LSD was performed between the universities and subjects. It shows that there were significant differences in the ILC level of researchers in terms of 'Information Use' from different universities, except between DU and JMI and subjects.

To sum up, the mean score and Post-hoc analysis of different universities and subjects for 'Information Use' is significant at the 0.05 level. Hence, the hypothesis stands rejected. Further, there were differences between Economics and History, Economics and Political Science, Economics and Geography, Economics and Law, Sociology and Political Science and Sociology and Geography.

Information Use Ethics

IL skills to deal with information abundance and manage information in the ICT age having multiple similarity detection software and stringent legal provisions are highly important. The details of the test score of researchers across universities are presented in Table 13 and across subjects in Table 14. Of the total 520 respondents, 6.2% were outstanding performers with 20 marks, 28.5% were excellent performers with 18 marks, 26.9% were very good performers with 16 marks and 18.1% were good performers with 14 marks. The rest of the respondents were 10.4% fair performers scoring 12 marks, 3.8% below average performers with 10 marks and 6.2% of the respondents failed the ILC assessment test on '*Information Use Ethics*'.

University		Grade and Marks							
		'O' 20	'E' 18	'A' 16	'B' 14	'C' 12	'D' 10	'F' 8 or Less	Total
DU	Count	8	22	18	34	18	6	16	122
	% within University	6.6%	18.0%	14.8%	27.9%	14.8%	4.9%	13.1%	100.0%
JMI	Count	6	28	30	26	14	4	12	120
	% within University	5.0%	23.3%	25.0%	21.7%	11.7%	3.3%	10.0%	100.0%

JNU	Count	8	60	36	22	12	4	0	142
	% within University	5.6%	42.3%	25.4%	15.5%	8.5%	2.8%	0.0%	100.0%
I G - NOU	Count	10	38	56	12	10	6	4	136
	% within University	7.4%	27.9%	41.2%	8.8%	7.4%	4.4%	2.9%	100.0%
Total	Count	32	148	140	94	54	20	32	520
	% within University	6.2% 28.5%	26.9%	18.1%	10.4%	3.8%	6.2%	100.0%	

Table 14: Assessment on Information Use Ethics - Across Subjects

Subject Area of Research		**Grade and Marks**							**Total**
		'O' 20	**'E' 18**	**'A" 16**	**'B' 14**	**'C' 12**	**'D' 10**	**'F' 8 or Less**	
History	Count	2	22	22	22	4	8	6	86
	% within Subject	2.3%	25.6%	25.6%	25.6%	4.7%	9.3%	7.0%	100.0%
Political Science	Count	6	24	31	17	12	2	4	96
	% within Subject	6.3%	25.0%	32.3%	a17.7%	12.5%	2.1%	4.2%	100.0%
Economics	Count	11	44	26	5	3	3	2	94
	% within Subject	11.7%	46.8%	27.7%	5.3%	3.2%	3.2%	2.1%	100.0%
Sociology	Count	6	24	25	11	8	0	10	84
	% within Subject	7.1%	28.6%	29.8%	13.1%	9.5%	0.0%	11.9%	100.0%
Geography	Count	3	10	21	23	19	0	2	78
	% within Subject	3.8%	12.8%	26.9%	29.5%	24.4%	0.0%	2.6%	100.0%
Law	Count	4	24	15	16	8	7	8	82
	% within Subject	4.9%	29.3%	18.3%	19.5%	9.8%	8.5%	9.8%	100.0%
Total	*Count*	32	148	140	94	54	20	32	520
	% within Subject	6.2% 28.5%	26.9%	18.1%	10.4%	3.8%	6.2%	100.0%	

Thus, on the competency scale, 79.6% of the respondents consisting of 6.2% 'Outstanding', 28.5% 'Excellent', 26.9%' Very Good' and 18.1%'Good' were found information literate to use information ethically and legally. It included a maximum of 24.2% of respondents from JNU followed by 22.3% from IGNOU, 17.3% from JMI and 15.8% from DU. It included a maximum of 16.5% of respondents from Economics followed by 15.0% from Political Science, 13.1% from History, 12.7% from Sociology, 11.3% from Law and 11.0% from Geography. The rest 20.4% of the respondents consisting of 10.4% 'Baseline', 3.8% 'Minimal' and 6.2% 'Very Low' were found lacking competency in information use ethics. It included a maximum of 7.7% of respondents from DU followed by 5.8% from JMI, 3.8% from IGNOU and 3.1% from JNU. It included a maximum of 4.4% of respondents from Law 4.0% from Geography, 3.5% from History, Political Science and Sociology and a minimum of 1.5% from Economics. The digital networking has garnered multiple information handling opportunities along with serious ethical challenges to humankind. The threats of abuse and misuse of information have come along with all the benefits of a digitally connected world (UNESCO, 2019).

Statistically, the researchers from JNU scored a higher mean score of 16.25, followed by IGNOU with a mean score of 15.88, JMI with a mean score of 14.73 and DU with the lowest mean score of 13.87. The overall mean score is 15.25. Similarly, researchers in Economics scored a higher mean score of 16.81, followed by Political Science with a mean score of 15.35, Sociology with a mean score of 15.12, History with a mean score of 14.74, Law with a mean score of 14.71, and Geography with a mean score of 14.49. The overall mean score is 15.25. The mean score and mean plots suggest that researchers at JNU across universities and in Economics across subjects were highly information literate followed by the researchers at IGNOU, JMI and DU and Political Science, Sociology, History, Law, and Geography.

Hypothesis Testing

One-way ANOVA was performed to examine the difference in '*Information Use Ethics*' skill level of researchers across universities and subjects. The results are: **F(3, 516) = 15.591, p= 0.000** and **F(5, 514) = 6.326, p= 0.000**, respectively. The results indicate there were significant differences. Further, Post Hoc analysis using LSD was performed between the universities and subjects. It shows that there were significant differences in the ILC level of researchers in terms of 'Information Use Ethics' from different universities, except between JNU and IGNOU and subjects.

To sum up, the mean score and Post-hoc analysis of different universities and subjects for 'Information Use Ethics' is significant at the 0.05 level. Hence, the hypothesis stands rejected. Further, there were significant differences between

Economics and History, Economics and Political Science, Economics and Sociology, Economics and Geography, and Economics and Law.

Findings

The major findings are:

- The study has found a significant difference in the ILC levels of researchers from different universities and subjects with respect to '*Information Need*', '*Information Access*', '*Information Evaluation*', '*Information Use*', and '*Information Use Ethics*'.

- It has been found that maximum of 79.6% of researchers on '*Information Use Ethics*', followed by 77.7% on '*Information Need*', 76.2% on '*Information Use*', 66.9% on '*Information Evaluation*' and only 53.8% on '*Information Access*' were information literate.
- The ILC levels of information literate researchers were different in different key concepts. On '*Information Need*' there were 20.8% 'Outstanding', 24.6% 'Excellent', 16.2% both 'Very Good' and 'Good' respondents; on *'Information Access'* there were 1.5% 'Outstanding', 8.5% 'Excellent', 17.7%'Very Good' and 26.2%'Good' respondents; on '*Information Evaluation*' there were 8.1% 'Outstanding', 18.8% 'Excellent', 18.1%' Very Good' and 21.9%'Good', respondents; on '*Information Use*' there were 20.4% 'Outstanding', 28.5% 'Excellent', 15.8%' Very Good' and 11.5%'Good' respondents; and on '*Information Use Ethics*' there were 6.2% 'Outstanding', 28.5% 'Excellent', 26.9% 'Very Good' and 18.1%'Good' respondents.
- The maximum 26.2% of researchers on '*Information Access*' followed by 21.9% of researchers on '*Information Evaluation*', 18.1% of researchers on '*Information Use Ethics*', 16.2% of researchers on '*Information Need*' and only 11.5% of researchers on '*Information Use*' have displayed only 'Good' level of ILC. These researchers, though could operate in digital information settings, essentially require to brush up their IL skills and improvise the ILC level.
- Researchers from JNU across universities and Economics across subjects were found to possess the highest IL skills and researchers from DU were found to have the lowest IL skills on all five parameters.

- A close analysis of the above findings reveals that maximum 46.2% of researchers on '*Information Access*' followed by 33.1% on '*Information Evaluation*', 23.8%

on '*Information Use*', 22.3% on '*Information Need*' and 20.4% on 'Information Use Ethics' were not found information literate.

Conclusions

The rapid technological developments having a far-reaching impact on the digital age have transformed "the ways in which users relate to and use information" (O'Gorman & Trott 2009). The digital information environment is very important in teaching, learning, and research. There is a "positive correlation between the use of electronic resources and strong academic performance" (Cox & Jantti, 2012). The doctoral students "frequently need comprehensive information, particularly for thesis research, and therefore need strong information seeking and use skills to accomplish their research goals" (Barry, 1997). Researchers need to develop proper ILC levels to work in new "information landscapes" (Lloyd, 2010). IL has emerged as an essential concern to make the researchers competent in IL to operate successfully in the digital environment. The onus is largely on libraries and information centers "to empower the students, researchers and faculty members to seek, evaluate, use and create information effectively and efficiently to achieve their educational, social, occupational and personal goals" (Singh & Kumar, 2018). The findings of the study may fruitfully be applied to structure and restructure IL plans and activities to inculcate the required skills among social science researchers and reap the benefits of the digital information environment.

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Extension Services in Public Libraries: With Special Reference to Ernakulam Public Library

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Abstract: TThe roles of libraries are changing with the user needs, especially in the digital era. The library strategies also should change to meet the requirements of the users. Library extension services can help extensively to achieve that goal. The study examines and analyses the Ernakulam public library's extension activities to know the flow of extension services and users' satisfaction in the services.

Keywords: Extension Services, Public libraries, Ernakulam Public Library, User needs

1. Introduction

The word "library" came from the Latin word 'liber' which means book. The term 'library' in English refers to a collection of books gathered for study, reference, research and recreation. A library is the memory of humankind and a critical link between users in present and future generation. It's the historical mandate to preserve knowledge and information and provide access to quality information resources and services promptly.

The trends adapted in the new digitalisation era have put forward many challenges to the librarians of this age. Social media and digital open-access contents have become the most popular resource platforms among the public. To keep the libraries relevant and self-sustainable, it should also change with the times, of which adding library extension services is a key aspect.

To go beyond the boundaries of the regular library system is one of the most straight forward descriptions for library extension services. The library should not wait for the public to come to the library, but the libraries should go out to the public. In this generation, innovative and digitalised library atmosphere changes are inevitable to meet the users' needs.

In the study, we discuss the various extension services offered by the Ernakulam public library, their limitations and suggest innovative ideas to improve the library services.

2. Literature Review

Debajit Borgohain and Rima Nath (2020) carried out the study "Public Library Extension Services as a Community Development Programme: A Case Study" to investigate various extension services practised by the public libraries in Upper Assam. It emphasises the awareness level about extension services among users and the problems libraries face while delivering public services.

Nikam, Khaiser and Jaya kumara (2014), in their paper "Opinion of Young Adults Towards Extension Activities of Public Libraries in Karnataka", examine the young adult's opinion towards extension activities of public libraries in Karnataka. The study purpose was to know the demographic characteristics of young adult public library (YAPL) users and their opinion about the shared library's academic and cultural activities.

Johannsen, Carl Gustav (2014) discusses the need for forward-thinking ideas in his study "Innovative Public Library Services – Staff less or Staff-intensive" to analyse whether the user communities' need for information will satisfy. The paper observes what tasks library leaders face and what they can do, and have done, to handle staff conflict and other related problems to the benefit of both users, the local communities, and the staff when introducing new and innovative services.

Balasubramanian, P (2012) enlightens the role of public libraries and explains how it helps to form a reading habit through his paper "A study on the extension activities of the District Central Library, Tirunelveli". The study also examines and analyses the information about different activities provided by District Central Library, Tirunelveli.

Kunkle, Hannah Josephine (1969) researched the historical study of the extension activities of the California state library (1850-1966). This study shows the relevance of changes in libraries that align with user needs and proves that extension services play a crucial part.

3. Objectives

- To study different extension services of Ernakulam Public Library.
- To analyse the impact of library extension services among users.
- To study applications of modern technologies used in extension services.
- To identify the limitations of library extension services in Public Library.
- To suggest innovative ideas to enhance library extension services.

4. Scope and Limitations of the Study

The purpose of extension services is to establish a healthy and informative relationship between the resources and the users. If the library extension service is organised effectively, it will increase the number of library users and increase the available resources. It is one of the best tools for marketing the library services and resources. It maximises user satisfaction and provides services to remotely located people who do not have academic library facility.

Ernakulam public library was established in 1870 and is the oldest and biggest library in Kerala. The library has more than 10000 members and can accommodate another 10000 more with over 1, 50,000 books in different Indian languages. The library has a collection of 47248 English Books,30665 Malayalam Books, 4777 Hindi Books,2891 Tamil Books, 200 Sanskrit books and 127 French Books. The library follows the open access system, allowing a person to choose any book that he/she wants by walking around the shelves. The library and reading room work seven days a week except on notified holidays from 10.00 am to 7.00 pm, and 8.00 am to 8.00 pm respectively.

The study focuses mainly on the extension services of Ernakulam public library include a) Mobile library, b) Reading to the illiterate, c) Reading circles for children, d) Reading circles for adults, e) Exhibitions, f) Cultural programmes, g) Talks on current topics, h) Seminars, i) Mini library system, j) Audio-visual media, k) Memorisation speech, l) Quiz programmes, m) Celebration of book week, n) Book reviews, o) Film shows.

The users and library staffs of the public library in Ernakulum were the participants of the study. The study focused only on the users of the public library in Ernakulum district. So, the outcomes of the study are only applicable to Ernakulam public library users. The result of the project may be inaccurate due to the lack of cooperation of the participants.

5. Methodology

The case study method was adopted to analyse the project. Interviews and questionnaires were the tools used to collect the required data. A structured questionnaire was designed and delivered randomly to Hundred persons in five different days, including the library staffs and users. Ninety-eight individuals responded to the questionnaire.

Analysis

The data analysed and processed using the feedback received from the questionnaires given to the users and staffs of the public library. The personal information of the respondents has not been revealed in the analysis, and the data are presented in the forms of tables.

Opinion about the extension activities of the library

The users' opinions about the extension services were analysed to know the views and responses. Users were given with the provision to express their opinion in five different options which are a) excellent, b) good, c) satisfactory, d) poor, e) no comments. More than 50% of users had an excellent opinion about all the extension services provided by the library.

Satisfaction in Conducting Library Extension Services

Satisfaction level in organising extension services was inquired to find out whether it meets with user requirements. 77.5% of users were satisfied with the frequency of conducting the activities.

Satisfaction in conducting library extension services	Number of respondents	Percentage
Yes	76	77.5%
No	22	22.44%

Causes of Dissatisfaction in the Extension Services of the Library

The investigation on the causes related to the dissatisfaction in the extension services queried shows that the dissatisfaction caused was mostly due to the lack of time and interest.

Causes of dissatisfaction in the extension services of the library	Number of Respondents	Percentage
Lack of time	13	59.09%
Lack of encouragement from the staffs	1	4.5%
Lack of training	1	4.5%
Lack of interest	4	18.18%
Unawareness about the extension services	2	9.09%
Others	1	4.5%

Services	Excellent		Good		Satisfactory		Poor		No comments	
	Number of users	Percentage (%)	Number of users	Percentage (%)	Number of users	Percentage (%)	Number of users	Percentage (%)	Number of users	Percentage (%)
Mobile library	55	56.12	24	24.48	6	6.12	11	11.22	2	2.04
Reading to the illiterate	50	51.02	17	17.34	20	20.40	7	7.14	4	4.08
Reading circles for children	52	53.06	24	24.48	12	12.24	8	8.16	2	2.04
Reading circles for adults	50	51.02	18	18.36	18	18.36	10	10.20	2	2.04
Exhibitions	56	57.14	20	20.40	17	17.34	4	4.08	1	1.02
Cultural programmes	51	52.04	18	18.36	20	20.40	7	7.14	2	2.04
Talks on current topics	55	56.12	21	21.42	9	9.18	10	10.20	3	3.06
Seminars	51	52.04	25	25.51	14	14.28	6	6.12	2	2.04
Mini library system	58	59.18	30	30.61	6	6.12	3	3.06	1	1.02
Audio-visual media	57	58.16	22	22.44	12	12.24	6	6.12	1	1.02
Memorization speech	52	53.06	23	23.46	16	16.32	5	5.10	2	2.04
Quiz programmes	54	55.10	21	21.42	12	12.24	8	8.16	3	3.06
Reading week celebration	50	51.02	21	21.42	16	16.32	9	9.18	2	2.04
Book review	58	59.18	26	26.53	10	10.20	2	2.04	2	2.04
Film shows	59	53.06	29	29.59	8	8.16	2	2.04	0	0.0

6. Findings and Suggestions

The library organises more than fifteen extension services in the library. The study reveals that users are delighted with the extension services organised by the Ernakulam public library. Users are so satisfied and interested in participating in the activities. More than fifty percentage users have rated excellent opinion on all the extension services organised by Ernakulam Public Library. Lack of time and interest are significant reasons for the dissatisfaction in the extension services among users. The satisfaction level of users on the activities shows the impact of the services among users. Still, the library should promote more digitalised extension services like a) Library blog, b) Remote access to the digital library contents, c) Library activity promotions through social media platforms, d) Online job fairs, e) Massive Open Online Courses

7. Conclusion

The libraries are the knowledge guides to the society; it is the library professionals' responsibility to initiate different extension activities to meet current user needs. Digitalised extension services can help the libraries to go to the users rather than they visit the library.

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Required Management Skills to Librarian Professionals to Manage the Academic Library

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Abstract: Every institution has the management to manage the institutions. For the successful implementation of plans they must be aware about the management skills. Library is a unit of the every institutions and librarian is a responsible person to manage the library. Because of the information explosion librarian became the more challengeable job for the librarian professionals. In order to satisfy need of users he has to manage the library. He has to manage the several employees working under the librarian professionals. For the successful librarian he must have managerial skill. In this research paper researcher has discuss about the required managerial skill.

Keywords: FLibrary professional, Management, Management Skill.

1. Introduction

Library and information centers became the responsible centers to deliver the correct information to the users. The aim of Library is not only provide information but provide the correct and valid information. To provide the information to the user library must be a unit and there must be a co-ordination, co-operation within the library. It is not a work of only the individuals. It is a team work. To be a successful librarian or to run the successful library librarian must have managerial skills. To accomplish this goal librarian must need to know the models, methods, techniques, tools, skills and knowledge of the management. He must have a vision of the future services is required. Managing that change is the most important characteristic of future focused, knowledge to the librarian. Since it is more important to create, organize, analyze, preserve and provide information in whatever format to fulfill the demands of the users. For that purpose librarian must have the managerial skills.

2. Objectives

1. To discusses about the management.
2. To finds out the required management skills for the librarian professionals.
3. To discusses about the required managerial skill useful to librarian professionals.

3. Scope

This research paper discuss about only the required management skill to the librarian.

4. Methodology

Present study intended to investigate the required management skills for the librarian. For this study researcher has studied the primary and secondary data.

5. What is Management?

The basic element of management is to achieve objectives through planning, organizing, staffing, leading, and controlling. According to, Mary Follett defined management as "the art of getting thing done through people." Further, James A. F. Stones defines management as "the process of planning, organizing, leading and controlling the efforts of organizational members and the use of other organizational resources in order to achieve stated organizational goals." It is very true. Management is not a part of alone. No one can manage it alone. It is a collective work. Managers need to use the skills and labor of others.

Resources Managers

There are various types of resources which librarians have to manage a manager. He has to spend large amount of time to manage a number of diverse resources. Mainly there are four types of resources controlled by managers.

Human Resources

All the employees including professional librarians, clerical workers, technical specialists having different levels of skills, experience and education working in the library or organization are the human resources. They are considered an essential part of the organization. Managers are in charge of the distribution of all of the human resources throughout an organization.

Financial Resources

Sources of funding are the financial resources of the library. Funding typically comes from donations by governments, grants or any other sources. Librarians in all kind of institutions are held accountable for the financial resources. It is expected that managers will play a role in securing grants.

Physical resources

Physical resources are the tangible and material parts of any organization. They consist of assets to the actual building where an organization functions. Libraries are located in spaces of institutions. Librarian or library managers are responsible for the proper management of all physical resources.

Information resources

Information resources are most important part of all institutions libraries. To provide information resources to the users is one of the prime parts of the managers or librarians. These resources were largely on paper. With the advent of computers, library of any institutions have constructed databases of information and these information is now available easily to any users through intranet. All these information resources should be managed by librarians. It is most important that manager must be ensuring the privacy and confidentiality of the material.

6. Required Skills for the Librarian Professionals as a Manager

According to Robert Katz, three managerial skills needed to successful management i.e. technical skills, human skills, and conceptual skills. Technical skills, relate to specific functions and tasks, to be an effective first-line manager librarian manager has to understand the process that is being carried out. It has been asked that what characteristics, abilities, and talents should possess librarian or manager of library. Managers or librarian need to have more conceptual skills and able to look at the picture of the institutions. The human skill is the ability to interact with people effectively. According to G. Edward Evans planning, staffing, fiscal management, innovation, motivation, communication, leadership, quantitative methods, ethics, decision making, delegation, and marketing are the needed skill of any managers or librarians. Nonetheless, following are the needed skill to librarians or library managers.

Political Skills

It is most important that managers or librarian of any institutions must have a vision and he must inspire others to believe in that vision. It is essential to him that he creates a climate beneficial to strategic thinking and action. There are various political issues relating to the organizations both internally and outside relating to their relationship to institutions. Since flexibility is required quality to maintain equity for the organization in the political environment.

Analytical Skills

Analytical skill is the most important part of the librarian or managers of library. He must be good at analysis. His analysis must be base on the insight. A clear, rational, well argued analysis is needed to develop the library. He must be a critical thinker. It is the key of successful management.

Problem-Solving Skills

Librarian or manager of the library has to face the lot of problem. It is the day to day activity of librarians or managers. Since, he must have developed the positive attitude. He must be a flexible. flexibility is also a key to success in modern institutions or library.

People Skills

Employees and users are the heart of every library. They have their own dimensions. As a manager librarian has to deal with these dimensions. Since, it is essential to the manager to handle each and every. He is responsible for the coordination of team and create cooperative environment in the library. For that purpose he needs to know communication skill, conflict resolution skills, and interpersonal skills.

Financial Skills

Librarians as a managers need financial skills. He must know all the sources of funds. He also aware about where funding comes from, where it goes and how to get it. He must have knowledge about how raise the funds for his library.

ICT Skills

Now a day library became the part of large system. Every library is becoming the global library. There is lot of electronic resources available through the internet on the computers. Since, he must be familiar with the computer. Computer based learning is became the essential part of the education and for the purpose to provide the information for the users he must be familiar with computer-based information systems.

Creative Thinking Skills

Thinking is a dynamic process and it can help to resolve the critical problem in the profession. Creative thinking provides innovative ideas to manage the library. Creative thinking develops new ideas to develop and manage the library and provide the information to the users effectively.

Leadership Skills

Librarian professional is a leader of the library. Leadership is a process to inspire others to achieve the required result. Effective leadership skills move the employees and the users in the right directions and motivate them to achieve their goals.

7. Conclusion

Librarian is not only a librarian. Librarian became the part of management is this way he is a manager of the library. He has to manage the every single thing in the library, for the purpose work as a librarian he must have the skills of manager.

8. Suggestions and Recommendations

Library plays an important role providing information to its clients. To provide correct information in the effective way to the user librarian professional must have the managerial skills. For the successful management of the library, librarian must follow the above managerial skill discuss in this paper.

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Impact of Digital Environment on Information Seeking Behavior of Post Graduate Students

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Abstract: The study examined and realized the behavior of research students towards the information, to examine the main sources of literature consulted by students, to determine students' awareness of the resources available to them. The present study is an effort to examine the information seeking behavior of the PG students of science students in KVNN Naik Arts, Commerce and Science College Nashik, Affiliated to Savitribai Phule Univesity of Pune. The survey method was used as a data collection tool with the help of pre-defined questionnaire during the month January 2020 to June 2020.There were 70 questionnaires distributed among PG students of science disciplines, out of which a total of 60 duly filled questionnaires were returned back with a response rate of 85.71%.

The findings revealed that application of ICT in libraries has greatly influenced the information seeking behavior of PG science students. The summary of findings revealed that there is use of information sources, awareness of digital information of the respondents, searching skills and satisfaction about quality of information. With the help of findings some concrete recommendations are listed in the conclusion of study.

KEYWORDS: Information Seeking Behavior, Electronic Resources

1. Introduction

Knowledge and information are vital for career growth and development. In the contemporary society, they offer a vast selection for the academic community in exacting. The increase in information on the Web has affected information seeking behavior. Information seeking behavior is a broad term, which involves a set of actions that an individual takes to communicate information needs, seek information, evaluate and choose information, and finally uses this information to satisfy his/her information needs. The environment in which the user operates, users "skills in identifying the needed information, channels and sources preferred for acquiring information, and barriers to information. Sufficient knowledge of the information needs of users is imperative for libraries in re-orienting their collections, services and activities to synchronize them with the information seeking behavior of their patron.

2. Literature Review

The literature is classified in three groups; digital information resources, information needs, and digital information seeking behavior o various disciplines.

3. Digital information Resources

There are various researches have been conducted on the use of digital information resources by different researchers around the world. In **2013 Gakibayo et al**. carried out a study at Mbrarar University Library Uganda regarding the use of digital information resources by university students. Results were tabularized and it shows that a large number of respondents were aware with the full use of technology in utilizing digital resources. The above research results ascertained that the use of digital resources in Mbrara University is frequent but to make their research more effective and useful they need advanced training for using digital resources.

Information Needs

Kumari (1997) conducted a research on the information use pattern of Ph.D. research scholars in pure science subjects of the University of Kerala. Approximately all the research scholars are agreed that the foreign research journals collection must be improved. The research revealed that 40% of the research scholars have publications. Research scholars are aware of the indexing and abstracting periodicals in their subject and they greatly make use of these for their research work. Information needs and seeking of research scholars varies from subject to subject. The information sources like supervising teachers, fellow researchers, conferences etc.

Digital Information Seeking Behavior

Wang (2007) wrote about disciplinary and cultural differences among information seekers in the Internet age, concluding that there are distinctions across disciplines and cultures in terms of how they rank the importance of these resources and how much they use them. Wang further discussed the information needs, information-seeking behaviors, and resource use of selected special interest group.

Scope

The study was limited to all post graduate science students in KVNN, ACS College Nashik Affiliated to Savitribai Phule Univesity of Pune.

Methodology

The study was conducted through questionnaire based survey method. The questionnaire was personally distributed to the students, from the Department of Physics, Chemistry and zoology at KVNN Naik College. The questionnaires were distributed 70 students out of which 60 filled in questionnaires were returned by the students with the response rate of 85.71%.

Following Methods were adopted in selecting the sample for conducting this study.

Research Design:	Descriptive research
Sampling Method:	Convenience sampling
Geographical Area:	Nashik (One College) KVNN Naik Arts, Commerce and Science College
Sampling Frame:	PG students (Physics, Chemistry, Zoology)
Sampling Period:	Jan 2020 to Dec 2020.
Sample Size:	60
Data collection Methods:	Bothe primary and secondary data
Instrument Need in Collecting Data:	Structured Questionnaire
Statistical tools:	Percentage analysis paragraphs and diagram

Data analysis and Interpretation: The information given by Post Graduation students is systematically analyzed and presented in successive paragraphs and diagram.

Table 2. Type of sources respondent's read-

Sr. No.	Sources Read	No. of Respondents	Percentage
1	Printed Reference sources	30	50%
2	Journal	10	16.66%
3	News paper	20	33.34%
4	E-Books	12	20%
5	E-Journal	16	26.66%
6	Both Print and Electronic	38	63.33%

Table no **1** shows that 30 (50%) P.G. Science students use printed reference sources. 10 (16.66%) students use magazines and 20 (33.34%) students use news

paper, 12 (20%) use E books, 16 (26.66%)students used e- Journal, 38 (63.33%) use both print and electronic material in library. In students searching behaviour the printed sources is more used than e-resources. In information communication, Selection, Coordination, and search the electronic sources swiftly useful; for understanding this library orientation programme should be more developed..

2. Preference of using search engines for accessing e-resources- The respondents are asked regarding which search engine they prefer to search electronic information resources. The data collected has been presented in the form of table. Table 10.C:03. Depicts that 26(43.33%) PG students are using Google search engine, 12(20.00%) are using Yahoo, 11(18.33%) PG students are using Alta Vista, 04(7.00%) are using Bing search engine, MSN search engine using 04(7.00%) PG students and 03 (5.00%) of respondents use other search engines for accessing required information resources through internet. The Google search engine is the influential search engine among the students so they effectively use it. Most of the students are unaware about these search engines this information should be reached towards them.

Table 2. Preference of using search engines for accessing e-resources

Sr. No.	Search Engines	No. of Respondents	Percentage
1	Google	26	43.33%
2	Yahoo	12	20.00%
3	Alta vista	11	18.33%
4	Bing	04	7.00%
5	MSN	04	7.00%
6	Others	03	5.00%

Preference of using Search Engines for Accessing e-resources

Maximum students use Google search engine for seeking information

Table 3. Availability of E-resource and level of Satisfaction about library

Sr. No.	Availability of E-resource and level of Satisfaction about library	No of Respondents	Percentage
1	Completely satisfied	**35**	**58.33%**
2	Fairly satisfied	**25**	**42.66%**

35 (58.33%) percentage students fully satisfied e- resources available in the library. 30 (50%) respondent's fairly satisfied e- resources available in the library.

Table 4. Purpose of using E-Resources

Sr. No.	Purpose of E-resources	Response	Percentage
1	For Academic Assignments	**20**	**33.34%**
2	For Learning to prepare for Exams	**12**	**20%**
3	To keep up-to date on Subjects of Interest	**14**	**23.33%**
4	For Career development	**14**	**23.33%**

The purpose, for which the e-resources were used by the students, as shown in Table-5, indicated that majority of the students, 20 (33.34 %) e-resources for preparing their academic assignments and for themselves updating on their subjects of interest. While 14 (23.33 %) students used e- resources for the purpose of career development and growth, followed by 12 (20.00%) students who used e-resources for preparing for examinations.

5. Problems in Accessing Electronic Resources: The students were asked to indicate the problems they encountered for accessing e-resources as shown in Table-5. The majority of the students, (42.00%) agreed that limited access to computers was the major problem for not able to use the e-resources, while (62.00%) students disagreed with using e-resources often distracts from work being the problem. (65.00%) students felt that too much information was the problem they faced while they accessed the e-resources.

Table 5: Problems in Accessing Electronic Resources

Problem	Agree (%)	Disagree (%)
Too much information is retrieved	65%	35%
Lack of IT knowledge and skills to effective utilize services	45%	55%
Using e-resources often distracts from work	38%	62%
Limited access to computers	42%	58%

Table-6 shows the areas of training as required by the students to access the e-resources. 42 (70.00%), the majority of the students, indicated that they required training for learning more about the Internet and search engines in order to access and make use of e-resources. Training in information retrieval skills got the attention of 54 (90.00%) students, while 24 (40.00%) students wanted to improve their OPAC searching. Overall, majority of the students indicated that they should be trained for accessing e-resources.

Table 6: Areas of Training Required

Areas of training required	Response Received	Percentage
Learning more about Internet and Search Engines	42	70%
Information Retrieval Skills	54	90%
OPAC Searching	24	40%

Findings and Suggestions- It was found that the students use search engines as a major source to access e-resources for their information needs and for the purpose of updating knowledge on their subjects of interest. In order to overcome the hindrances in accessing the e- resources, the study recommends awareness programmes for the students and to provide training on web searching and retrieval skills. The Internet has attracted the attention of the students as an easy source of accessing information and e-resources as is evident from the above study. Yet, only a sizeable number of students could frequently seek information from e-resources. Most of the students access e-resources for updating their knowledge on their respective subjects and for academic assignments. A majority of the students found that limited access to computers being the problem to use e-resources and indicated their willingness to get trained to learn more about using the Internet and e-resources.

Conclusion-Library should organized regularly awareness programmes for the students and to provide training on web searching and retrieval skills. College Libraries can influence students' information behavior by re-evaluating their instructional programmes and stipulation of resources and services.

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21st Century Digital Information Skills: Role of Libraries

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Abstract: It is an exploratory study of relevant literature to identify the information skills essential to operate in the digital landscape. Information skill is very much important for both users as well as information professionals. The Internet had made it easier to locate a large amount of information but the further process of analyzing, evaluating and using the accessed information has become much more difficult. This is what should be the focus of the information skills to be taught to the students and researchers. It recommends ways and means to effectively impart information skills particularly by libraries attached to institutions of higher learning and research.

Keywords: Digital Environment, Information Skill, Information Literacy, Information Need, Information Access, Information Evaluation, Information Use, Information Use Ethics

1. INTRODUCTION

The digitization of human knowledge and its worldwide networking at an exponential rate has opened up new horizons for information storage and dissemination. The creation, reproduction, transmission of and access to digital information are now effortless and instantaneous. The present digital information landscape facilitates ease and speed for information retrieval and use. It has become very important in teaching, learning, and research. Researchers today are information privileged and researches are mostly done on the Internet (Hare & Evanson, 2018). There is a "positive correlation between the use of electronic resources and strong academic performance" (Cox & Jantti, 2012). However, the digital information environment has given rise to multiple issues and challenges in information handling. The technological advancements having a far-reaching impact on digital information have transformed "the ways in which users relate to and use information" (O'Gorman & Trott, 2009). The threats of abuse and misuse of information have come along with all the benefits of a digitally connected world (UNESCO, 2019).

The term "information skills" was defined by Reitz as the ability and skills in finding and evaluating information, and refers to the awareness of and familiarity

with libraries' layouts, information resources, and common searching techniques Reitz (2010). It is a set of twenty-first-century learning skills that enables students to "use, transform, re-package, and communicate information". It is essential for thinking, working, and living in a digitalized world and has rightly been identified as pre-requisite skills for higher and lifelong learning (Binkley et al., 2012). It is an "individual's ability to use computers to investigate, create, and communicate in order to participate effectively at home, at school, in the workplace, and in the society" (Fraillon, Ainley, Schulz, Friedman & Gebhardt, 2014). "Information skills include information seeking, information use and information technology fluency" (Bundy, 2004). According to Reitz (2010), the level of mastery of information skills is to be reflected by the extent to which one can "critically evaluate information content", appropriately use it, and understand its "social, political and cultural context and impact".

Information skills have become a major factor in students' academic survival and success (Winship, 1995). According to Karim et al. (2018) "information search and use hold a key to knowledge building process in higher learning". Students possessing and using information skills to locate, retrieve, analyze and use the information and which largely help them to access the Internet are likely to succeed in their studies (Raubenheimer, 2014). According to Baji, Bigdeli, Parsa and Haeusler (2018) students "with abilities to evaluate and analyze appropriate information are likely to have competencies that help them in the formulation of research questions and in their ability to use information, as well as in understanding the ethical and legal issues surrounding information". As a result, higher educational institutions place an increasing emphasis on information skills training and most of the librarians feel that they have an enduring responsibility to provide information skills training using different formats. Previous studies of Binkley et al. (2012), and Siddiq, Scherer and Tondeur (2016) recommend that to ensure students' mastery of 21st-century skills both basic skills necessary to use digital tools and skills required to understand and use online content should be part of such training programs. Tewell, (2018), Chen, Sin, Theng and Lee (2015), Downey, (2016), and Bales, (2015) have outlined that "critical thinking and approach should be underpinned how information is used in any information-related behaviors and thinking". According to Rodríguez-de-Dios and Igartua (2016), and Rodríguez-de-Dios, van Oosten and Igartua (2018) for the digital natives of today, information and communication skills constitute necessary digital information skills.

2. Literature Review

It is falsely believed that students entering higher education possess a good level of digital and information skills necessary for success and survival. Previous researches by Hanson, Kilcoyne, Perez-Mira, Hanson and Champion (2011), Buzzetto-Hollywood (2017), Dixon (2017), Relles and Tierney (2013), and Mishra, Cellante and Kavanaugh (2015) show deficiencies in information handling skills among students. The study of Buzzetto-Hollywood (2017) focused on the information and digital skills, identified that new students in college have a rudimentary knowledge of computer fundamentals, possess a basic level of technology and information literacy, and are skilled in using social media, email, navigating the web and conducting basic online searches. The study found them deficient in the use of "core computer applications" for academic and professional productivity. Nataraj (2014) also recommended that "students do not develop the necessary technical skills in high school which must, therefore, be addressed by colleges early in the academic experience". Reading (2016) also found social science researchers struggling with "relevant basic competencies include searching for and finding resources, understanding resources, evaluating them in terms of scholarship and suitability to the question and referencing"

Multiple studies on information problem-solving such as by Brand-Gruwel, Wopereis and Walraven (2009), Claro et al., (2012), and van Deursen and van Diepen, (2013) found students skillful in locating information using digital tools and technologies. However, these students were found missing skills in identifying and defining information problems, planning effective search strategies and evaluation of information found in terms of reliability and authenticity. The study conducted by Ferguson, Neely, and Sullivan (2006) found students missing skills in Boolean operators, truncation and use of controlled vocabulary for precise and relevant information search. The study by Dalal, Kimura, and Hofmann (2015) reported that most of the respondents were not able to identify and make precise use of relevant keywords and failed to define their information needs and articulate the same. Johnson (2013) discovered that in a single search box even a faculty member failed to appropriately use keyword and express information need; the faculty member was reluctant to alter search terms or try one of the library's subject-specific databases and reported to " just try Google" as his next step. In the new information-rich environment, it is a concern for academic and research survival. The ability to retrieve precise and relevant information is important information access skills. Millennial researchers should be competent for precise information retrieval from a variety of sources. As Asher, Duke and Wilson (2013) state, "well-prepared students can effectively use a variety of search tools, while

poorly prepared students will likely struggle even with the best-designed tools". Further, researches by Walraven, Brand-Gruwel and Boshuizen (2008), Eynon, (2010), and Selwyn, (2016) have established that the new generation students will not develop required information skills without deliberate instruction.

Hence, there is an urgent need to identify the important information skills and elaborate on ways and means to impart these skills to the users of information. The purpose of the study is to explore the relevant literature, identify core information skills, and recommend ways and means to effectively impart information skills particularly by libraries attached to institutions of higher learning and research.

3. Digital Information Skills

The Internet had made it easier to locate a large amount of information but the further process of analyzing, evaluating and using the accessed information has become much more difficult, and this is what should be the focus of the information skills to be taught to the students and researchers. Critical thinking and problem-solving are information skills of a higher order and make the students to work effectively for their studies and later on in their professional lives.

Digital Information Skills are important and essential for survival in academics and research in the 21st century. According to Tsankov and Damyanov (2017) it is "important for education majors to have the ability to search, collect and process information and approach it critically and systematically as well as the skills to use the design tools for media information and the capacity to access, search and use Internet-based services, especially in the context of their future activities and opportunities for continuous professional qualification".

The systematic literature review of Van Laar, Van Deursen, Van Dijk and De Haan (2017) synthesizes the relevant literature on twenty-first-century digital information skills. The study provides a compendious framework and recommends seven core skills: technical, communication, information management, critical thinking, collaboration, creativity, and problem-solving. There are a number of information literacy standards and guidelines developed with the prime purpose to impart information skill literacy among the target audience. In most of these standards and guidelines, more focus is on the three basic components: information access, information evaluation, and information use. The study by Uribe Tirado and Castano Munoz (2012) presents a wonderful integration of information literacy standards and has identified similar digital information skills. Reviewing and analyzing various IL definitions, Bhimani, (2011) has identified

several skills or competencies and has categorized them into three key functions-finding, evaluating, and using. The Information Literacy Competency Standard for Higher Education (Association of College and Research Libraries [ACRL], 2000) is the most comprehensive and elaborate standard to date. Based on a scrutiny of ACRL Standards, new Framework, and related literature, the following specific information skills are identified

- Information Need
- Information Access
- Information Evaluation
- Information Use
- Information Use Ethics

3.1 Information Need

Information need is an understanding of what information is needed and why information is needed. In other words, it is concerned with what kind of information is required and for what purpose it is required. Also in case of a wide range of availability of information in relation to time, formats and geographical locations, what are various constraints or limitations to be associated while accessing and finding the information? It is concerned with the identification of sources available for exploitation, understanding various forms of resources (paper-based, electronic/digital, human, etc.), the merits and demerits of individual information resources and the explicit and implicit differences between them. In nutshell, information need is concerned with defining the information requirements and identifying the information resources and places of information.

In networked digital information landscape, while researchers may have the sound technological understanding to manage and use different devices, many a time they do not exactly understand what, where and how to locate, search and retrieve precise and relevant information required from various sources and in multiple formats available to them (Bloom & Deyrup, 2013). An assessment study conducted by Singh and Kumar (2018) found that 22.3% of researchers were lacking proper information skills to define, and determine the extent and articulate the information needed. The skills and abilities to identify and articulate precise information need is very important.

3.2 Information Access

Information access skills consist of expertise in methods and techniques to find relevant and precise information shuffling out the irrelevant. These skills are

necessary to glean information effectively from multiple sources. The user should be capable of how to find information efficiently and effectively from appropriate sources of information. They need to have an understanding of the extent to which information searching can be acquired. Different strategies are developed for this purpose. In addition to purposive searching, browsing, scanning, and monitoring information sources can be useful in acquiring the information. The user should have skills to use a variety of search engines e.g. individual and metasearch engines and construct different search strategies using Boolean operators.

In an era of easy access to information, learners should have complete control of the process and technique to access information. Navigating through the vast amounts of information on the web is generally confusing and often an overwhelming task (D'Couto & Rosenhan, 2015). The majority of researchers today are from the "millennial" (Allison, 2013; Becker Jr, 2012; Taylor, 2012) generation exposed to ICT and the Internet from a young age. They have become habitual in using technology in all walks of life in ways unknown to previous generations. They are also habitual of effortless access to an enormous amount of information and are generally reluctant to invest significant effort and time to locate, search and retrieve required information (D'Couto & Rosenhan, 2015; Becker Jr, 2012; Taylor, 2012). The assessment study of Singh and Kumar (2018) found that 46.2% of researchers were missing relevant skills and competency to efficiently access the information required for a specific purpose.

3.3 Information Evaluation

Users are bombarded with a variety of information available in multiple formats from varied sources. Information retrieved from the web using search engines is large in quantity and considerably varying in quality and relevance. Critical evaluation of such information in terms of authenticity and relevance is highly important (Brand-Gruwel & Stadtler, 2011). "Accessing and evaluating information" is described by Fraillon et al., (2014) as the "investigative processes that enable a person to find, retrieve, and make judgments about the relevance, integrity, and usefulness of computer-based information". Competency in information evaluation skills is highly important in teaching, learning, and research.

Previous studies of Biddix, Chung and Park (2011), Metzger and Flanagin (2013), and Blikstad-Balas (2016) found that students are habitual of convenience and when searching for information often use online digital information sources with no concern for relevance and reliability of digital information. Kubiszeqski, Noordewier and Costanza (2011) found great uncertainty in the editorial process and reviews of online digital resources and information. Further, Biddix et al.,

(2011), and Hatlevik (2016) found a discrepancy between the trust and use of online sources by students. Mason, Junyent and Tornatora (2014) found students facing difficulties in dealing with inconsistent web information and identifying the authentic and reliable websites. The assessment study of Singh and Kumar (2018) found that 33.1% of researchers were missing relevant skills and competency "to evaluate information and its sources critically and incorporate selected information into their knowledge base". Hahnel, Goldhammer, Krohne and Naumann (2018) found that reading skills affect the ability to evaluate online information.

The skill for critical evaluation of web information for its authenticity and reliability is essentially required to develop (Biddix et al., 2011), and for conducting evaluations students should be given appropriate training and instruction criteria (Mason et al., 2014). In the present context, where information is available in various forms and types of sources, evaluation of information for its "authenticity, accuracy, currency, value and bias" has become essential. This is an understanding of the information resources not only in terms of its capability to answer the question, but also its intrinsic trustworthiness. The students should be skillful to examine authority, objectivity, coverage, accuracy, and currency online information.

3.4 Information Use

Effective and efficient use of information is essential to accomplish a specific purpose. In this process new and prior information is applied in the process of planning and creation of a particular information product or performance. An individual having information use skills "organizes the content in a manner that supports the purposes; integrates the new and prior information, including summary, quotations, and paraphrasing, in a manner that supports the purposes; uses a range of information technology applications in creating the product or performance; communicates the product or performance effectively to others; communicates clearly and with a style that supports the purposes" (ACRL, 2000). In the networked digital information society librarianship has specifically recognized the need to inculcate skills and abilities in its users for effective information use. The skills and attributes of individuals able in the effective use of information are largely defined by professionals and professional bodies such as ACRL (2000), and Bundy (2004). Wai-yi (1998) equated effective use of information and IL and endorsed its importance in organizations as "essential to increase organizational competitiveness and profitability."

In the digital information society, effective use of information has become highly important. This importance has been recognized by Choo (1996), Kirk (2004),

and Abell and Oxbrew (2001). They have also studied the complex phenomenon related to effective information use from a variety of disciplinary viewpoints and focuses. Information use is explicitly related to convoluted tasks such as planning and decision making in management (Mintzberg, Ghoshal, Lampel & Quinn, 2003). The assessment study of Singh and Kumar (2018) found that 23.8% of researchers were lacking proper skills and competency in effective and efficient information use to accomplish a specific purpose in the new information environment. An individual having information use skills analyzes information properly to get accurate, authenticated research results to develop new areas of knowledge and research. Further, through proper analysis, he makes use of information for a comparative study and can also suggest limitations and constraints identified during the use of information.

3.5 Information Use Ethics

There are certain legal, logical, cultural and ethical responsibilities for using the information available in various forms and formats. Information use ethics refers to the ethics and responsibility of information use consisting of issues like unfair practice, fabrication, falsification and plagiarism; intellectual property rights, fair use, data protection and freedom of information. It could also encompass issues like code of practice and other ethical principles developed and accepted by the institutions and employees (Singh & Kumar, 2019). The term "information ethics" was first used by Robert Hauptman to examine the issue of morality concerning "information as a resource, a product, or as a target" (Joan, 2014). It has been defined as "the branch of ethics that focuses on the relationship between the creation, organization, dissemination, and use of information, and the ethical standards and moral codes governing human conduct in society" (Froehlich, 2020).

The assessment study of Singh and Kumar (2018) found that 20.4% of researchers were missing relevant skills and competency to understand economic, social and legal issues and use information ethically and legally. These researchers "have not learnt how to borrow and ethically use information available from different sources and in multiple formats. They are also not capable to follow norms and maintain the academic integrity". MacLennan (2018) identified a few challenges for students to avoid plagiarism. These include understanding the need for citation, synthesis of information and proper formatting of references. Gender differences in the awareness of plagiarism among students have been reported by Jereb, Urh, Jerebic and Sprajc (2018) and Singh and Kumar (2019). Both studies highlighted that female students have a better awareness of plagiarism than male students.

4. Role of Libraries

Academic libraries have an important role to play for the promotion of required competency in digital information skills essential for the 21st-century information landscape. The issues and challenges of information skills can be largely addressed through multiple IL activities. In the last four decades, academic librarians have expanded their role as information curators to embrace research and instruction within a broader notion of "information skills" (Rader, 2002) or IL (Pinto, Cordon & Díaz, 2010). IL has been proclaimed as a foundational literacy of the twenty-first century (Lloyd, 2011). It "helps in critical information analysis and balanced decision making paving the way for knowledge creation, learning, and innovation" (Forster, 2017). It is a vital and necessary competency among our millennial age "Google generation" students "having easy access to an abundant growth of questionable quality online information" (Foo, Majid & Chang, 2017).

IL has been described as a "set of modern skills needed to discover access, verify, and correctly interpret information in an age of abundant misinformation on the internet" (Parrott, 2018). The concept of information literacy has been used as an "umbrella term" that consists of concepts such as academic literacy, digital, media, and visual literacies, information skills, "information handling, data curation, and data management" (Moira & Stubbings 2011). Literacy of media and information is a skill or ability possessed by individuals in locating, accessing, retrieving, evaluating, and reproducing information. IL is a "multidimensional concept that includes maintaining and nurturing a positive attitude towards learning and assessing the veracity of information" (Parrott, 2018). It is the sum total of techniques, skills and capabilities essentially possessed by the information user for understanding all the aspects of information in a specific discipline ranging from the awareness of various forms and formats of information; the underlying differences among them; expertise to locate and access various information formats and retrieve the required information; establish the reliability and validity of information, and use the identified information ethically and communicate with rest of the world. It is essential for survival in the digital information age. It is a core instructional pedagogy in higher education and a basic human right in a digital world. Information users need to develop the required skills to work in new "information landscapes" (Lloyd, 2010). IL has emerged as an essential concern to establish an ethical foundation to promote "fair, equitable and responsible information use" practices.

Libraries should start a combination of IL activities to improve the existing information literacy competency level of the researchers. They should develop and maintain, with proper staff and other infrastructure facilities, a full-time

information literacy center/ cell/ unit. They should impart training to enhance skills for both computer and information handling (Balas, 2006; Ashley, Jarman, Varga-Atkins & Hassan, 2012). According to Rodríguez-de-Dios and Igartua, (2016), and Rodríguez-de-Dios, et al., (2018), both computer and information technology skills constitute an overarching digital information skill. It is not necessary that each library professional may possess higher information literacy competency. Thus, imparting training and education to such professionals through *Training the Trainer Program* at first hand is essential. Previous studies by Walton and Hepworth (2011) and Lloyd (2017) have shown that effective IL education and training can be provided by integrating it into the teaching and learning process. A credit-based and curriculum integrated *Information Literacy Course* is highly suggested. As per UGC Guidelines (2009), Ph.D. course work is an essential part of research programs in the Indian universities. IL content should essentially be incorporated in the Ph.D. course work. For the successful implementation of IL activities, a close collaboration between the teaching faculty and the library professionals is essential.

There is an enormous increase in the number of students across many institutions worldwide without a corresponding increase in infrastructure. The Internet has facilitated a strong platform for online academic activities. Learning online is considered as an effective and successful alternative to face-to-face instruction. Online delivery of instructions has emerged as both an efficient and sustainable method (Mery, Newby & Peng, 2012). A large number of teaching and learning tools and courses are available for various purposes. A variety of training programs and courses are being imparted online. The survey conducted by the University of Western Ontario found that there was a preference for online instruction (Hoffmann, Antwi-Nsiah, Feng & Stanley, 2008). Online tutorials should largely be used by libraries as an information skills enhancement tool for the academic community. It has been identified as the most common method for promoting IL in the UK (Ellis, Johnson & Rowley, 2017). Academic libraries may fruitfully utilize this platform and provide *Online Information Literacy Tutorials*. To address the needs of the academic community within the time limitations and other possible obstacles, academic libraries in India should develop specifically designed comprehensive *'Online Information Literacy Tutorials'*. Such online tutorials will have a far-reaching impact on developing all-round information skill competency. Besides, academic libraries may also develop and facilitate the use of other active and collaborative activities to online learning communities, such as chats, email, discussion forums, and other online communication tools. This will enable different types of learners to avail and make the best use of different types of information resources.

5. Role of Professionals

In the digital information landscape, the library and information profession has to shoulder added responsibilities to retain its value. It has developed numerous tools and methods to acquire, process, organize and disseminate information in physical format. The online digital format is different and has various advantages over physical format along with intrinsic challenges. The physical format is no more suitable to handle the exponential growth in research and scientific information. The online digital format is the need of the hour. The library and information professionals should proactively come forward and develop expertise and competency in digital information handling skills to serve the end-users. They ought to develop a thorough understanding of online information resources; expertise in information retrieval using available search tools; competence to differentiate reliable and unreliable information; technological skills with fluency in different digital channels for information dissemination; good understanding of research process; command over different citation styles to operate successfully in the digital information landscape.

6. Conclusion

In the present digital landscape, IL skills competency can't be developed without appropriate ICT skills. The 'Google Generation' students are largely digital savvy and use more advanced interactive digital technologies but lack IL skills. Studies have found such students missing critical thinking and cognitive skills and are incompetent in searching and finding appropriate materials for academic study. Many times they fail to evaluate the relevance and reliability of large amounts of information they find on the internet. The onus lies on the shoulders of libraries to impart and inculcate the IL skills and competency among its users. IL programs and activities need to be at the center of all teaching and learning strategies. Most of the IL programs and activities should be embedded in the curriculum to make it subject-specific. A close collaboration between teaching faculty and library professionals in designing the course curriculum will ensure holistic learning. Periodic IL skill assessments should be made to gauge the use of information resources and find out how learners demonstrate critical thinking, reading and writing skills. It must be ensured that the twenty-first-century digital information skills become an integral part of teaching, learning and research activities in higher education.

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Indian Cancer Research Data and its Mapping Through Innovative Techniques

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Abstract: Introduction: Researches on cancer around the world are conducting on a large scale to combat, protect and control this second leading disease-causing of death. As estimated by the World Health Organisation (WHO), 1 death in 6 is due to cancer worldwide. India is also found to give thrust on research in the field, as the research data shows. The present study is an attempt to map the cancer research data of the country using different innovative techniques. The main objectives are to survey and extract the research data of cancer in respect of India from Web of Science database by analysing growth productivity, types of communication, collaboration, highly cited papers, productive researchers, institutions, etc and to map and visualise the research data using different innovative techniques and tools.

Scope and methods: Indian cancer research data for the period 1989-2020 has been considered for the study based on the data available in Web of Science (WoS) Core Collection database. All Cancer and its related areas have been taken into account excluding early access data. Innovative techniques for analysis, interpretation, visualization and mapping of the data such as bibliometric techniques and software *bibliometrix* R-*package* Biblioshiny and VOSviewer have been used. Data has been presented in tabular form and network visualization mapping, as well.

Suggestions, Recommendations and Conclusion: The study provides us many clues on the researches undertaken in the area of cancer in India during the period of 31 years. WoS extracts 14,641 document types of cancer and its related areas of which the most cited articles are found to collaborate with researchers from other countries. The highest number of publication is found to be the research article. The journal 'Pediatric Blood & Cancer' is found to be the most relevant source for the publications. While AIIMS tops among Indian Institutions in research productivity. It is appropriate to mention here that the present study is limited to bibliometric analysis of the scientific literature on cancer contributed by India. A comparative study with scientific research outputs from other countries on the subject will enable us to understand the research trends in the global context. It is suggested that there is a need for encouraging collaborative research for improving early detection in cancer at the national and international levels.

Keywords: India, Cancer, WHO, Biblioshiny, VOSviewer, Bibliometrics

1. Background

Cancer is the second leading cause of death worldwide. According to the World Health Organization (WHO) in 2018 around 9.6 million deaths were estimated. Around 1 death in 6 is due to cancer worldwide. The WHO has also considered the dreaded disease "Cancer" as a large group of diseases that can start in virtually any organ or tissue of the body when abnormal cells develop beyond control and invade adjacent bodily parts or spread to other organs beyond their usual boundaries. National Cancer Registry Programme (NCRP) under the Indian Council of Medical Research (ICMR) has also considered Cancer as a disease of any age, gender, nationality, ethnicity, economic status, educational layers, geological and geographical distribution as a result of unregulated cell growth in any human organ system. In appearance, it may be acute, sub-acute, or chronic. According to Cancer Fact Sheets Report of 2020 by International Agency for Research on Cancer (IARC), an intergovernmental agency of WHO, 19,292,789 number of new cases were detected in 2020 and 9,958,133 number of deaths in 2020 of both sexes and all ages (International Agency for Research on Cancer (IARC), 2020). It emerges as a significant health issue and calls for a comprehensive study of research methods and applications to establish adequate control measures.

However, this dreaded disease is still not curable despite advancement in medical research. A large number of research and development programmes have been put into practice across the world by scientists. The day may not be far away to conquer cancer by the concerted efforts of scientific research in medical sciences. The quantum of research outputs in the field has been increased years after years amongst the countries. Metrics of such products provide us significant clues on the nature of the research, its trends and patterns, collaboration aspects, thrust areas, perspectives of an individual scientist and researcher, institution and country, scattering pattern, and avenues for the new research areas needed to be taken up and so on. Mapping of such recent data using innovative techniques can throw us light on the trends of the issues. India is also one of the contributing countries in their field of research. The present paper is an attempt in this regard to analysing the cancer research data of India for mapping by using different bibliometric tools and innovative techniques.

2. Review of Literature

Cancer research is found to be many as many researchers and scientists have focussed on the trends in the development of cancer. Liu *et al.* (2020) analysed the 1994 papers published on Chimeric Antigen Receptor (CAR) T-cell in the

field of cancer and explored global hotspots and prospects. The study conducted by Shi *et al.* (2020) on 100 top most-cited articles on exosomes in the field of cancer found that the top 100 articles published from the USA and Harvard University were found to be the most productive country and institution. While Schmutz *et al.* (2019) identified the global cancer research funding landscape of 4693 organizations from 107 countries. Again, Cabral *et al.* (2018) identified the most relevant journals, research areas, countries and research organizations on the cancer research outputs of the world. Again, Munnolli and Pujar (2017) identified prominent institutes that contributed to cancer research in India, major publication channels used and the impact of highly cited papers on social media. While studying the Indian contribution to breast cancer research by Ram (2017), it has been found that India has contributed 1.82% of articles on breast cancer and ranked 12th in the world in terms of research paper output. Santhanakarthikeyan *et al.* (2014) analysed the literature growth, author productivity and pattern, average length of articles and country collaboration of cancer research in India. Many studies had been conducted by different researchers (Glynn *et al.,*2010; Campbell *et al.,* 2010; Lewison *et al.*, 2010) on some key areas of cancer.

3. Objectives of the Study

The present study has been taken up with the objectives to:

a) Survey and extract the research data of cancer in respect of India from the Web of Science database.

b) Analyse the research data to understand the growth productivity, types of communication, highly cited papers, productive researchers, institution, sources etc.

c) Map and visualise the research data using different innovative techniques.

d) Assess the focused areas of research using keyword analysis.

4. Scope, Sample and Methods

The data for the present study has been searched, identified and downloaded from Clarivate Analytics Web of Science (WoS) Core Collection Database. The keywords provided by the Library of Congress Subject Headings (LCSH) and U.S. National Library of Medicine MeSH Browser has been used and searched

by using Title (TI) search i.e. "TI=(Cancers* OR Carcinoma* OR Malignancy* OR Adenocarcinoma* OR Adenoid cystic carcinoma* OR AIDS malignancies* OR Blastomas* OR Leukemia* OR Melanoblastoma* OR Melanoma* OR Renal cell carcinoma* OR Rhabdomyosarcoma* OR Sarcoma* OR Squamous cell carcinoma* OR Teratocarcinoma* OR Toxohormone* OR Benign-Neoplasms* OR Malignant Neoplasms* OR Neoplasia* OR Neoplasm* OR Tumors*) AND CU=(INDIA)" to identify and locate publications brought out from 1989 to 2020.

All Cancer and its related areas have been taken into account excluding early access data. Conducting such a search strategy, a total of 14,641 publications were retrieved from the WoS database. The data sources imported by using *bibliometrix* R-*package* Biblioshiny include 14,641 different types of documents from 1,684 sources having 222,437 references contributed by 29,268 authors. However, the appearances of these authors are found to be 84131. The retrieved data exported in plaintext (.txt) file format from the database is used as the data source. Innovative techniques for analysis, interpretation, visualization and mapping of the data such as bibliometric techniques and software *bibliometrix* R-*package* Biblioshiny (Aria & Cuccurullo, 2017) and VOSviewer (Van Eck & Waltman, 2009) have been used.

5. Cancer Research Data: A Bibliometric Profile

The profile of the studies concerning Cancer constitutes the main data source for the present study which are found in different types of documents. Table 1 represents the bibliometric profile on *Cancer* researches conducted by India during the period 1989-2020. As described, of the 14,641 documents considered for the study there are 353 Authors of single-authored and 28915 Authors of multi-authored documents. On the other hand, in author collaboration, there are 449 single-authored documents, and 0.5 documents per author, the authors per document constitute 2. Again, the rate of the co-authors per document is 5.75, while the collaborative index of all the 14641 papers being 2.04.

Table 1: Cancer Research Data (1989-2020)

Description	Results	Description	Results
Main Information About Data		Authors	
Timespan	1989:2020	Authors	29268
Sources (Journals, Books, etc)	1684	Author Appearances	84131

Documents	14641	Authors of single-authored documents	353
Average years from publication	9.04	Authors of multi-authored documents	28915
Average citations per documents	8.778	Authors Collaboration	
Average citations per year per doc	0.9182	Single-authored documents	449
References	222437	Documents per Author	0.5
Document Contents		Authors per Document	2
Keywords Plus (ID)	13964	Co-Authors per Documents	5.75
Author's Keywords (DE)	17237	Collaboration Index	2.04

5.1 Document Types

As regards the document types, the following figure 1 shows among the total 14,641 documents, 13 document types were retrieved by the Biblioshiny tool. The highest number of document type available is *Article* i.e. 8293 of the total publications followed by *Meeting Abstract (3572)*, *Letter* (1284), and so on. The lowest publications were from Review; Retracted Publication and News Item with only 1 publication each.

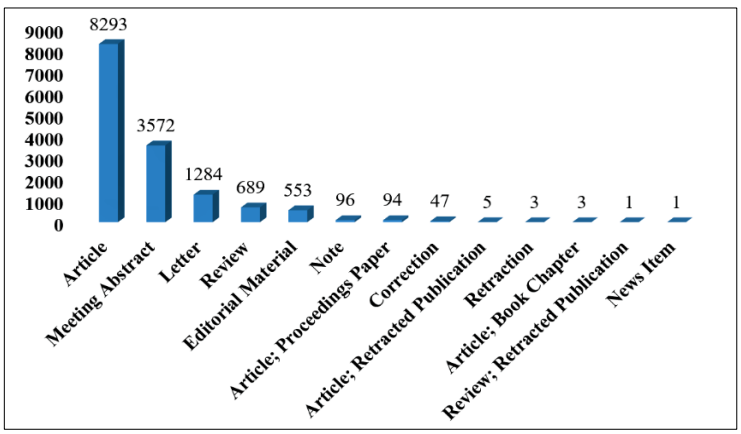


Figure 1: Types of Document

5.2 Growth Pattern

As illustrated in figure 2 below the publication trends in cancer research for the period of 1989-2020. The documents published in the year 2019 have received the highest number of publication with 1237 publication and the lowest figure

of (97) each was recorded for the articles published in 1989 and 1991. There is a trend of increasing the growth of publication by year.

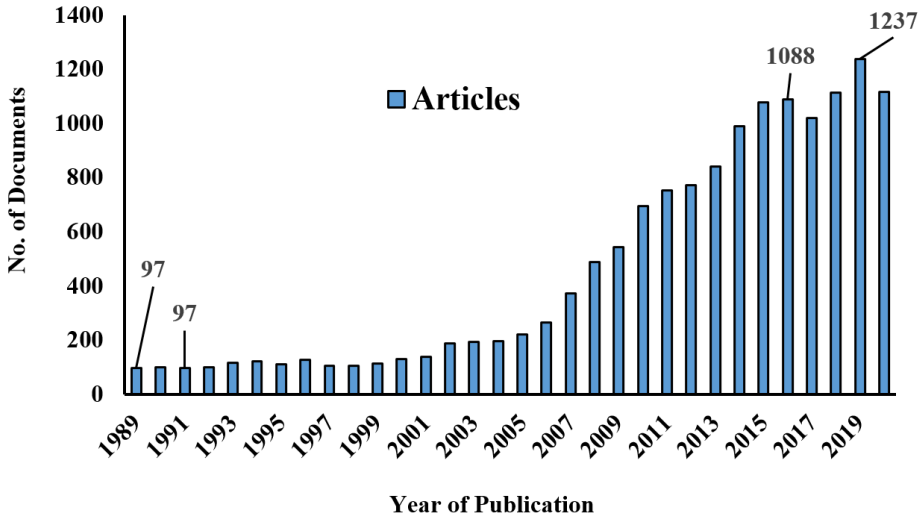


Figure 2: Growth of Cancer Literature during 1989-2020

5.3 Highly-Cited Papers

The following Table 2 shows the characteristics of the most highly cited and productive papers in which their citation received ranging from 1175-311 which received during the study period. As seen, the article entitled *"Ramucirumab monotherapy for previously treated advanced gastric or gastro-oesophageal junction adenocarcinoma (REGARD): an international, randomised, multicentre, placebo-controlled, phase 3 trial"* authored by Fuchs *et. al* (2014) published on the journal *Lancet* has received 1175 Total Citation (TC) is found to be the most highly-cited article with 146.87 Total Citation per Year (TCpY) followed by the paper *"Dasatinib versus Imatinib in Newly Diagnosed Chronic-Phase Chronic Myeloid Leukemia"* of the authors Kantarjian *et. al* (2010) has received 1041 TC published on *New England Journal of Medicine* (*NEJM*). The third highly-cited article published on the journal *Hepatology International entitled "Asian Pacific Association for the Study of the Liver consensus recommendations on hepatocellular carcinoma",* on the other hand, got 762 TC as seen in the table.

Table 2: Most highly cited papers

Paper	Author(s); Year; Source	TC	TCpY
Ramucirumab monotherapy for previously treated advanced gastric or gastro-oesophageal junction adenocarcinoma (REGARD): an international, randomised, multicentre, placebo-controlled, phase 3 trial. (Fuchs *et al.*, 2014)	Fuchs *et al.;* 2014; Lancet	1175	146.87
Dasatinib versus Imatinib in Newly Diagnosed Chronic-Phase Chronic Myeloid Leukemia. (Kantarjian *et al.*, 2010)	Kantarjian *et al.;* 2010; New Engl J Med	1041	86.75
Asian Pacific Association for the Study of the Liver consensus recommendations on hepatocellular carcinoma. (Omata *et al.*, 2010)	Omata *et al.;* 2010; Hepatol Int	762	63.50
A Prospective, Molecular Epidemiology study of EGFR Mutations in Asian Patients with Advanced Non-Small-Cell Lung Cancer of Adenocarcinoma Histology (PIONEER). (Shi *et al.*, 2014)	Shi *et al.*; 2014; J Thorac Oncol	548	68.50
Asia-Pacific clinical practice guidelines on the management of hepatocellular carcinoma: A 2017 update. (Omata *et al.*, 2017)	Omata *et al.*; 2017; Hepatol Int	517	103.40
Carcinoma of the gallbladder. (Misra *et al.*, 2003)	Misra *et al.*; 2003; Lancet Oncol	431	22.68
Dasatinib or Imatinib in newly diagnosed chronic-phase chronic myeloid leukemia: 2-year follow-up from a randomized phase 3 trial (DASISION). (Kantarjian *et al.*, 2012)	Kantarjian *et al.;* 2012; Blood	374	37.40
Effect of Age on Outcome of Reduced-Intensity Hematopoietic Cell Transplantation for Older Patients with Acute Myeloid Leukemia in First Complete Remission or with Myelodysplastic Syndrome. (McClune *et al.*, 2010)	McClune *et al.;* 2010; J Clin Oncol	324	27.00

Alterations in the P53 Gene and the Clonal Evolution of the Blast Crisis of Chronic Myelocytic-Leukemia. (Ahuja *et al.*, 1989)	Ahuja *et al.;* 1989; P Natl Acad Sci USA	311	9.42
HPV Involvement in Head and Neck Cancers: Comprehensive Assessment of Biomarkers in 3680 Patients. (Castellsagué *et al.*, 2016)	Castellsague *et al.;* 2016; JNCI-J Natl Cancer I	307	51.17

Author Productivity

As seen, 20 authors of India which contributed papers on Cancer-related aspects during 1989-2020. Kumar R with 415 papers is found to be the most productive and influential author among others followed by Sharma A with 321 papers and Kumar A with 291 papers, Table 3 shows the topmost productivity of the authors who had published more than 120 papers.

Table 3: Top productive authors

Sl. No.	Authors	NP	Sl. No.	Authors	NP
1	Kumar R	415	11	Gupta A	139
2	Sharma A	321	12	Kumar L	139
3	Kumar A	291	13	Bal C	126
4	Kumar S	267	14	Sharma P	124
5	Gupta S	236	15	Rath GK	123
6	Bakhshi S	220	16	Rekhi B	123
7	Sharma S	183	17	Das S	122
8	Gupta R	181	18	Joshi A	122
9	Singh S	169	19	Singh A	122
10	Prabhash K	151	20	Laskar S	121

*NP = Number of Publications

Figure 3 shows a graph of the top 10 authors over the years concerning their number of documents published. The line represents the timeline of an author whereas the bubbles and their sizes are proportional to the number of documents.

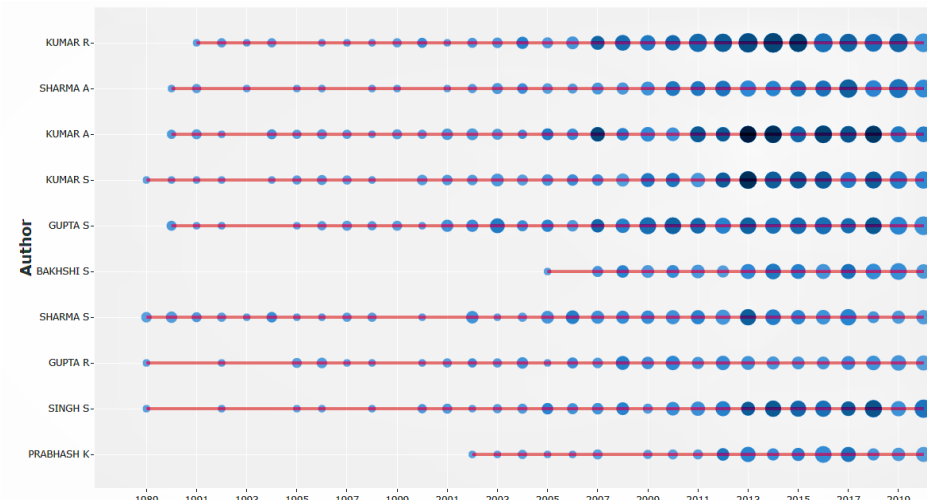


Figure 3: Authors' Productivity over time

5.5 Most Relevant Affiliations and Institutions

It is also important to explore the author's affiliation in cancer literature. Authors are affiliated with 435 institutes including private clinics and individual addresses. Table 4 showed the top 20 most productive affiliations and relevant institutions of India which had contributed their research publications in the field of cancer. As shown in the table, the *'All India Institute of Medical Science (AIIMS)'* has contributed the highest number of research publications in Cancer publications with 3068 numbers, followed by the *'Tata Memorial Hospital'* in second with 2501 publications and *'Postgraduate Institute* of *Medical Education and Research* (PGIMER)' with 1211 publications. While *'Manipal University'* and *'Tata Medical Center'* had contributed 224 each number of publications respectively. The study also detected that there was 220 number of publications from the category *'Not reported'* which means affiliation and institutions are not found in their publications. The *'Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER)'* has contributed the lowest publications in this regards with 161 documents.

Table 4: On Affiliations and Institutions Contribution

Rank	Affiliations	Articles
1	All India Inst Med Sci	3068
2	Tata Mem Hosp	2501
3	Postgrad Inst Med Educ And Res	1211
4	Christian Med Coll And Hosp	490

5	Reg Canc Ctr	472
6	Kidwai Mem Inst Oncol	339
7	Banaras Hindu Univ	269
8	Sanjay Gandhi Postgrad Inst Med Sci	266
9	Rajiv Gandhi Canc Inst And Res Ctr	249
10	Post Grad Inst Med Educ And Res	233
11	Chittaranjan Natl Canc Inst	231
12	Manipal Univ	224
13	Tata Med Ctr	224
14	Not reported	220
15	Maulana Azad Med Coll	216
16	King Georges Med Univ	208
17	Canc Inst Wia	186
18	Univ Madras	176
19	Bhabha Atom Res Ctr	174
20	Jawaharlal Inst Postgrad Med Educ and Res	161

5.6 Corresponding Author's Country

Concerning the corresponding author's contributions, as Table 5 shows, India has the highest corresponding authors with 9550 articles, 8865 SCP and 685 MCP. USA occupied second with 548 articles, 24 SCP and 524 MCP followed by the United Kingdom with 70 articles, 5 SCP and 65 MCP. Germany has the lowest corresponding authors with 39 articles, 3 SCP and 36 MCP.

Table 5: Corresponding author's Countries

Country	Articles	Frequency	SCP	MCP	MCP Ratio
India	9550	0.8840	8865	685	0.07
USA	548	0.0507	24	524	0.96
United Kingdom	70	0.0065	5	65	0.93
China	69	0.0064	0	69	1.00
Australia	61	0.0056	5	56	0.92
France	57	0.0053	0	57	1.00
Korea	54	0.0050	0	54	1.00
Japan	47	0.0044	1	46	0.98

Saudi Arabia	44	0.0041	1	43	0.98
Germany	39	0.0036	3	36	0.92

**NP = Number of Publication; SCP = Single Country Publications;*

MCP = Multiple Country Publications; AAC = Average Article Citations

5.7 Most Relevant Sources

From 1684 sources, the research papers in the areas of Cancer has been published and the top 20 productive sources/journals are presented in table 6 and visualized in figure 4, with their Number of Publications (NP), Total Citation (TC) along with Scientific Journal Ranking (SJR)-Impact Factor (IF) of 2019 and Journal Citation Report-Impact Factor (JCR-IF) of 2018 that these journals received. The journal '*Pediatric Blood & Cancer*' has published 545 publications making the first rank in terms of publications with TC (414). *'Journal of Cancer Research and Therapeutics*' is the second most productive journal with 86 publications and but in terms of citation received it is the highest among the journal under study with TC (2120). In the third rank, *'Indian Journal of Pathology and Microbiology'* has published 464 (NP) followed by *'Annals of Oncology'* (NP 397), *'Indian Journal of Cancer'* (NP 393), *'Journal of Clinical Oncology'* (NP 341), *and 'Oral Oncology'* (NP 227) and so on. Besides these, the *'Journal of Clinical Oncology'* found to be highest Impact factor (IF) both in Impact factor Indicators i.e. SJR (2019) and JCR (2018) with IF 10.05 and 28.349, respectively.

Table 6: Most Relevant Sources

Source	SJR-(IF) 2019	JCR-(IF) 2018	NP	TC
Pediatric Blood & Cancer	1.14	2.486	545	414
Journal of Cancer Research and Therapeutics	0.46	1.392	508	2120
Indian Journal of Pathology and Microbiology	0.24	0.521	464	1397
Annals of Oncology	1.04	14.196	397	442
Indian Journal of Cancer	0.26	0.429	393	1258
Journal of Clinical Oncology	10.05	28.349	341	1849
Oral Oncology	1.74	3.730	227	1913
International Journal of Radiation Oncology Biology Physics	2.1	6.203	196	1164

Indian Journal of Hematology and Blood Transfusion	0.21	0.869	191	349
Journal of Cytology	0.32	0.696	190	762
Blood	5.42	16.601	181	1566
European Journal of Cancer	3.41	6.680	179	340
Diagnostic Cytopathology	0.44	1.402	171	1130
Acta Cytologica	0.53	0.000	157	1322
European Journal of Nuclear Medicine and Molecular Imaging	2.12	7.182	153	334
Indian Journal of Surgery	0.24	0.550	132	222
Clinical Nuclear Medicine	0.58	6.703	128	1185
International Journal of Gynecological Cancer	1.01	1.746	125	658
Asian Pacific Journal of Cancer Prevention	0.5	------	123	1520
Journal of Gastroenterology and Hepatology	1.13	3.632	122	504

**NP= Number of Publications; TC= Total Citations*

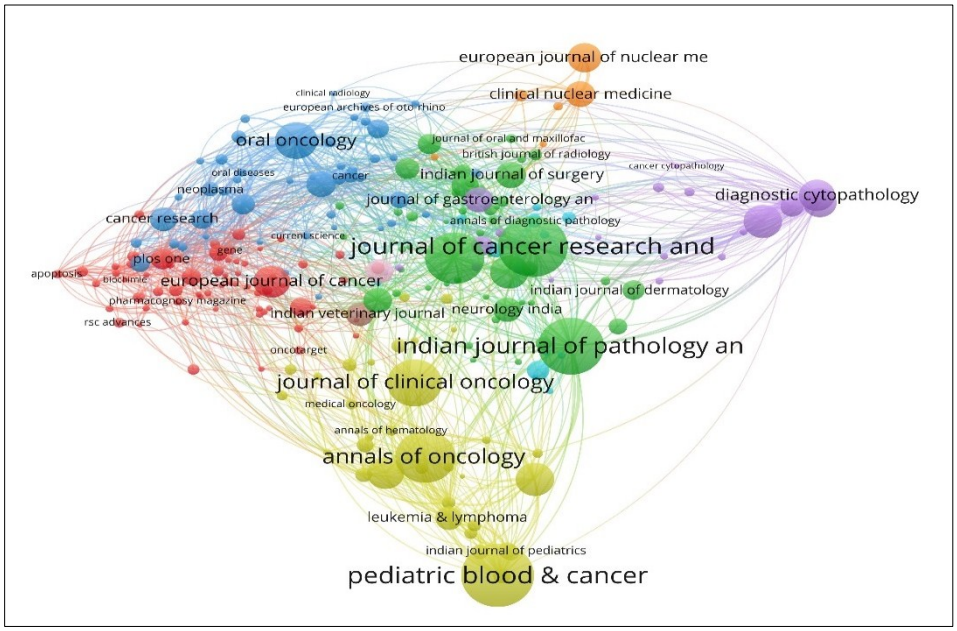


Figure 4: Most relevant sources

5.8 Keywords Analysis

To identify the emerging developments in research, statistical analysis of keywords may also be used to demonstrate how successful the field is in understanding and advancing boundaries. Two keywords namely Author keywords and KeyWords Plus are being taken into account here for analysis. From the data, there are a set of 16744 Author keywords of which 467 meet the threshold. From table 7 and figure 5, it is seen that *"apoptosis"*, *"carcinoma"* and *"metastasis"* are the top three author keywords with a frequency of occurrences *408*, *332* and *237*, respectively. Keywords such as *"hepatocellular carcinoma"*, *"immunohistochemistry"*, *"cancer"* with a frequency of occurrences *229*, *224* and *199* respectively were also found to be a good occurrence. Again as understand from table 7 and figure 6, out of 13822 sets of KeyWords Plus appeared 834 has meet the threshold, from this KeyWords Plus such as *"cancer"* with *1995* occurence, "expression" with *987* and *"head" with 465* being the top three authors.

Table 7: Top 20 most representative Author keywords and KeyWords Plus

Author keywords	Occurrences	KeyWords Plus	Occurrences
apoptosis	408	cancer	1995
carcinoma	332	expression	987
metastasis	237	head	465
hepatocellular carcinoma	229	therapy	449
immunohistochemistry	224	survival	422
cancer	199	tumors	413
oral cancer	191	apoptosis	390
squamous cell carcinoma	188	diagnosis	377
breast cancer	179	carcinoma	367
prognosis	162	cells	348
chemotherapy	157	chemotherapy	334
leukemia	155	squamous-cell carcinoma	329
radiotherapy	153	breast-cancer	301
oral squamous cell carcinoma	150	risk	300
melanoma	145	activation	298
acute lymphoblastic leukemia	142	growth	270

survival	126	children	268
cervical cancer	109	management	267
chronic myeloid leukemia	109	in-vitro	251
p53	109	gene	237

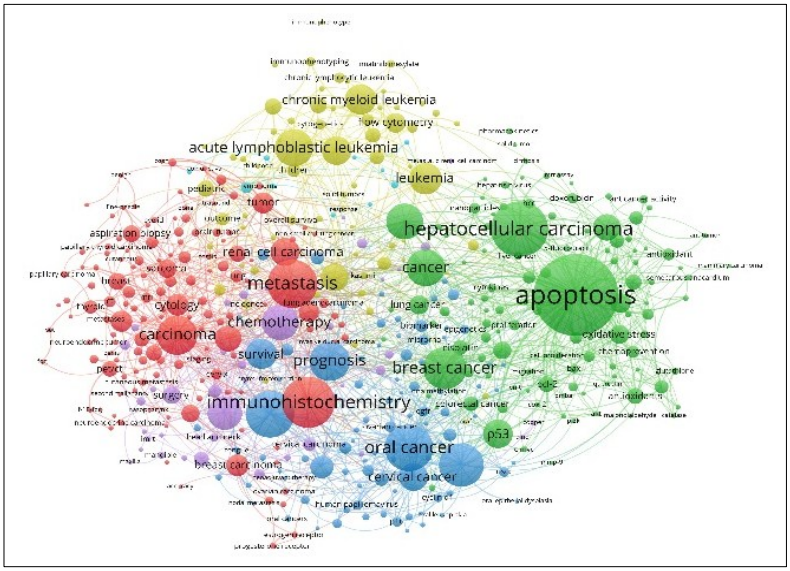


Figure 5: Author keywords

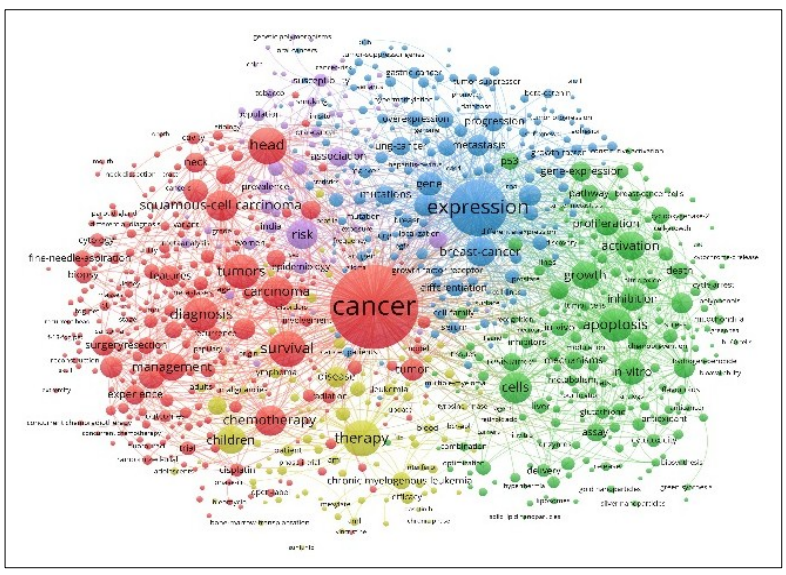


Figure 6: KeyWords Plus

6. Suggestions, Recommendations and Conclusion

The present bibliometric analysis based on the data of Indian cancer research as reflected in Web of Science (WoS) Core Collection Database for the period 1989-2020 shows that cancer research in the country is increasing. From the last few years' trends, it can be said that Indian cancer researchers published thin research outputs in different channels. The same provides us with many clues on the researches undertaken in India during the period of 31 years. WoS extracts 14,641 document types of cancer and its related areas of which the most cited articles are found to collaborate with researchers from other countries. The highest number of publication is found to be the research article. The journal *'Pediatric Blood & Cancer'* is found to be the most relevant source for the publications. While AIIMS tops among Indian Institutions in research productivity. India tops in the corresponding author's countries. A comparative study with scientific research outputs from other countries on the subject will enable us to understand the research trends in the global context. As the study reveals there is a need for encouraging collaborative research for improving early detection of cancer at the national and international levels by providing more facilities for research and development activities in the country and abroad as well.

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LIS Research Trends in India- A Study of ETDs@ Shodhganga

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Abstract: Introduction: India's higher education system is quite large, being the third in size after China and USA. Of the around 500 Universities in the country, more than 100 are offering LIS courses including research programmes. They contribute their research outputs in the form of MLIS and M.Phil. Dissertations and Ph.D. Theses. Such outputs in electronic format (ETDs) are uploaded on the INFLIBNET's Shodhganga repository. Metric study of these resources provides us clues on trends of LIS research in the country. The present study is an attempt in this regard.

Objectives: The main objectives of the study are to survey the contents of the Shodhganga repository to check the ETD contributions of Indian Universities in various fields and LIS in particular during 2010-2020. The study also aims to analyse the growth and trends of ETD contributions, leading Universities, etc. and also to determine the ratio of University and ETD contribution in LIS.

Scope and Methodology: The study covers all the Universities of India that contribute ETDs to Shodhganga with special reference to LIS subject domain. The study has been carried out through a survey of ETDs available in the said repository of the INFLIBNET center. The ETDs covered include MLIS Dissertations, M.Phil. Dissertations and Ph.D. Theses.Out of 476 Universities, a total of 109 Universities contributing ETDs in LIS till the end of the year 2020 has been taken into account for analysis. A total of 2,87,257 theses in various fields out of which 109 universities offering 2070 ETDs in LIS have been extracted from the repository. Simple statistical techniques, tables, charts, etc. have been used for metric analysis and present the data.

Recommendations, Suggestions and Conclusion: India joined the ETD movement only with the beginning of the 21st century. The movement has taken a new shape with launching of the Shodhganga by the INFLIBNET center at the beginning of the first decade of the century as the repository of the ETDs for the Indian Universities. As the present study shows, as in the ending part of 2020, a total of 2,87,257 full text theses have been contributed to the same by 476 Universities of the 538 signed for MoU. Out of 476 Universities a total of 109 Universities are found to contribute 2070 ETDs in LIS. It is also observed

from the study that there is a remarkable growth in ETD contribution which provides new area of study to the researchers. In the years to come, universities in the country would continue to further ETD contribution and making the same available for open access to the needy scholars world-wide while some of the Indian Universities are actively participating and contributing in the repository, most of them are still lagging behind. So it is recommended that authorities, LIS professionals of the universities should come forward to take the initiative in this regard.

Keywords: Indian Universities, ETDs, LIS Research, Shodhganga, Quantitative Study

1. Background

Digitization of original work of the researchers offers a new paradigm for preserving and providing access of the same to the global community. ETDs are those theses and dissertations submitted, archived or accessed primarily in electronic formats. There has been an exponential growth of ETDs in India in diverse fields. There are several electronic thesis repositories providing valuable information related to research outputs. In the context of India, INFLIBNET's Shodhganga is one such important platform where most of the Indian Universities contribute theses which enable access to the same by the scholars. Shodhganga, a reservoir of Indian theses is a digital repository maintained by INFLIBNET Centre. The documents or theses submitted to Shodhganga are available to read and download in open access. The UGC notification (Minimum Standards & Procedure for Award of M.Phil/ Ph.D Degree, Regulation 2016) dated 5th May 2016 mandates submission of electronic version of theses and dissertations by the researchers in Universities with an aim to facilitate access open to the same to the academic community world wide. One of the most interesting facts is that such medium not only provides easy access and archiving but also helps in bringing up the standard and quality of research since the researchers are being provided with the previous works leading to sorting out of the serious problem of duplication and poor quality of research. A metrics study of the web based theses available in the Shodhganga throws us light on many aspects of the researchers carried out in Indian Universities. In the present study a metric analysis of the ETDs is being made with particular reference to LIS subject.

2. Review of the Literature

Since recent past, a number of studies have been carried out in the area of ETDs and data repository system. Some of their works are being reviewed here. Lam and Chan (2007) studied the repository of Hong Kong University of Science & Technology and explained every stages and planning of developing a repository to

the global level. An explanation regarding open access and institutional repository as well was clearly given by Nazima and Devi (2008). Ghosh (2009) described the developments in ETDs repository in particular to Ph. D theses repositories in India and suggested about the policies strategies of national higher education, research-funding and policy making bodies. They explained open access will not give much burden on the library rather it will have a very high impact on information handling. It facilitates minimal restrictions on users and uses. Ezema&Ugwu (2013) revealed many challenges of ETDs and also identified strategies to mitigate these challenges. Khaparde (2014) in a survey revealed that ETDs are relatively new mode of research and scholarly communication and useful for research work and what scholars get from ETDs cannot be found in any other source of information. Kim and Lee (2014) showed that a trend of building research data repository started with the increasing numbers of Universities and research centres. He also revealed that such research data repositories have fascinating the permanent access to the data sets from the researchers. Sivakumaren (2015) examined the ETDs submitted to the Shodhganga repository by the universities of India. He studied the contributions of top 5 universities and found that Jawaharlal Nehru University has the highest contribution. In a study, Sengupta (2019) evaluated the contribution of ETDs by the state universities of Maharastra in the open access repository of Shodhganga by INFLIBNET in which he found that out of 12 universities, though 11 universities signed MoU for Shodhganga, only 8 universities contributed ETDs to the repository till the date of data collection. Verma et al. (2020) analysed the Doctoral theses and dissertations submitted by the central universities of Northeast India in LIS to the Shodhganga of INFLIBNET. During the study, it was found that some of the central universities of Northeast India are still not contributing their Doctoral theses in the subject domain and the highest number of theses was uploaded by Manipur University and NEHU respectively.

3. Objectives of the study

The objectives of the present study are:

- To survey the INFLIBNET's Shodhganga to check the ETD contributions of Indian Universities.
- To know the contributions of ETD in LIS field.
- To ascertain the growth and trends of ETDs during 2010-2020.
- To understand the top contributing universities.

- To determine the ratio of University and ETD contributions in LIS.

4. Scope, Sample and Methodology

In the present study all the Indian Universities contributing ETDs in Shodhganga with particular reference to universities contributing such resources in LIS subject domain have been covered. For the purpose ETDs available on the repository of the INFLIBNET centre have been surveyed. The ETDs covered include MLIS Dissertations, M.Phil Dissertation and Ph.D Theses. The contents of Shodhganga have been extensively used and examined. Out of 476 Universities, a total of 109 Universities contributing ETDs in LIS till the end of the year 2020 (as on 30th November 2020) has been taken into account for analysis. A total of 2,87,257 theses in various fields of study, out of which109 universities offering 2070 such resources in LIS have been extracted from the repository for study. Appropriate statistical techniques, tables, charts, etc. have been used to analyse and present the data.

5. Shodhganga- A Brief Profile

Shodhganga is a digital repository of theses and dissertations maintained by INFLIBNET centre, an autonomous Inter-University centre of University Grants Commission (UGC) of India. It was set up using open source digital repository software called DSpace developed by Massachusetts Institute of Technology (MIT) in partnership with Hewlett Packard (HP). It provides a platform for the scholars to deposit their Ph.D theses and dissertations and make them available to the entire scholarly community. This repository was launched making compulsory for all Indian Universities to submit soft copies of Ph.D theses and dissertations through regulation issued in June 2009. Presently, the total number of full text theses contributed by 476 Universities is 2,87,257 while the number of Universities signed MoU (to contribute their ETDs) is 538 as on 30th November 2020.During the period 2010-2020, the repository has enabled access to the scholars a large amount of full text research theses covering more than 500 Indian Universities providing a new vista for the researchers in selecting new avenues or areas of research in diverse fields.

6. Data Analysis

6.1 Top 10 Universities

The following table-1 shows the list of the top 10 (ten) Universities contributing ETDs in Shodhganga as on 30th November 2020.

Table-1: Top 10 Universities contributing ETDs in Shodhganga

Sl. No.	Name of the University	No. of ETDs	Percentage (%)
1	University of Madras	12,262	14
2	University of Calcutta	11,905	13
3	Savitribai Phule Pune University	10,561	12
4	Anna University	9827	11
5	Chhatrapati Sahuji Maharaj University	9781	11
6	Aligarh Muslim University	8264	9
7	V.B.S. Purvanchal University	8203	9
8	Panjab University	7645	8
9	Bharathidasan University	5931	7
10	Bharathiar University	5717	6
Total		90,096	100

The contribution of the top 10 universities shows a wide range of differnce between the maximum and minimum number of ETDs, the difference being 6545 theses(46.6%). There is a close gap in the number of ETDs among the first top 3 universities, their respective percentages stand at 14%, 13% and 12% in respect of University of Madras, University of Calcutta and Savitribai Phule Pune University. In the rest next top seven universities the percentage difference is found to be in near proximity showing a downward trend. Bharathiar University lasts in the list with 6% of ETDs being contributed. Out of 2,87,257 ETDs by 476 Universities a total of 90,096 i.e. 31.36% of ETD is contributed by top ten universities.

6.2 Growth Trend of ETD

From the table-2, it is observed that the contribution of ETDs in Shodhganga keep increasing with time and the highest growth is seen in 2019 and lowest being in 2010. The overall growth rate, however, in the repository is not uniform. While during the period 2016-2017, there is an increasing trend in the number of ETDs contributed to the repository. During 2017-2018 there is a sharp decrease in the number of the same and ultimate starts increasing in 2019 as depicted by figure.-1 and figure-2.

Table 2: Yearly Growth trend

Sl. No.	Year	No. of ETD	Yearly difference	Percentage (%)	Sl. No.	Year	No. of ETD	Yearly difference	Percentage (%)
1	2010	1,171	1,171	(0.00)	6	2015	60,037	31,206	(48.02)
2	2011	2,693	1,522	(43.48)	7	2016	1,16,000	55,963	(51.76)
3	2012	4,992	2,299	(53.95)	8	2017	1,75,000	59,000	(66.29)
4	2013	12,049	7,057	(41.43)	9	2018	2,11,800	36,800	(82.63)
5	2014	28,831	16,782	(40.39)	10	2019	2,50,000	38,200	(84.72)

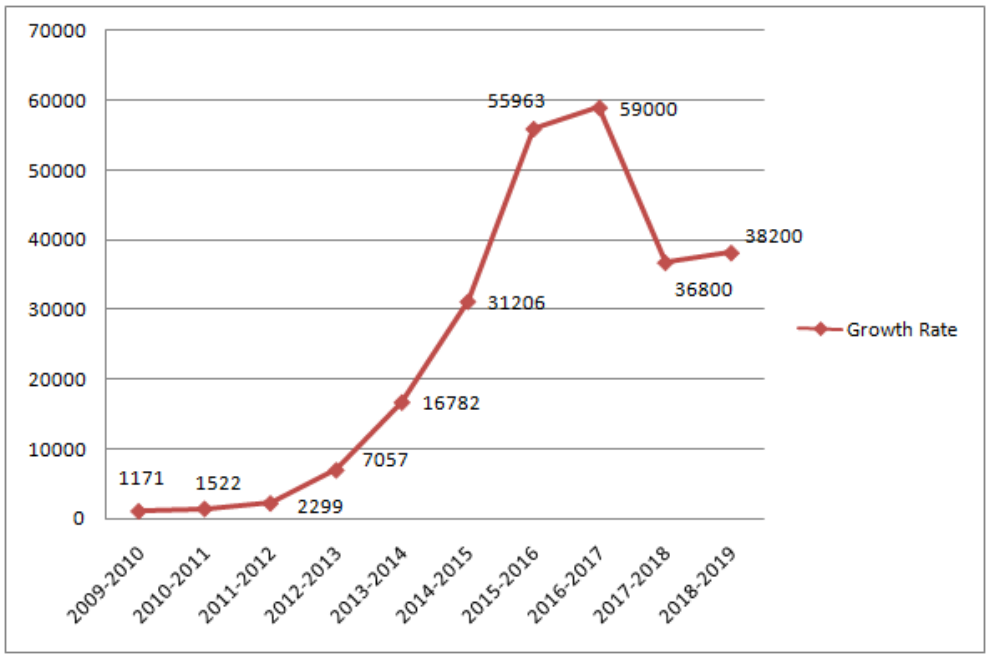
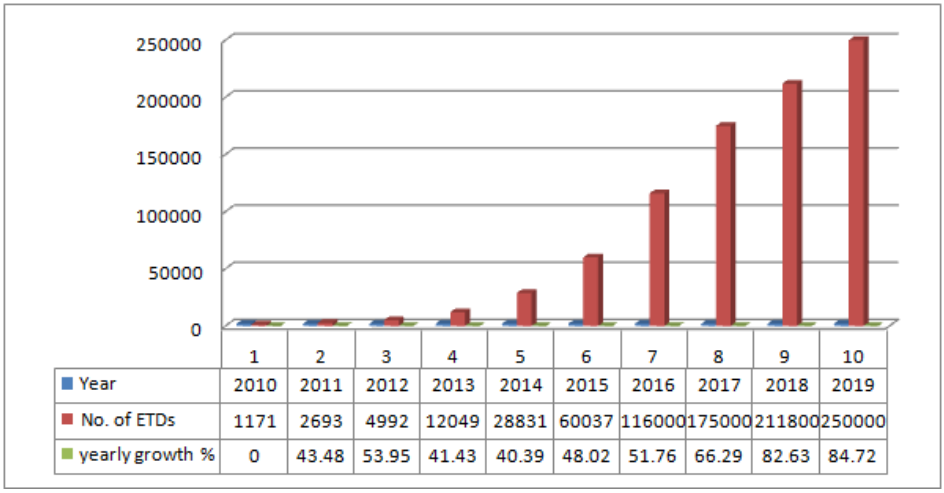


Figure 1: ETD: Differences in Yearly increase



	1	2	3	4	5	6	7	8	9	10
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of ETDs	1171	2693	4992	12049	28831	60037	116000	175000	211800	250000
yearly growth %	0	43.48	53.95	41.43	40.39	48.02	51.76	66.29	82.63	84.72

Figure 2: ETD:Yearly growth rate

6.3 ETD Contribution of Universities in Shodhganga

Table-3 provides an overall scenario of quantum of ETDs of the universities in two aspects (a) upto 1000 and (b) above 1000 number of the resources available in the repository.

Table 3: ETDs at a Glance

Universities contributing upto 1000 ETDs				Universities contributing above 1000 ETDs		
ETD Size	**No. of University**	**Percentage %**		**ETD Size**	**No. of University**	**Percentage %**
0-100	289	71.36		1000-2000	28	39.44
100-200	43	10.62		2000-3000	18	25.35
200-300	20	4.94		3000-4000	7	9.86
300-400	15	3.70		4000-5000	5	7.04
400-500	10	2.47		5000-6000	5	7.04
500-600	9	2.22		6000-7000	0	0.00
600-700	4	0.99		7000-8000	1	1.41
700-800	2	0.49		8000-9000	2	2.82
800-900	6	1.48		9000-10000	2	2.82
900-1000	7	1.73		10000-above	3	4.23
Total	405	100		Total	71	100

A total of 405 and 71 universities of the country contributed ETDs in first and second aspect respectively. The table further indicates that universities contributing upto 100 are highest. While there is no University contributing between 6000-7000 ETDs, the number of university contributing ETDs between 7000-8000 is lowest and stands at 1 only.

6.4 Universities and their ETDs in LIS

During the period under study a total of 109 universities of the country are found to contribute 2070 LIS ETDs in Shodhganga as the table-4 below shows.

Table-4 Status of ETDs in LIS

ETD size	No. of ETD	No. of University	Ratio (appx)
0-20	489	74	1:7
20-40	519	19	1:27
40-60	343	7	1:49
60-80	338	5	1:68
80-100	165	2	1:83
100-120	216	2	1:108
Total	2070	109	

In India, the number of universities contributing ETDs in LIS is very less. A total of 109 universities contributed such resources with 489 ETDs by 74 of them indicating an average of 7 ETDs by each university. Highest contribution is from 2 universities with an average of 108 ETDs.

6.5 Top 10 Universities in LIS ETDs

In Shodhganga 109 Universities are found to contribute LIS ETDs differently in its number. The following table-5 shows the list of top10 Universities contributing LIS ETDs till the end of November 2020.

Table-5: LIS ETDs of Top 10 Universities

Sl. No.	Name of University	No. of LIS ETD	Sl. No.	Name of University	No. of LIS ETD
1	Manonmaniam Sundaraner University	110	6	Aligarh Muslim University	70
2	Karnatak University	106	7	University of Mysore	69

3	Bharathiar University	85	8	Bharathidasan University	60
4	Savitribai Phule Pune University	80		Dr. Babasaheb Ambedkar Marathwada University	60
5	Sri Venkateswara University	79	9	Gauhati University	58
			10	Alagappa University	57

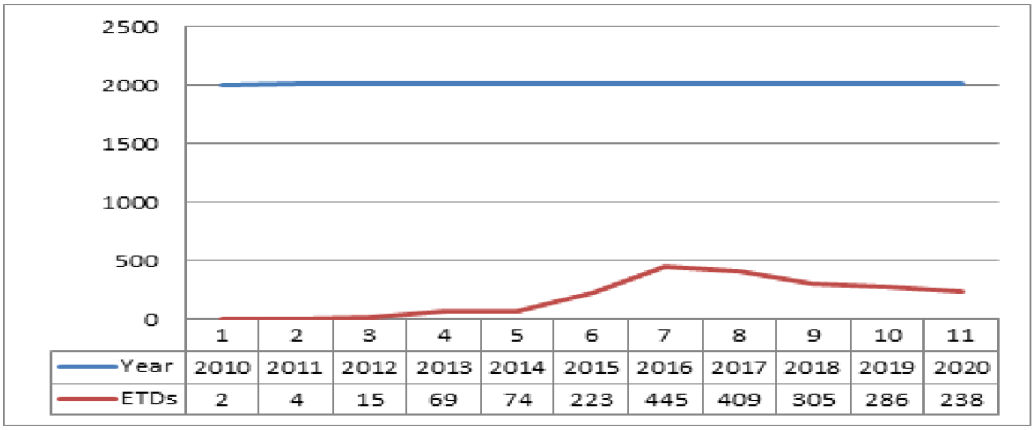
Among the top 10 universities, only two contribute more than 100 ETDs to the repository during the period under study while the rest universities contributing ETDs in the range 57-85 showing close gap of differences in between. Out of 2070 LIS ETDs contributed by 109 universities, a total of 834 i.e. 40.29% of contribution is from the top ten universities indicating that the productivity of other universities is very less.

6.6 Trends in growth rate of LIS-ETDs

The following table-6 and its corresponding figure-3 show the yearly growth rate of LIS ETDs in Shodhganga during the period.

Table-6 LIS ETD: Yearly Growth Rate

Year	ETDs	Yearly difference	Percentage (%)
2010	2	2	0.10
2011	4	2	0.19
2012	15	11	0.72
2013	69	54	3.33
2014	74	5	3.57
2015	223	149	10.77
2016	445	222	21.50
2017	409	-36	19.76
2018	305	-104	14.73
2019	286	-19	13.82
2020	238	-48	11.50
Total	2070		100



	1	2	3	4	5	6	7	8	9	10	11
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
ETDs	2	4	15	69	74	223	445	409	305	286	238

Figure 3: Trends in yearly growth rate of LIS ETDs

As observed the growth rate keeps changing from year to year, witnessing highest in 2016 with 445 ETDs whereas the lowest being in the year 2010 with only 2 ETDs. It indicates that the Shodhaganga shall continue to make accessible more and more such resources in the years to come.

6. Suggestions, Recommendation and Conclusion.

ETD forms an important source for research as well as recreation in an academic institution. It helps the researchers to know about the research works carried out so far. As the study shows that contribution of ETDs in Shodhganga keeps increasing and the highest growth is seen in 2019. University of Madras contributes highest ETDs in various field and Manonmaniam Sundaraner being the top contributor in LIS ETD. Surveying Shodhganga, one can understand various aspects and clues of the researchers in the country. ETDs are promoting resource showing and ensuring quick retrieval of information world wide. India joined the ETD movement only with the beginning of the 21st century. The movement has taken a new shape with launching of the Shodhganga by the INFLIBNET center at the beginning of the first decade of the century as the repository of the ETDs for the Indian Universities. As the present study shows, as in the ending part of 2020, a total of 2,87,257 full text theses have been contributed to the same by 476 Universities of the 538 signed for MoU. Out of 476 Universities a total of 109 Universities are found to contribute 2070 ETDs in LIS. It is also observed from the study that there is a remarkable growth in ETD contribution which provides new area of study to the researchers. In the years to come, universities in the country would continue to further ETD contribution and making the same available for open access to the needy scholars

world-wide while some of the Indian Universities are actively participating and contributing in the repository, most of them are still lagging behind. So it is recommended that authorities, LIS professionals of the universities should come forward to take the initiatives in this regard so that all the research outputs of the country can be accessible from a single platform.

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Appendix-1

Universities contributing ETDs in Shodhganga with respect to LIS

Sl. No.	Name of the Universities	Total no. of ETDs	No. of LIS ETDs	Percentage (%)
1	Madhya Pradesh Bhoj open University	1	1	100.00
2	Mandsaur University	3	3	100.00
3	Galgotias University	7	2	28.57
4	Guru Ghasidas University	95	23	24.21
5	Dr. Babasaheb Ambedkar Open University	106	15	14.15
6	Singhania University	15	2	13.33
7	Dr. C.V. Raman University	39	4	10.26
8	Rai University	143	13	9.09
9	Karnataka State Women's University	143	12	8.39
10	University of Science and Technology, Meghalaya	40	3	7.50
11	Hindustan University	81	6	7.41
12	Tilak Maharashtra Vidyapeeth	744	44	5.91
13	Mizoram University	448	25	5.58
14	Dr. B. R. Ambedkar University, Agra	136	7	5.15
15	Baba Saheb Bhimrao Ambedkar University	254	13	5.12
16	Monad University	20	1	5.00
17	Tumkur University	112	5	4.46
18	Vidyasagar University	456	20	4.39
19	Rabindra Bharati University	166	7	4.22

20	Sri Chandrasekharendra Saraswatai Viswa Mahavidyalaya	321	13	4.05
21	Periyar Maniammai University	80	3	3.75
22	Swami Vivekananda University	55	2	3.64
23	Gulbarga University	811	29	3.58
24	Annamalai University	1236	43	3.48
25	IGNOU	322	11	3.42
26	Karunya University	328	11	3.35
27	Mangalayatan University	32	1	3.13
28	Gujarat Vidyapith	513	16	3.12
29	Reva University	70	2	2.86
30	Alagappa University	1996	57	2.86
31	Jadavpur University	925	26	2.81
32	Krantiguru ShyamjiKrishna Verma Kachchh University.	109	3	2.75
33	Mangalore University	1340	36	2.69
34	Madhav University	40	1	2.50
35	Nims University Rajasthan	163	4	2.45
36	Manipur University	1122	27	2.41
37	Kurukshetra University	1015	24	2.36
38	Sambalpur University	1651	39	2.36
39	Karnatak University	4570	106	2.32
40	University of Mysore	3210	69	2.15
41	University of Calicut	1541	31	2.01
42	SNDT Womens University	1119	22	1.97
43	Manonmaniam Sundaraner University	5669	110	1.94
44	NEHU	2097	40	1.91
45	Rabindranath Tagore University Bhopal	54	1	1.85
46	Madurai Kamraj University	2613	48	1.84
47	Andhra University	235	4	1.70
48	Tamil University	61	1	1.64
49	Sri Venkateswara University	4909	79	1.61
50	Jiwaji University	1331	21	1.58
51	Banasthali Vidyapith	1448	22	1.52

52	Veer Narmad South Gujarat University	536	8	1.49
53	Bharathiar University	5718	85	1.49
54	University of Jammu	812	12	1.48
55	Integral University	410	6	1.46
56	Sant Gadge Baba Amravati University	958	14	1.46
57	The University of Burdwan	2594	37	1.43
58	University of Mumbai	445	6	1.35
59	Mother Teresa Womens University	891	12	1.35
60	Kuvempu University	1268	17	1.34
61	Bundelkhan University	1815	23	1.27
62	Tata Institute of Social Science(TISS)	397	5	1.26
63	Awadesh Pratap Singh University	86	1	1.16
64	Dr. Babasaheb Ambedkar Marathwada University	5200	60	1.15
65	Guru Nanak Dev University	1360	15	1.10
66	Vikram University	95	1	1.05
67	Mewar University	96	1	1.04
68	University of Kota	96	1	1.04
69	Gauhati University	5576	58	1.04
70	Bharathidasan University	5931	60	1.01
71	University of Kashmir	893	9	1.01
72	C.U. Shah University	104	1	0.96
73	Sri Krishnadevaraya University	3327	31	0.93
74	Periyar University	2022	18	0.89
75	Aligarh Muslim University	8264	70	0.85
76	North Maharashtra University	363	3	0.83
77	University of Kerala	2956	24	0.81
78	University of Delhi	508	4	0.79
79	Punjabi University	1154	9	0.78
80	Osmania University	656	5	0.76
81	Savitribai Phule Pune University	10561	80	0.76
82	Mohan Lal Sukhadia University	407	3	0.74
83	Panjab University	7645	53	0.69

84	Maharaja Krishnakumar Sinhji Bhavnagar University	1299	9	0.69
85	Hemchandra Charya North Gujarat University	333	2	0.60
86	Utkal University	4862	29	0.60
87	University of Kalyani	2523	15	0.59
88	The Gandhigram Rural Institute	1018	6	0.59
89	Assam University	1436	8	0.56
90	Pt. Ravishankar Shukla University	2547	14	0.55
91	Kalasalingam University	185	1	0.54
92	Solapur University	206	1	0.49
93	Sardar Patel University	2834	13	0.46
94	Bangalore University	1372	6	0.44
95	Shivaji University	3978	17	0.43
96	IIS(Deemed to be University)	235	1	0.43
97	University of Lucknow	1020	4	0.39
98	Banaras Hindu University	2365	8	0.34
99	Shri Jagdishprasad Jhabarmal Tibarewala University	2421	8	0.33
100	Bharat Vidyapith Deemed University	323	1	0.31
101	Swami Ramanand Teerth Marathwada University	4014	12	0.30
102	Maharaja Sayaji Rao University of Baroda	3741	10	0.27
103	Kannur University	404	1	0.25
104	Saurashtra University	2440	6	0.25
105	University of Madras	12316	30	0.24
106	Pondicherry University	1766	4	0.23
107	University of Calcutta	11905	19	0.16
108	Dr. Harisingh Gour University	2016	3	0.15
109	Gujarat University	3645	2	0.05
Total		188343	2070	

Trends of Doctoral Research in Library and Information Science as Mirrored In Shodhganga

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Abstract: Trends are brilliant predictors of the future. This gives the reason to analyze the facts and figures of contemporary Library and Information Science (LIS) research in India as they are mirrored in Shodhganga : The Reservoir of Indian Theses. The main purpose of this study is to explore the growth and development of LIS doctoral research in India. By accurately capturing these trends and analyzing them, the study can effectively map the development of LIS in the new millennium, thus providing a comprehensive understanding of the evolution of major themes and trends in the field. The findings show that there are 2015 doctoral theses uploaded to Shodhganga during 2010 to 17thJanuary 2021 in LIS by 111 universities. The data relating to research growth and development were analysed and presented under seven different heads viz., Year-wise Growth, State-wise Distribution, University-wise Distribution, Most Contributing Supervisors, Most Preferred and Emerging Area of Research and Gender-wise Distribution in LIS. The findings reveal that 2016 was the most productive year with 443 (21.98%) theses and highest number of doctoral research was carried out in Manonmaniam Sundaranar University, Tamilnadu (5.45%). The research output also traced that Dr. C. R. Karisiddappa is the most contributing supervisor (1.68%) and 86 researches were carried out under joint supervision. The findings indicate that Metric Study, Automation, Usages of Electronic and Web Based Resources, Social Networking, Consortia, Knowledge Management, Digital Information Literacy etc. are some of the areas of research that LIS researchers are more interested in. These findings will provide directions to scholars for further research in the LIS field.

Keywords: Doctoral Research,Growth and Development of LIS Research, Thematic Evolution, Research Trends, Shodhganga.

1. Introduction

Research is a generic term which covers all kinds of activities aimed to find responses to worthwhile questions by means of a systematic and scientific approach. Precisely the basic aim of research is to get the information and knowledge needed for problem solving and decisions making. It plays an important role in discovering

new technologies and its application in the best possible ways by filling the gaps in knowledge and changing the way that people work. The advent of Information and Communication Technology (ICT) has changed the landscape of library and information centres across the globe. The concept of digital libraries and virtual libraries has become the reality in the present century. Technology has been changing at a very fast rate and cloud computing, Big Data, Internet of Things (IoT) are the current buzz words even in the Library and Information Science (LIS) field. Consequently the role and responsibilities of LIS professionals are also evolving. In the profession a notable trend was observed with the inclusion of "Information" as part of the discipline's name. Library Science focused on the professions of librarianship with practical library issues and collection management in its early stages rather than the management of information (Han, 2020).

As an important discipline, LIS has a long history which has emerged in a haphazard way. From the lock and key restricted access collections to today's multimedia Open Access Resources, this profession has crossed a long way. Different forms of Information and Communication Technologies have also been integrated into library practices, such as Augmented/ Virtual Reality, Cloud Computing, Data Mining, Blockchain Technology etc. Evidently, the rapid and constant advancement of technologies have changed the ways library and information centres used to function.

In India as, digital divide is still a matter of concern the professionals are required to develop the sufficient skills to carry out some of the traditional library activities and at the same time they are expected to take proactive approach to adopt the emerging technologies. Hence it is important to enable the profession to address the challenges through basic as well as applied researches. As a response to this, there is a need to examine the research trends in the field to trace how the profession has been evolved and effectively the practical problems are addressed. Such effort can serve as important evidence to document the development of the field and to identify new research trends for budding researchers.

2. **Review of Literature**

Exploring trends in scientific research is an area of interest for many researchers. There are significant numbers of studies focusing on LIS doctoral research trends in India.

Lahiri (1996) had studied doctoral research trend in Library Science during 1950-1995. The study reported growth pattern, productivity of the universities, areas of research and types of work. Data for the study was collected from University News - The Newsletter of Association of Indian Universities along with some secondary sources. In addition to India, it had also elaborately discussed the research

scenario of LIS in some foreign countries as well. The findings were based on the 255 doctoral research carried out in a long period of 45 years. The study reported intensification of LIS doctoral research after 1990 as fifty percent of the total research carried out till 1995 was contributed during 1990-1995 (Lahiri, 1996).

Satija described the Beginning, Growth of doctoral research and Proliferation of education in Library and Information Science (LIS) in India. Through his study the author had voiced his concern over the quality as well as quantity of research stating the trends as mindless journey as the approach of that time was mainly survey based focusing on the examination of the state-of-the-art. As per the author's opinion apparently because of lack of perception to visualise and identify valid problems for research, the researchers were not engaging with the areas where research was needed for the growth of the profession (Satija, 1998).

Manjunatha and Shivalingaiah had reported a decade old research trends of LIS in 1998. The period covered under this study was 1987-1997. The data set for the study was consisting of 255 research submissions for the degree of Ph.D in LIS out of which degree was awarded to 151 researches while 104 were ongoing research studies in different stage of completion. The study reported an upward trends of LIS research during 1990s (Manjunatha & Shivalingaiah, 1998).

Mahapatra and Sahoo had studied the trends of LIS research at Ph.D. level during 1997-2003. The main aim of the study was to appraise the perspective of LIS research community to make them aware of the direction of the research. The findings were based on 164 research work carried out during that period. It reported the Growth Pattern, Productivity of Universities as well as Supervisors along with areas of research (Mahapatra & Sahoo, 2004).

Singh and Babbar provided a comprehensive study of doctoral research carried out by various LIS departments of India. Data for the study was collected through a questionnaire. Based on data collected from 81 departments located in 22 states of India, the growth and development of LIS research in India since the award of first Ph.D in 1950 till 2012 were reported. The study revealed that research in LIS was at low ebb up to late 1970s. However after that the number of Ph.Ds had been continuously increasing over the decades. The second decade of the 21st century has crossed all previous records with annual growth rate of 144 per year reported during 2010-2012. (Singh & Babbar, 2014)

3. Objective of the Study

The study is an attempt to understand the trends in LIS doctoral research by analyzing the doctoral dissertations deposited at Shodhganga: The Reservoir of

Indian Theses through the following objectives.

- Year-wise growth of research
- State-wise distribution of research
- University-wise distribution of research
- Productivity of supervisor
- Emerging theme of research
- Dominant/ Influential themes
- Gender- ratio in LIS doctoral research

3. Scope And Limitation Of The Study

The present study is based on the theses available in the Shodhganga repository which consists of 2015 theses deposited from 111 universities. Doctoral research carried out by Indian Universities but theses not deposited to Shodhganga are outside the purview of the present study.

4. Methodology and Source of Data

Shodhganga: The Reservoir of Indian Theses (https://shodhganga.inflibnet.ac.in/) was thoroughly investigated university-wise to find out the availability of theses related to LIS in the database. Meta data of each and every thesis was downloaded and saved in CSV format for further analysis. Data for this study was downloaded between Date 10 January 2021 to Date 17 January 2021. A total of 2076 theses were found to be available under the department of LIS across the universities. However 26 theses were apparently out of the scope of LIS though listed under it viz. Relative radiometric correction of multitemporal satellite images (SNDT Women's University), A Structural Study of The Chemical Components of A Few Indian Plants(Sri Venkateswara University), Speedy trial in criminal justice system: an appraisal (Aligarh Muslim University). Secondly, 35 theses were found to be duplicates in nature. Hence the study is based on only 2015 theses after excluding 61 these entries from the final data sheet. Further 42 theses written in various regional languages are excluded from the thematic study owing to difficulty in understanding the theme of the thesis. Irrespective of the date of award, for this

study the date of uploading of the theses to Shodhganga has been taken into consideration while calculating the growth of doctoral research over the years.

5. Data Analysis and Interpretation

5.1 Year-wise Growth of Doctoral Research in LIS

Table 1:-Year-wise Growth of Doctoral Research

S.N.	Year	No. of Doctoral Research	Percentage of Total Research	Cumulative Percentage
1	2010	2	0.10	0
2	2011	5	0.25	0.35
3	2012	17	0.84	1.19
4	2013	69	3.42	4.62
5	2014	74	3.67	8.29
6	2015	204	10.12	18.41
7	2016	443	21.99	40.40
8	2017	402	19.95	60.35
9	2018	288	14.29	74.64
10	2019	264	13.10	87.74
11	2020	238	11.81	99.55
12	2021	9	0.45	100
Total		**2015**	**100**	**100**

The year-wise growth of doctoral research in LIS during the period (2010 -2021) is shown in Table 1. It can be seen from Figure 1 that the growth rate of research were not uniform in the overall time period and varies considerably. The observation of data indicated that from the beginning there was an upward trend and the increase of research during this span of study reached a peak in 2016 with 443 researches (21.99%). Immediately after that it started decreasing till the end, though the year 2021 has shown a good start with 9 theses uploaded within a span of few days only till the collection of data which ended on 17 January 2021.

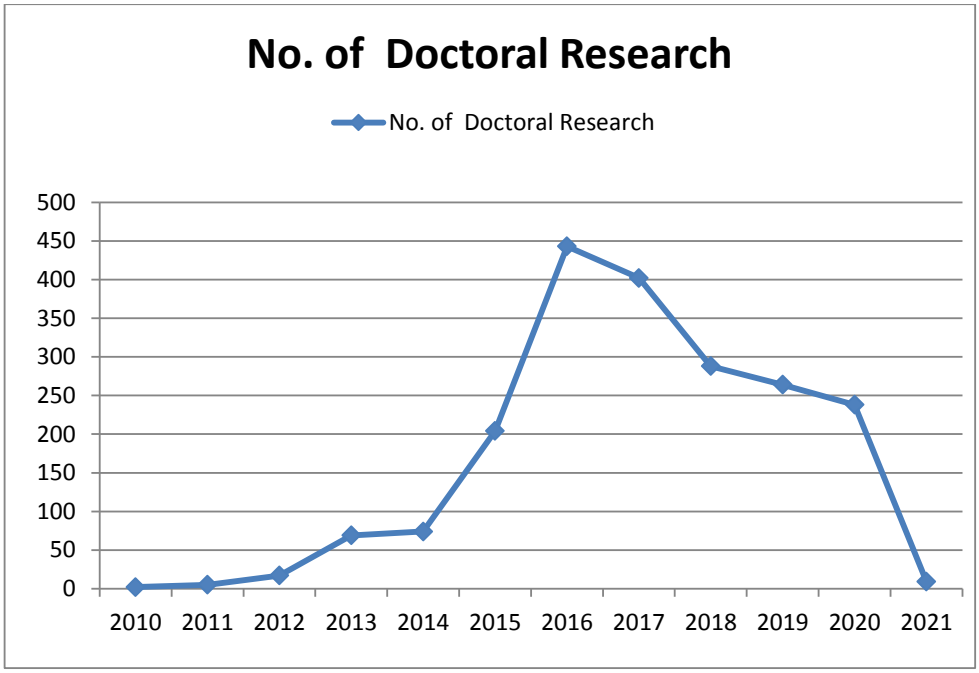


Figure 1:- Year-wise Growth of Doctoral Research

5.2 Top Ten Highest Contributing States of Doctoral Research in LIS

Table 2:-Top Ten Highest Contributing States

S.N.	Name of the state	Total No. of Universities	Total No. of Doctoral Research	Percentage of Total Research
1	Tamil Nadu	16	500	24.81
2	Karnataka	9	286	14.19
3	Maharashtra	14	246	12.21
4	Uttar Pradesh	10	125	6.20
5	West Bengal	6	111	5.51
6	Andhra Pradesh	3	108	5.36
7	Punjab	3	80	3.97
8	Assam	2	70	3.47
9	Gujarat	11	69	3.42
10	Odisha	2	67	3.33
Total		76	1662	82.48

There are 111 universities across 22 States and Union Territories (UT) of India whose Ph.D. theses are found to be available on the Shodhganga platform. Table 2 provides data of only 10 high performing states which have awarded 1662 (82.48%) doctoral degrees cumulatively. It can be observed from the data that Tamilnadu is on the top with highest contribution of 500 (24.81%) Ph.Ds followed by Karnataka 286 (14.19%), Maharashtra 246 (12.21%), UttarPradesh 125 (6.20%) and West Bengal 111 (5.51%). The data reveals a wide variation in the number of universities from each state and their contribution towards doctoral research in LIS.

5.3 Top Ten Highest Contributing Universities of Doctoral Research in LIS

Table 3:- Top Ten Highest Contributing Universities

S.N.	Name of the University	No of PhD Awarded	Percentage of Total Research
1	Manonmaniam Sundaranar University, Tamil Nadu	110	5.46
2	Karnatak University, Karnataka	106	5.26
3	Bharathiar University, Tamil Nadu	85	4.22
4	Savitribai Phule Pune University, Maharashtra	80	3.97
5	Sri Venkateswara University, Andhra Pradesh	79	3.92
6	University of Mysore, Karnataka	69	3.42
7	Dr. Babasaheb Ambedkar Marathwada University, Maharashtra	60	2.98
8	Aligarh Muslim University, Uttar Pradesh	59	2.93
9	Bharathidasan University, Tamil Nadu	59	2.93
10	Gauhati University, Assam	58	2.88
Total		765	37.97

During the total period of study, 2015 Ph.Ds have been awarded by 111 universities. As Table 3 indicates, the highest contributing university is the ManonmaniamSundaranar University(110), followed closely by the Karnatak University (106), then the Bharathiar University (85), Savitribai Phule Pune

University (80) and Sri Venkateswara University (79). Analysis of top ranking universities presented in Table 3, reveals that out of the 111 universities, these top 10 universities have awarded 765 (37.97%) of the total Ph.D awarded.

5.4 Top Ten Highest Contributing Supervisor of LIS Research

Table 4:- Highest Contributing Supervisor

S.N.	Name of the Supervisor	Name of the Contributed Universities	Total No. of Theses Guided	Percentage of total research
1	Dr. C. R. Karisiddappa	• Karnatak University • Utkal University • Shivaji University • Tilak Maharashtra • Vidyapeeth	34	1.69
2	Dr. K. Chinnasamy	• Alagappa University • Bharathir University • Madurai Kamraj University • ManonmaniamSundaranar University • Mother Teresa Womens • University	22	1.09
3	Dr. S. L. Sangam	• Karnatak University • Manipur University • Kuvempu University	22*	1.09
4	Dr. P. Balasubramanian	• Manonmaniam Sundaranar University • Bharathidasan University	20	0.99
5	Dr. V. Jalaja	• University of Calicut	17	0.84
6	Dr. Narendra Lahkar	• Gauhati University	17	0.84
7	Dr. K. C. Panda	• Sambalpur University • Utkal University	17	0.84
8	Dr. B. D. Kumbar	• Karnatak University	16	0.79

9	Dr. S.Srinivasaragavan	Bharathiar University Manonmaniam Sundaranar University Mother Teresa Womens University Madurai Kamraj University	16	0.79
10	Dr. B. K. Choudhury	Sambalpur University Maharaja Krishnakumarsinhji Bhavnagar University	15*	0.74
Total			196	9.73

Note:- *01 thesis with Co-Guide

Based on the analyses of data it is found that total 2015 doctoral research have been completed under the guidance of 546 supervisors (459 single and 87 joint supervisors). Table 4 reveals the highest contributing supervisors who account for guiding total 196 (9.73%) doctoral research. Among these 10 supervisors, Dr. C.R. Karisiddappaha guided highest number of scholars 34 (1.69%) followed by Dr. K. Chinnasamy 22 (1.09%). Out of the total research supervised by Dr S. L. Sangam and Dr B. K. Choudhury one each has been supervised jointly with co-guide. Of the total 2015 doctoral research 87 (4.31%) have been carried out under joint supervision.

5.5 Domain-wise Distribution of LIS Research

Table 5:-Most Preferred Domain of Research

Theme	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Percentage
User Study / User Education	0	2	0	13	18	61	96	100	101	65	68	3	**527**	**26.71**
Metric Studies	0	0	1	6	8	21	52	64	38	34	44	1	**269**	**13.63**
Automation	0	1	5	10	10	28	51	40	22	35	27	0	**229**	**11.61**
Knowledge Management	0	0	0	1	5	18	48	41	19	23	5	2	**162**	**8.21**

Human Resource Development &Management	0	0	0	3	7	12	32	29	16	22	14	0	**135**	**6.84**
Library Management	0	1	2	6	8	16	41	29	15	10	6	0	**134**	**6.79**
Information Sources and Services	0	1	1	0	3	5	32	13	13	14	20	1	**103**	**5.22**
Others	0	1	1	3	3	8	27	20	15	7	17	1	**103**	**5.22**
Collection Development	0	0	0	7	5	10	12	13	12	12	13	0	**84**	**4.26**
Resource sharing and Networking	0	0	3	2	1	8	14	18	8	6	9	0	**69**	**3.50**
Growth and Development of Different Types of Libraries 1 0			0	3	2	7	22	10	10	6	2	0	**63**	**3.19**
Citation Analysis	0	0	0	2	2	3	11	7	5	1	4	1	**36**	**1.82**
Social Networking	0	0	2	2	0	2	4	5	4	7	6	0	**32**	**1.62**
LIS Education	1	0	1	1	2	0	6	7	3	3	3	0	**27**	**1.37**
Total													1973	100

Table 5 provides a comprehensive understanding of the preference and distribution of research themes in LIS field. For thematic analysis, all 1973 doctoral research topics were grouped under 13 broad subject headings. Research areas where less than 20 researches were carried out are grouped under the heading "Others". Table 5 projects the subject headings of theses where User Study / User Education have been found to be the most popular area of research with 527 (26.71%). Metric studies which include Bibliometrics/ Scientometrics/ Webometrics/ Infometrics and Productometrics studies taken together have been found to be the second most popular area of research with 269 (13.63%) Ph.Ds. In the digital age the wider application of Information Technology for the effective operation of Library and Information Centres is quite common. This has reflected in the

doctoral research trends as 229 (11.61%) researches were focused on topics on automation. Knowledge Management found to be the fourth preferred area of research followed by Human Resource Development and Management and Library Management which have almost equal share of distribution i.e. 135 (6.84%) and 134 (6.79%) respectively. LIS education happened to be the least preferred area of research during the period of study.

5.6 Preferred and Emerging Sub-Domain of Research in LIS

The findings indicate that there is a shift in preferred areas of LIS research in the digital age with change in the nature and functions of libraries from traditional to IT enabled services. An in-depth analysis of the area of research based on the title of the theses suggests that most prevailing areas of research are Application of ICT 229 (11.60%), Information Need and Seeking Behaviour 220 (11.15%), Metric Studies 267 (Scientometric Study 146, Bibliometrics 97, Webometric Study 24 - 13.53%), Collection Development 84 (4.25%), Resource Sharing and Networking 69 (3.49%) and Information Literacy 56 (2.83%). As the research traditions in the

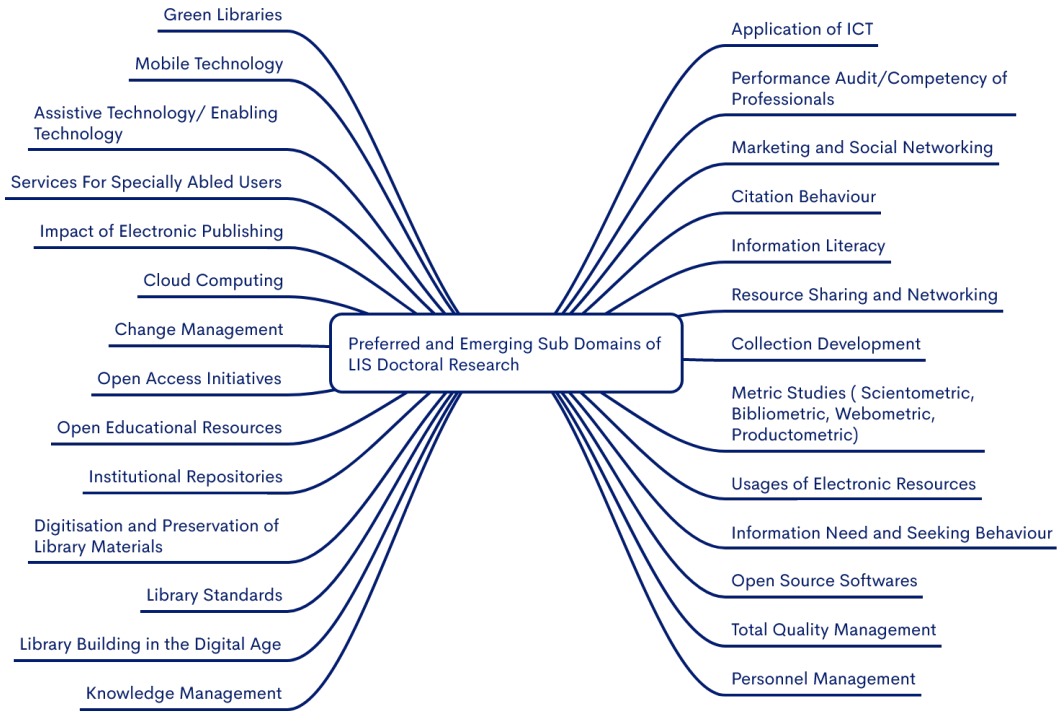


Figure 2:- Popular and Emerging Sub Domains of LIS Research

LIS field are continuously evolving with the development of new technologies, there were some emerging areas of research came to the notice viz. Productometric Analysis (1), Green Libraries (1), Mobile Technology (2), Assistive Technology/ Enabling Technology (3), Electronic Publishing (3) among others. In the light of the impact of technology, the physical space utilisation and construction of library building had attracted the researchers as 5 theses are found to be based on this aspect. Change Management (5), Services for Specially Abled Users (6) and Performance Audit/Competency of Professionals (27) in the digital age are also found to be the thrust areas of LIS research. Figure 2 illustrates some of the preferred and emerging areas of LIS doctoral research.

5.7 Gender-wise Distribution of Research Scholars of LIS Research

Table 6:-Gender-wise Distribution of Research Scholars

S. N.	Gender	Number	Percentage
1	Female	623	30.92%
2	Male	1214	60.25%
3	Could not be ascertained owing to lack of full name	178	8.83%
Total		2015	100

The under-participation of women in higher education has been clearly documented in many literature and even government reports. As per the All India Survey on Higher Education (AISHE) report, in the past six years from 2013-14 to 2017-18 from students to faculty, across streams, women's participation has grown in institutions. Through various initiatives by the government, an overall increase in the enrolment of women in higher education is clearly visible. This has been reflected in the Gender Parity Index (GPI) which has been increased from 0.92 in 2013-14 to 1 in 2018-19 ((AISHE)). However from the Table 6 the disparity in gender distribution can be seen for research scholar in LIS. Out of total number of researchers about 60.25% are male researchers and almost half of it about 30.92% is female researchers. Gender of 8.83% researchers could not be ascertained owing to lack of full name and given to the variety of Indic names.

6. Discussion and Conclusion

The LIS doctoral research field has a long history and the last 30 years have brought significant advances to the discipline in India. Every so often it is essential that these advances are noticed and trends assessed. These trends are systematically studied here in via theses available in the Shodhganga database. This study identified the

most popular as well as the emerging areas of research during the last about 10 years which can play a pivotal role in determining the main path of research in the field. A good number of studies are found be carried out on the latest technologies but there is a need of more and more research on this aspect given to the pace of technological developments. Employability of the LIS graduates has always been a debatable topic. Hence more research on the status of LIS Education and Curriculum Development keeping in view the competency required in the digital age is the need of the hour. However a meagre number of studies have focused the aspect. In LIS doctoral research, English was found to be most preferred language for theses writing. However, some theses written in other languages such as Hindi, Marathi, Guajarati and Bengali are also being noticed. Though a total of 111 universities are activity contributing to the doctoral research in India out of which 2 universities have more than 100 researches to their credit, almost half (48.64%) of the universities have contribution of less than 10 researches each. It was also observed that 546 research supervisors are presently engaged in guiding doctoral students out of which 25 have guided as co-guide only. It is worth noting that there search areas in LIS bear a good testimony of its importance and necessity of the time. It will be useful to identify those research areas that are needed most keeping in view the changing landscape of the Libraries and Information Centres.

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Websites of State Government Universities In Madhya Pradesh: A Webometric Study

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Abstract: Webometric is measuring the the websites, webpages, Parts of Web-Pages, words in webpages,link structure, web search engine results. This study examines 24 state Government Universities of Madhya Pradesh. Investigate Domains distribution of websites, analyse number of webpages and link pages and calculate the self link web impact factor, External link web impact factor and Revised web impact factor for state Government Universities in Madhya Pradesh and Rank the websites as per the WIF.

Key Words: State Government University websites Madhya Pradesh, website Analysis, Link Analysis, internal link, External link, in link, Web Impact Factor.

1. Introduction

Digital revolution has laid a great impact on our education system. Smartphones, Tablets, Laptops, Computers are being used widely as a medium of generating and accessing information via Internet. Today Online access of information, High use of Social Media and Virtual Meetings, Webinars are the latest Trends in information usage patterns. World Wide Web has become the main source of information in research and academic activities and excellent platform to test new method of evaluating webometric activities.

A website is a set of related pages covering content such as text, image, video, audio etc. accessible via network such as the internet through on internet address call Uniform Resource Locator (URL).

2. Webometric

The term webometrics is a coinage from to modern English words, “web” and “metric”. Webometric is the study of the quantitative aspects of the construction and use of information resources, structures and technologies on www drawing on biblometrics and infometrics approaches. In 1996, Larson explained link structure

analysis with the first pure infometrics analysis of the web.[1] In 1997 Almind and Ingwersen have named quantitative studies of the web as webometrics.[2]

3. Methods of webometrics

According to Bjorneborn (2004) Webometrics study[3] covers the following main areas of construction side and usage side of the web :

- Web page content analysis ;
- Web link structure analysis (e.g.- Hyperlinks, Self-link, External link and In link) ;
- Web usage analysis (e.g.- exploiting log files for users searching and browsing behavior); and
- Web Technology analysis (including search engine performance)

4. Web impact factor (WIF)

A web impact factor is a relatively new measure of the extent to which a site is linked to by other sites, and is analogous to a citation count in the print environment. Broadly, it is a measure of the extent to which it is linked to and recognized by other sites.

Mukharji Bhaskar (2009)[5], Jeyshankar and ramesh babu (2009)[6] and ramesh Babu, jeyshankar and Nageswara rao (2009)[7] and Ramesh babu, Jeyshankar and Nageswara rao (2010)[8] studied the WIF as the ratio of number of links to the total Number of web pages.

Ingwersen Distinguished between:

- The external link WIF, the ratio of external links to the number of pages.
- The internal or self WIF, the ratio of internal links within the site to number of pages.
- the revised WIF, the ratio of in links to the target site, to the number of pages at the site.

5. State Government Universities in Madhya Pradesh

This study aims to examine 24 websites of State Government Universities in Madhya Pradesh on the basis of webomteric parameters.

Table-1 depicts the year of establishment of 24 State Government Universities in Madhya Pradesh, Rani Durgawati University was the first state university established in 1956. In the last 14 years about 12 State Government universities have been established which shows the growth of Higher Education in Madhya Pradesh. Whereas it is observed that no university came into existence during 1976-1985.

Table 1.Classification of state universities of Madhya Pradesh by year of their establishment

Year of establishment	No. of Universities	percentage
1956-1965	6	25
1966-1975	2	8.3
1976-1985	0	0.0
1986-1995	3	12.5
1996-2005	1	4.16
2006-2015	8	33.3
2016-2019	4	16.6
Total	24	100

6. Review of Related Literature

Jeyshankar, Ramesh Babu and Gopalkrishnan explained basic framework and development of webometrics from librametrics, informetrics, biblometrics, scientometrics and cybermetrics.[9]

Thelwall et..al (2002) reports on the result of a survey of the size of 670 websites of higher education institutions in countries associated with European Union as estimated by Alta Vista. It has been found that there are still enormous National differences of up to three orders of magnitude.[10]

Samir Kumar Jalal, B.Sutradhar and Parthasarthi Mukhopadhyay study top 10 Indian and Asian universities for developing new ranking system for India using appropriate webometrics indicators. They reported that Indian Universities are having 2% backlinks and 25% webpages and wiser value with respect to top ten Asian Universities.[11]

S.S. Shahruddin,RZW Chick and ISA Malik conducted a study on visibility in strategizing for web market in webometric university ranking in Malaysia (2019)[12] and found that The National Library China has the highest Domain &page authority of 67 and 73 respectively.

Jayshanker Ramalingam (2019)[13] conducted webometric analysis of 125 Deemed university websites in India.It is found that the size of the websites ranges between 1 and 8529kb,the internal link ranges between 1 and 560 links and External link ranges between 1 and 252 links.web impact factor for deemed universities websites ranges between 0.01 and 116.83.Relation between internal, External and back link has been calculated between 0.01 and 3.

Ashok Pal, Sanjoy kar & Sovan sardar conducted "A Webometric analysis of ICSSR sponsored research institution in India" (2020)[14] . This study reflects that institute of developments study Kolkata has the maximum no. of webpage's (71400). Institute of economic growth has the maximum no. of total links (177) & internal links (167). Institute for studies in industrial development has maximum no. of external links (36).Gujarat institute of development research holds the numero uno status on the basis of SWIF(0.6736) & IWIF(0.65551) Whereas Institute for studies in industrial development holds the first rank in EWIF(0.0404).

7. Objectives

The objective of the study are:

- To identify and classify the domain of State Government Universities web-sites in Madhya Pradesh.
- To find out the number of web pages, number of link pages, number of self link pages, and external link pages of State Government Universities web-sites in Madhya Pradesh.
- (iii.) To measure the simple WIF, self link WIF, external WIF and revised WIF of Madhya Pradesh universities websites in Madhya Pradesh.

8. Hypothesis

The following hypothesis are coined for this study:

- A majority of State Government Universities in MP have hosted websites on the internet.
- Higher the number of webpages, smaller the link pages and greater the WIF, smaller the number of webpages.

9. Scope and Limitations

This study makes a webometric analysis of State Government Universities in Madhya Pradesh. There are 24 state universities in Madhya Pradesh.The study covers the website of State Government universities in Madhya Pradesh listed under 12-B of UGC act 1956 Section 3 of UGC act and section 2(f) and 12(B) of UGC act upto December 2020 only.

10. Methodology

The present study has been carried out by using webometric methods. Data were collected from 24 state government universities websites. The search engine Bing index checker has been used to collect the number of web pages of each website. Web optimization Tools were used to collect number of self link , external link and in link.

11. Web Impact Factor

WIF has been calculated by following formula -

$$\text{Self link WIF} = \frac{\text{Total no. of self link pages}}{\text{Total no. of web pages}}$$

$$\text{External link WIF} = \frac{\text{Total no. of external link}}{\text{Total no. of WebPages}}$$

$$\text{Revised WIF} = \frac{\text{Total no. of in links}}{\text{Total no. of WebPages}}$$

Table 2 reveals that 7 types of 'domain extensions' were observed in this study. '.ac.in' has been widely used in websites of State Government Universities (46%) followed by .org and .com (16.6% both) .edu.in is used by 12.5% universities where as only 4.1% universities use .edu,.in and .net respectively.

Table 2. Classification of State Government Universities Websites by the Domain Extensions

Domain	No. of Universities	percentage
.ac.in	10	41.6
.com	4	16.6
.org	4	16.6
.edu.in	3	12.5
.edu	1	4.1
.in	1	4.1
.net	1	4.1
Total	24	100

Table 3 shows the distribution of self-link impact factor of State Government Universities in Madhya Pradesh. It is observed that Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal secure 1st rank with 0.8194% of self link WIF. Maharaja chhatrasal, Chhatarpur and Rajmata Scindia krishi university, Gwalior occupies second and third rank with 0.6923% and 0.0662% self-link WIF respectively. Jawaharlal Nehru krishi University Jabalpur, B.R. Ambedkar University, Mhow, Sanchi University, Sanchi, Nanaji Deshmukh veterinary science University, Jabalpur, Maharshi Panini Sanskrit and Vedic Vishwavidyalaya, Ujjain and Barkatullah University, Bhopal secured 4th, 5th, 6th, 7th, 8th and 9th position with 0.0476, 0.0458, 0.0456, 0.0451, 0.0389 and 0.0372 self-link WIF. Whereas Chhindwara University, Chhindwara with 0.000% self link WIF secured 29th Rank.

Table 4 reveals the distribution of external link web impact factor of State Government Universities of Madhya Pradesh. It is observed that Maharaja Chhatrasal University Chhatarpur ranked 1st with 0.1474% EWIF, Atal Bihari Vajpayee Hindi Vishwavidyalaya Bhopal, Devi Ahilya University Indore secure 2ND and 3rd position respectively with 0.0416 and 0.0125 EWIF . Jawaharlal Krishi University Jabalpur and Nanaji Deshmukh veterinary university Jabalpur share 4th rank with 0.00 94 EWIF each. sanchi University Sanchi, Barkatullah University Bhopal, Rajmata Scindia University Gwalior, Maharshi Panini Sanskrit evam Vedic University Ujjain, and Pandit S.N. Shukla University Shahdol, occupy 5th, 6th, 7th 8th and 9th rank respectively with 0.0093%, 0.0081% , 0.0073%,0.0056% and 0.0033% EWIF.

Whereas Chhindwara University, chhindwara obtained 20th position with 0.0000% EWIF.

Table 3.Self-link web impact factor for state government universities of Madhya Pradesh

Name of Universities	No. of WebPages (A)	No. of self link Webpage (B)	Self-link web impact factor (B/A)	Ranked by SLWIF
Atal Bihari Vajpayee Hindi university, Bhopal	144	118	0.8194	1
Maharaja Chhatrasal university,Chhatarpur	156	108	0.6923	2
Rajmata vijayaraje Scindia Krishi vishwa vidyalaya, Gwalior	1780	118	0.0662	3
Jawaharlal nehru krishi vishwavidyalaya ,Jabalpur	5730	273	0.0476	4
Dr. Bhimrao Ambedkar University of Social Science, Mhow	3120	143	0.0458	5
Sanchi University of Buddhist and Indic studies ,Sanchi	1600	73	0.0456	6
Nanaji Deshmukh Pashu Chikitsa Vigyan University, Jabalpur	2970	134	0.0451	7
Maharshi Panini Sanskrit evam Vedic Vishwavidyalaya,Ujjain	1600	62	0.0387	8
Barkatullah University, Bhopal	3440	128	0.0372	9
Dharmashala national law University, Jabalpur	2450	74	0.0302	10
Madhya Pradesh Medical Science University, Jabalpur	4180	119	0.0284	11
Pandit S.N. Shukla University, Shahdol	3020	37	0.0122	12
Rajiv Gandhi Proudyogiki University, Bhopal	7560	84	0.0111	13

Makhanlal Chaturvedi National University Of Journalism And Communication, Bhopal	7060	77	0.0109	14
Awdesh Pratap Singh University, Rewa	9650	104	0.0107	15
Jiwaji University, Gwalior	10800	110	0.0101	16
National Law University ,Bhopal	7370	71	0.0096	17
Raja Mansingh Tomar Music And Arts University, Gwalior	7910	57	0.0072	18
Rani Durgavati University, Jabalpur	18400	121	0.0065	19
Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot	1880	11	0.0058	20
Devi Ahilya University, Indore	14200	52	0.0036	21
Vikram University, Ujjain	11600	34	0.0029	22
Mp Bhoj Open University, Bhopal	16900	35	0.0020	23
Chhindwara University, Chhindwara	0000	67	0.0000	24

Table 4.External link web impact factor for state government universities of Madhya pradesh

Name of Universities	No. of WebPages (A)	No. of External linkWebpage (C)	External link web impact factor (C/A)	Ranked by ELWIF
Maharaja Chhatrasal Bundelkhand University, Chhatarpur	156	23	0.1474	1
Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal	144	6	0.0416	2
Devi Ahilya University, Indore	14200	178	0.0125	3

Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur	5730	54	0.0094	4
Nanaji Deshmukh Pashu Chikitsa Vigyan University, Jabalpur	2970	134	0.0094	
Sanchi University Of Buddhist And Indic Studies, Sanchi	1600	15	0.0093	5
Barkatullah University Bhopal, Bhopal	3440	28	0.0081	6
Rajmata Vijayaraje Scindia Krishi Vishwa- Vidyalaya, Gwalior	1780	13	0.0073	7
Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya, Ujjain	1600	09	0.0056	8
Pandit S.N. Shukla University, Shahdol	3020	10	0.0033	9
Dr Bhimrao Ambedkar University Of Social Science, Mhow	3120	10	0.0032	10
Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal	7560	22	0.0029	11
Madhya Pradesh Medical Science University, Jabalpur	4180	09	0.0021	12
Awdesh Pratap Singh University, Rewa	9650	16	0.0016	13
Dharmashala National Law University, Jabalpur	2450	04	0.0016	
Jiwaji University, Gwalior	10,800	15	0.0013	14
Rani Durgavati University, Jabalpur	18,400	23	0.0012	15
Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot	1880	01	0.0005	16

Makhanlal Chaturvedi National University Of Journalism And Communication, Bhopal	7060	03	0.0004	17
Raja Mansingh Tomar Music And Arts University, Gwalior	7910	03	0.0003	18
Mp Bhoj Open University, Bhopal	16,900	04	0.0002	
Vikram University, Ujjain	11,600	03	0.0002	19
National Law University, Bhopal	7370	02	0.0002	
Chhindwara University, Chhindwara	0000	26	0.0000	20

Table 5. Revised link web impact factor for state government universities of Madhya Pradesh

Name of Universities	No. of WebPages (A)	No. of Revised-link Webpage (D)	Revised-link web impact factor (D/A)	Ranked by RLWIF
Maharaja Chhatrasal Bundelkhand University, Chhatarpur	156	10364	66.43	1
Atal Bihari Vajpayee Hindi Vishwavidyalaya, Bhopal	144	5007	34.77	2
Barkatullah University Bhopal, Bhopal	3440	68969	20.04	3
Devi Ahilya University, Indore	14200	24,3222	17.12	4
Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal	7560	92556	12.24	5
Jiwaji University, Gwalior	10,800	63561	5.88	6
Rani Durgavati University, Jabalpur	18,400	92259	5.01	7

Makhanlal Chaturvedi National University Of Journalism And Communication, Bhopal	7060	26859	3.80	8
Mahatma Gandhi Chitrakoot Gramoday University, Chitrakoot	1880	5262	2.79	9
Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior	1780	4969	2.79	
Awdesh Pratap Singh University, Rewa	9650	22,114	2.29	10
Mp Bhoj Open University, Bhopal	16900	33,294	1.97	11
Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur	5730	11052	1.92	12
Vikram University, Ujjain	11600	6218	1.64	13
Raja Mansingh Tomar Music And Arts University, Gwalior	7910	10,528	1.33	14
Maharshi Panini Sanskrit Evam Vedic Vishwavidyalaya, Ujjain	1600	2061	1.28	15
Madhya Pradesh Medical Science University, Jabalpur	4180	5152	1.23	16
Sanchi University Of Buddhist And Indic Studies, Sanchi	1600	1588	0.99	17
National Law University, Bhopal	7370	4741	0.64	18
Nanaji Deshmukh Pashu Chikitsa Vigyan University, Jabalpur	2970	1843	0.62	19
Dr Bhimrao Ambedkar University Of Social Science, Mhow	3120	1850	0.59	20

Dharmashala National Law University, Jabalpur	2450	459	0.18	21
Pandit S.N. Shukla University, Shahdol	3020	129	0.04	22
Chhindwara University, Chhindwara	0000	06	0000	23

Table 5 Shows the rank distribution of state government university in Madhya Pradesh according to revised web impact factor (RWIF), Maharaja Chhatrasal University Chhatarpur ranked 1st with 66.43% RWIF . Atal Bihari Vajpayee Hindi Vishwavidyalaya Bhopal and Barkatullah University occupied 2nd and 3rd position with RWIF 34.77% and 20.04% respectively. Devi Ahilya University Indore, Rajiv Gandhi prodyogiki University Bhopal, Jiwaji University Gwalior, Rani Durgavati University Jabalpur secured 4th 5th, 6th and 7th rank with 17.12%, 12.14%,5.88% 5.01% and 3.80% RWIF. Whereas Mahatma Gandhi University Chitrakoot and Rajmata vijayaraje Sindhiya University Gwalior, shares the 9TH position with 2.79% RWIF each. Chhindwara University Chhindwara secured 23rd position with 0000 RWIF.

12. Conclusion & Recommendations

The universities websites can be used as a communicative bridge between institution's achievements and their services to their audiences by keeping them abreast with the latest news, announcements, changes in policy, starting of new courses and services .This study emphasized on the Internal link, External link and In link Web Impact Factor for each website of State Government Universities in Madhya Pradesh, It is recommended that the websites of State Government Universities need to build good numbers of in links for having a higher In link WIF.

This study could be extended by comparing universities of state versus state and between the countries.

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Research Data Management: A Learning Trail for Beginners

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Abstract: The scientific process is enhanced by managing and sharing research data. There is a growing awareness of the importance of research data in the scholarly world. Research Data can be described as any information that has been collected, observed, generated or credited to validate original research findings. Researchers require infrastructures that ensure maximum accessibility, stability and reliability to facilitate working with and sharing of research data. The rapid development in the field of research advocated the implementation of Research Data Management. Research Data Management is part of the Research process and aims to make the research process efficient. It aims to ensure reliable verification of results and facilitates future reuse and sharing. Managing Research Data can help to increase transparency, make data accessible, save time and reduce the risk of data loss. Research Data Management describes the organization of data from its entry to the research cycle through the dissemination and archiving of valuable results.

The purpose of this paper is to offer a birds-eye view of different activities and processes associated with the research data lifecycle, besides, discussing different stages of genesis and significance of Research Data Management. Furthermore, the paper shall provide a synthetic overview of leading online Research Data Management platforms that can be employed for data management purposes. It will also shed light on the strengths and weaknesses of these platforms. Thus, paper can be very useful for the researcher community and information professionals alike in understanding the nitty gritty of fast emerging domain for data management and preservation.

1. Introduction

The scholarly papers are getting published in abundance, and there is a growing awareness of data generated in the research field. The growth has attracted new models and publishers of the data (McNutt, 2013). Scholarly publishing has become much diverse and evolves the practice of scholarly communication. The management and dissemination of research data is a concern for both research institutions and the researchers who streamline scholarly communication (Lynch, 2003). Research data needs to be carefully indexed and stored so that it

becomes visible to scientists and other potential users (Heidorn, 2008). Academic institutions have new mandates viz open access of research data, coordination between relevant databases that allows the effective exchange of data between organizations and the scientific community. The strongest initiative for the generation of open research data is the ability for the scientific community to find and access data easily, free of charge and re-use it either to discover new opportunities in the research field or reproduce experiments to allow scientific breakthroughs (Guedj & Ramjoue, 2015). Data curation involves the active and ongoing management of data through its lifecycle, it includes the application of metadata, assigning permanent identifiers to datasets making data more accessible, easier to understand and preserve for long-term access (Carlson, 2014). Curating data and making it available for reuse, preservation and sustainability require significant planning and investment of effort throughout the data lifecycle. This process of managing data led to the development of Research Data Management (Yu , Deuble &Morgan,2017). Research Data management can be defined as "all data practices, manipulations, enhancements and processes that ensure that research data are of a high quality, are well organized, documented, sustainable, accessible and reusable" (Corti, Van den Eynden, Bishop & Woollard, 2019). Research workflow and management process varies not only from discipline to discipline but also from one institution to another implying that majority of researchers desire technical infrastructure and project-specific support for research data management (Wissik & Durco, 2016). The research data management is a continuous process and involves a series of steps viz, formatting and organizing data, storing and transferring data, rights related to research data, various legal and ethical issues in sharing data management strategies for research managers, making use of other people's research data, preserving and publishing data (Corti, Van den Eynden, Bishop & Woollard, 2019).

Research data take many forms and are often difficult to interpret once removed from the initial context. The efforts required for creating metadata for the research dataset are very different from what is required for research publications. Good quality metadata for the dataset requires the involvement of researchers in its production. Knowledge of the domain is a pre-requisite for the dataset production, specific metadata requirement and preservation guidelines (Borgman, 2012). Various platforms are set in place by institutions to support Research Data Management workflow. It starts by identifying various well-known repositories that are used either for data publications or data management. It emphasizes their fitness to manage research data, implementation cost, interoperability, content dissemination capabilities and preservation strategies for domain-specific

metadata requirements (Amorin, Castro, Silva & Ribeiro, 2017). Repository service is more successful when constructed with user and reader in mind, high value to specific scholarly communities is essential implementing that repositories are more useful to the scholars when they offer dedicated services supporting the production of new knowledge, access and use of services, and preservation of content and sustainability of service (Armbruster & Romary, 2010). Institutions that allow self-archiving and use open-source application requires a long term commitment to safeguarding, preserving, and making accessible the intellectual content of one's institution. Unfortunately, the costs associated with implementing and managing research repositories are very high (Burns, Lana & Budd, 2013). Researchers regard simple data backup so that they can perform on their own at a very low cost and state data access features to encourage self-deposit of data. Other researchers may reuse the preserved data as a base for secondary research (da Silva, Ribeiro & Lopes, 2011). Significant standards like the open archives metadata harvesting protocol are now in place; some progress has also been made on the standards for the underlying metadata itself and repositories are now affordable. These activities are invariably supported by research data management platforms, increasing the demand for such infrastructure (Ball, 2012).

2. Research Data Lifecycle:

The research lifecycle is a process that a researcher takes to complete a study from inception to its completion. The lifecycle is an indicator of processes that helps the researcher to complete the study (National Library of Medicine, 2020). The lifecycle model provides the context in describing data stewardship activities that manage the course of the research project (Oregon state university, 2020). The University of Oxford (2020) defines research data as "the recorded information (regardless of the form or the media in which it may exist) necessary to support or validate a research project's observations, findings or outputs, or which is required for legal or regulatory compliance". Humphery (2006) represented the lifecycle of the research process through "a series of sequentially related phases by which information is produced or manipulated". Research universities are continuously concerned with providing comprehensive support, developing opportunities to meet the demands of today's curriculum and technologies. The new ways to access and advance the research process need to be adopted. The research library must be a key partner in this changing environment (Covert-vail & Collard, 2012). Data curation and management skills would aid in the continuous development of data management curriculum and professional development (Creamer, Morales,

Crespo, Kafel & Martin, 2011). According to Pouchard (2016) the Research data lifecycle includes planning, acquiring, preserving and re-discovering data and assuring quality as an integral part of the lifecycle. Libraries need to remodify themselves by responding to the growing demands to manage, store, curate and preserve data. New tools and knowledge need to be implemented to meet the expectation related to data curation. Linking data is a rich and robust way to support data reuse and integration (Gold, 2007). Researchers recommend a flexible research lifecycle to match the service needs of different individuals and the skills of different librarians. Thus enabling a large number of niche services to the majority of researchers in a scalable fashion (Vaughan et.al, 2013). In addition to different phases of the research data cycle, there are other activities that are performed continuously such as documentation of workflow process, provision of metadata and backup of data to prevent data loss. The data models differ widely in granularity, complexity, presentation, and community perspective (Faundeen et.al, 2013). Research data management is "a general term used to organize, structure, store, and care for the information used or generated during a research project". It deals with the planning of data and requires data management plans, deals with information on day to day basis, meets funding and regulatory body requirements and research data remains accurate, authentic, reliable and complete (University of Oxford, 2020).

The model describes the phases associated with the research lifecycle. In academic research data is considered as any output obtained from systematic observation and involving a process of observation, experiment and testing of hypothesis which when assembled in context and interpreted rightly will produce new knowledge. Research lifecycle is the series of sequential actions enabling the discovery, creation and preservation of the research data (Pryor, 2012). The use of data lifecycle within data management is common as it helps to identify the role data plays at different stages in the research projects (Briney, 2015). The stages in the lifecycle model instruct researchers about different steps they should take while doing research (Ray, 2014). Various phases associated with research data lifecycle are:

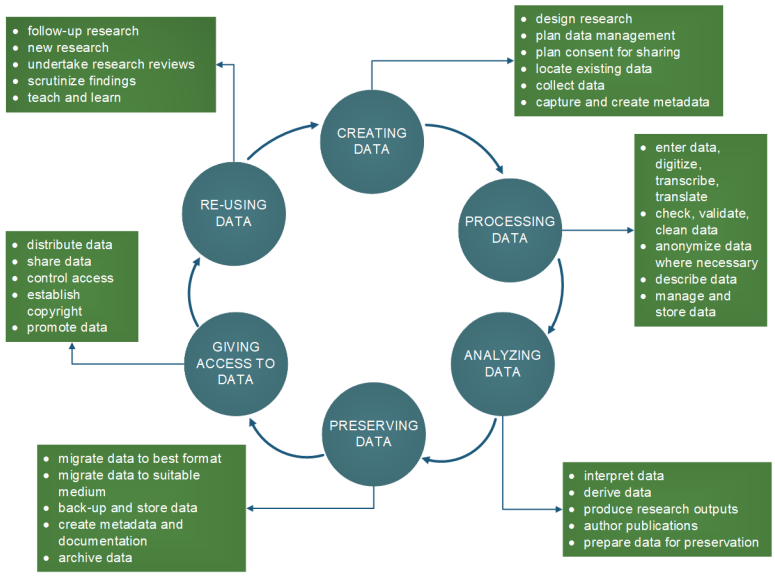


Figure 1: UK Data Archive Research Data Lifecycle Model

Step 1: Creation of data:

Universities encourage all researchers and postgraduate students, to frame a data management plan and ensure all aspects of data management are fully considered at the beginning of the research project. It identifies different collaborators, finds funding opportunities, and gain other support to help in the research proposal and planning process (UCF libraries, 2020). It begins with conceptualization, involves the planning for data generation, how data needs to be stored, discusses budget allotted for curation, and how collected information is important for curation (Ball, 2012). Creation of data involves new data collection, reuse of existing data, creation of metadata (NTU Library, 2020). Data management plan helps in designing research data, how it is to be collected, organized and used to achieve longer sustainability (Corti, Van den Eynden, Bishop & Woollard, 2019). In the initial phase, the structuring of the hypothesis and planning of the research program is taken into consideration. This phase is the principal source for new data arising from investigation or experimentation (Pryor, 2012).

Step 2: Processing of data:

Indicates which data needs to be shared at what stage and identify the resources (hardware, commercial services, campus services and disciplinary services), describe the plan for storing data. (libguides.mines.edu, 2020). Data occupies an important place during the processing and analysis part. Processing strategies

include file naming, document conventions and usage of the database (Briney, 2015). Methods and equipments are required for managing research data, metadata is assigned to data and helps others to interpret and reuse the findings. Various file folders and naming structures are documented (JISC, 2020). Data processing includes a set of structured activities that result in the integration of data. It is essential for reproducibility and improves transparency (USGS, 2020).

Step 3: Analyzing data:

The analysis stage of the data lifecycle represents various activities associated with the exploration and assessment of data here hypotheses are tested, data is discovered and conclusions are drawn (USGS, 2020). Interpretation of data is done using appropriate metadata standards, potential data is obtained that can be readily analyzed (dataone.org, 2020). It also includes putting someone in charge of the dataset and its maintenance (JISC, 2020). The processing and analysis cycle includes a typical research project workflow. It provides services like analysis support, collaboration tools and identifies collaborators, experimental projects, data output and conclusions (Eden, 2015). The analysis stage of the data lifecycle manages the difference between raw and analyzed data, performs data control and spreadsheet practices (Briney, 2015). In this phase, data is exploited and analyzed to draw new conclusions (EL-Arass & Souissi, 2018).

Step 4: Preserving Data:

Preservation of data deals with appropriate long-term preservation of data (dataone.org, 2020). Preservation involves various actions and procedures related to data for future use and includes data archiving or submission to the data repository (USGS, 2020). Preservation activities involve assurance of data, creation of metadata records with Digital Object Identifiers (University of Reading, 2020). It also involves quality control, registering structural and semantic metadata, ensures data remain secure (Ball, 2012). Assignment of metadata, research data computing services, open access hosting and discovery service are the necessary actions for the preservation and curation of data (Pryor,2012). The lifecycle stage of data sharing and preservation require long-term storage. It examines which data to retain, how to retain it, prepare data for long-term storage and outsource preserved data to a data repository (Briney, 2015).

Step 5: Giving access to data:

Data from various sources are combined giving access to a homogeneous set of data. The generated data is made available for different research activities (Corti,

Van den Eynden, Bishop & Woollard, 2019). Access to the data can be given publically or restrictions on access can be imposed (University of Reading, 2020). Data curation service will include the application of metadata to make data more accessible, it enables discovery and citability by assigning permanent identifiers to the datasets (Carlson, 2014). It maximizes the use of data, increases the impact of findings, expands the progress of research faster and farther, and expands the scope of research (Borgman, 2012). It confirms metadata is captured and maintained for access and increases the credibility (El-Arass & Souissi, 2018).

Step 6: Re-using Data:

Indicate data can be reused for academic purpose, it increasing the credibility of original data and provides a single, easy-to-use, user guide for future research (Corti, Van den Eynden, Bishop & Woollard, 2019). Different steps associated with the reuse phase are the availability of resources in various forms, partly as raw data, partly within complex web applications and allowing searching and browsing through different dimensions (Wissik & Durco, 2016). Data made available can be used by other researchers either to authenticate original research findings or generate new insights (University of Reading, 2020). It includes a legal framework for sharing data, licenses and contracts, patents and copyright (Briney, 2015). The last function is perhaps the most crucial as existing data that will be gathered and reviewed for new research. It will provide authoritative benchmarks for the use and reuse of data (Pryor,2012). The utilization of the life cycle model for Research Data Management will be helpful for long-term access.

Some Research data Management platforms:

1. Re3data.org

Registry of Research data repository started in 2012 and funded by the German Research Foundation. It is a global registry of research data repositories from various academic disciplines and promotes sharing of data in order to increase the visibility of research data and offers permanent storage and access to research data (re3data.org, 2020). It provides general information about the research data repositories, information related to the responsible institution of the repository, legal issues concerning upload and access regulations and technical aspects such as persistent identifier system and application programming interfaces (Kindling et.al, 2017). Re3data represents the heterogeneous Research data repository landscape and helps in identifying particular repository for storage and access of research data (Pampel et.al, 2013).

2. UK Data Service

UK data service is funded by the Economic and Social Research Council (ESRC). The service incorporates collection for UK government surveys, census data, business data and qualitative data. It provides access to social and economic data, support for the public and commercial sector, and data preservation and sharing standards (UK Data Service, 2020). ReCollect and ReShare allows institutions associated with UK Data archive to store, discover and disseminate social science and humanities data collection (Van den Eynden, Ensom, Wolten & Corti, 2014). Long-term preservation, data with quality standard, regular back up of data, online resource discovery, and access to the data, and licensing arrangement are some of the advantages of UK Data Archive (Van den Eynden, Corti, Woollard, Bishop & Horton, 2011).

3. Figshare

Figshare repository offers research output in a citable, sharable and discoverable manner since 2012. It helps to organize academic research and make the best impact of it, controls institutions research output with private storage, public storage and collaborative spaces (figshare.com, 2020). Figshare is the brainchild of Mark Hahnel, its facility to upload figures, media or dataset is proficient. Access to the content is provided by free registration. Different data categories are uploaded by figshare ensuring efficient search and long-term access to the data (Singh, 2011). Figshare is the natural site for data, it is not limited to any particular research type or particular discipline and people from various disciplines found effective use of the repository (Thelwall & Kousha, 2016).

4. Zenodo

Zenodo is a multidiscipline repository maintained by CERN (The European Organization for Nuclear Research) launched in 2013. Digital Object Identifier (DOI) is automatically assigned to Zenodo files and researchers from any discipline can upload data in any file format (zenodo.org, 2020). Zenodo's data records are indexed in various other databases, DOI and open access provided by Zenodo has increased its usage (Peters, Kraker, Lex, Gumpenberger & Gorraiz, 2017). Zenodo's data model is available in multiple machine-readable formats and provides researchers with a stable platform to archive, publish and share their data (Dillen, Groom, Agosti & Nielsen, 2019)

5. Dryad

Dryad is a general-purpose international data repository underlying peer-reviewed scientific publications. It makes the research data discoverable, reusable

and citable. It provides data visibility and data quality by making research data openly available, integrated with scholarly publications, and continuously reusable (Dryad, 2020). The applicability of the lifecycle model in Dryad's repository enhances understanding of metadata, aid communication about the topic of metadata and robust the development of the repository (Greenberg, 2009). This repository adopted joint data archiving policy (JDAP) for publication, data archiving and management (Massimiliano, Leonardo, Donatella & Alice, 2016).

Conclusion

In this paper we presented the importance of research data, its management and some of the platforms useful for preserving and sharing research data. Managing research data brings benefits not only to the project but to future researchers and wider society. Good data management increases transparency, makes data accessible, saves the time of the user, reduces the risk of data loss and facilitate future reuse and sharing, and improves citations. Data management is important for the data workflow. Research data Management benefits researchers by providing support services. Starting from research data lifecycle to research data management we discussed the different phases and scenarios associated with Research lifecycle, a generous amount of literature related to Research data management were identified. The paper focused on research data to be deposited in various research data management repositories as the final location for data curation, sharing and long term preservation. Thus, this paper can be very useful for the researcher community and information professionals alike for data management and preservation.

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To Assess the Level of Users Satisfaction with Library Resources and Services: a Case Study PGIMS Rohtak

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Abstract: This study investigated users' satisfaction with library information resources and services at the PGIMS Rohtak. The objective was to determine the level of user's satisfaction with library information resources and services. 2 (two) research questions were formulated to guide the study. The survey research design using a population of 1200 registered users in the institute. The sample size of 180 was selected through random sampling technique with the help of questionnaire.

Keywords:

1. Introduction

Education is key factor in development and advancement of society. The need for information in education is unlimited. Scholars, educators seek and use information from different sources and formats for a variety of tastes. The information generally used for enhancing knowledge in the profession and education as well as decision making, discovering new concepts, new technologies by conducting research using technologies. In short information plays a role in reshaping human thinking. Tremendous growth in Knowledge is reported as well as technological advancement and rapid changes led to necessity and awareness of information published in all formats. Academic, professional, research institutions play a key role in society by generating knowledge for future generations. The libraries associated with academic institutes serve as backbone and serve to variety of users like students, faculty, researcher, administrators etc. having diverse need of information. Libraries collect variety of published information and offer library services to support instructional, teaching and learning, study material, resources and learning activities. Importance of libraries in academic, professional, research institutions is considerable and termed as backbone of educational system.

Zeithman and Bitmar (2000) defined users' satisfaction as the means by which users determine that a product or service meets the required benchmark. If

the products or services do not meet their needs or expectations, it is therefore assumed that they are dissatisfied with the product or services.

Similarly, Iwhiwhu and Okorodudu (2012) explained that users' satisfaction of library information resources and services is a way in which users judge the adequacy of the library information resources and services rendered to them and also if their expectations are provided to them. Library user satisfaction implies how users feel after using the information resources and services and their willingness to return to the library when next they need information (Ikenwe and Adegbilero-Iwari, 2014).

According to Ijiekhuamhen, Aghojare and Lerdinand (2015) the level of using the library depends on users' satisfaction with the available information resources and services rendered to them.

2. Need for Study

In any institutions libraries are known for providing information resources and services to support teaching, learning, research and community services. Therefore the quality of information resources and services rendered should be standard to meet the users' expectations. It is through the users that librarians can determine if the library information resources and services rendered to users are satisfactory or not. Without the users patronizing the library information resources and services will look like a warehouse. Therefore, investigating users` satisfaction with library information resources and services will determine the level of satisfaction of library resources and services for future developments. It is in the light of the above that the researchers wish to answer the question; are users of PGIMS Rohtak satisfied with the information resources and services rendered to them?

3. Objective

The following research questions were formulated to guide the study.

1. What is the level of users' satisfaction with library information resources in PGIMS Rohtak?
2. What is the level of users' satisfaction with library services in PGIMS Rohtak?

4. Review of Literature

According to Igben (1993) a library is most functional if the services provided correspond closely with the information needs of its users. Edem and Edem (2002) conducted a study on the level of utilization of reference information resources in the University of Calabar Library. Two hundred and fifty (250) respondents returned usable questionnaires. The findings showed that 127(50.80%) respondents were satisfied with the quality of reference information sources services, but 73(29.20%) respondents were neutral in assessing their level of satisfaction. With this result, it could be said that the library users were satisfied with the reference information services provided in the University of Calabar

In the same vein, a study on user satisfaction with library information resources and services in Nigeria Agricultural Research Institutes was conducted by Ezeala and Yusuff (2011) the finding shows that Users were dissatisfied with the library orientation, photocopying services, bindery services; inter library loan services, weekend library services, electronic library information resources and internet services. It was also found that users were satisfied with the duration of loan services, opening hours of the library, the lighting system of the library and the number of computers available. It could be said that the reasons why users might be dissatisfied with inter-library loan services is that most libraries are not willing to engage in inter -library loan because the information resources they have are not sufficient for their users

5. Methodology

S/N	Satisfaction with library resources	Highly Satisfied	Satisfied	Dissatisfied	Highly Dissatisfied	Mean
1.	Library bulletin and newsletters	-	-	76	84	1.47
2.	National and international journals	24	20	53	63	2.04
3.	Books on the shelves.	16	23	45	76	1.87
4.	Comprehensive online databases resources in my subject areas.	-	-	63	97	1.39

5.	Comprehensive project and thesis collection.	-	-	91	69	1.57
6.	Comprehensive electronic resources such as CD ROMs	-	-	82	78	1.51

The research design adopted for this study was survey research design. The population of this study consists of approximate 1200 registered undergraduate library users in the PGIMS Rohtak in the 2019/2020 academic season. Out of the 1200 registered undergraduate library users, a sample size of 180 users was used. A questionnaire titled: Users Satisfaction with Information Resources and Services in PGIMS Rohtak Library, PGIMS Rohtak was used in gathering data from respondents. Four LikertPGIMS Rohtak.

6. Discussion of Findings

Out of the 180 copies of the questionnaire distributed 160 (88.9%) was retrieved, comprising 110 (68.75%) male and 50 (31.25%) female users in PGIMS Rohtak.

Research Question 1. What is the level of users' satisfaction with library information resources in PGIMS Rohtak?

Table 1. Analysis of Mean of Level of Users` Satisfaction with Library Information Resources in like scale techniques of highly satisfied, highly dissatisfied and dissatisfied were used. Data gathered were analyzed using mean and standard deviation.

Table 1 show that respondents with a mean score of 2.54 respondents accepted that they were highly

S/N	Satisfaction with Library Services	Highly Satisfied	Satisfied	Dissatisfied	Highly Dissatisfied	Mean
1.	Opening hours of the library.	74	42	34	10	3.13
2.	Operate an enquiry/reference service.	15	21	52	72	1.87
3.	Photocopying services.	6	4	68	82	1.59
4.	Inter-library loan service.	-	-	67	93	1.42

Dissatisfied with the newspaper's services in the serial section. A mean score of 2.19 respondents agreed that they were dissatisfied with the number of available computers in the library for users to source online information. A mean core of 2.08 respondents accepted that the reference materials in their subject areas were not up to date. It was also seen that a mean score of 2.04 respondents accepted that they were dissatisfied with the national and international journals because they were not up to date.

It could be seen from the table that respondents with a mean score of 1.87 respondents accepted that they were highly dissatisfied with the books on the shelves

Research Question 2 What is the level of users' satisfaction with library services in PGIMS Rohtak?

Table 2. Analysis of Mean of Level of Users` Satisfaction with Library Services in PGIMS Rohtak

5.	Library orientation services.	-	-	87	73	1.45
6.	Lending services of the library.	89	61	7	3	3.47
7.	Downloading and printing of Online resources services.	45	67	23	25	2.82
8.	Full access to subscribe database resources.	-	-	98	62	1.61
9.	Projectors lending services.	33	12	50	65	2.08
10.	Laptops lending services.	-	-	89	71	1.56
11.	Notification of conferences, seminars and workshop services.	-	-	69	91	1.43
12.	Notification of new arrival of library materials.	-	-	72	88	1.45
13.	Renewal of library materials.	67	88	3	2	3.38
14.	Bindery services.	-	-	70	90	1.44
15.	Computer literacy skill services.	-	-	50	110	1.31
16.	Current awareness services.	-	-	76	84	1.47
17.	Document delivery services.	-	-	88	72	1.55
18.	Weekend library services.	-	-	74	86	1.46
19.	Longer hours of internet services in the library.	89	50	13	8	3.37
20.	Library catalogue is user friendly.	-	-	97	63	1.61

Looking at table 2 it could be seen that the mean score of 3.47 respondents were highly satisfied with the lending services of the library. This finding is not in line with Ikolo (2015) who found out in

Delta State University library that users were dissatisfied with the lending services because they cannot borrow books from the library to use. Renewal of library materials was rated with a mean score of 3.38 respondents. Longer hours of internet services in the library had a mean score of 3.37 respondents. The opening hours of the library were rated by the respondents to be highly satisfied with a mean score of 3.13 respondents.

7. Conclusion

It is interesting to state that users of this study were not totally dissatisfied with the library information resources and services rendered to them. It was also seen from this study that there were lots of deficiencies in library information resources and services in PGIMS Rohtak. This indicates that there is a lot of work to be done in order to improve on the library resources and services rendered to library users.

Recommendations

Based on the above findings the following recommendations are made:

3. 1. There is a need to train library staff in order to improve on the library services rendered to library users.
4. 2. The library should improve on the bindery services section, computer literacy skill for users, electronic information services and photocopying services are avenues which the library can use in generating internal funds to develop its resources and services to users.

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Trends in Research through Publications of IIT Madras, (Chennai) : An Analytical Study

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Abstract: The present research carried out research-output and productivity of Indian Institute of Technology, Madras (IITM). The bibliographic data downloaded from the Web of Science Database during 2015-19. The present research highlights national and international collaboration of IITM faculties with other countries. The present paper highlights IITM's research publication productivity, forms of documents, journals preferred, international collaboration, institutewise collaboration and authorship pattern among IITM's faculties. It is observed that, IITM published publications with most collaboration of USA followed by Germany, China and more. It is noticed that, the degree of collaboration 0.983 by IITM faculties. The research productivity of IITM based on the Scientometrics indicators. The present research provides five year (2015-19) research growth and development of IITM.

Keywords: Scientometrics; Research Productivity; Research Trend; IIT Madras;

1. Introduction

Research and Development, Education sector, academic developments contribute in developing new initiatives and supports to national progress in addition to the industrial sector. DST in its report "Research and Development Statistics at a Glace- 2019-2020 (March 2020) noted that the national expenditure on R and D activities is huge and increasing every year as per the projects undertaken by educational institutes, research organisations etc. The Gross expenditure on Research and Development (GERD) has been consistently increasing order over the years in the India.

The information communication is easiest way due to internet connectivity and accessibility. Now days, tremendous literature published in the various sectors. The preset days research publications can access through various online portal. The open Access Initiative (OAI) is definitely promote research publications accessibility in the best manner. The majority of research and development

carried out in the renowned and national Importance institutes such as IITs, IISCs, IIM and more. The information is generated in the print and electronic format across the world. The majority of research publications are available at online. Hence, researcher can get information about new published very easy manner. So research community can preserve various publications at online through cloud based services. The research productivity and output is important factor for growth and development of organization. Hence, various tools and technique are available to mapped research publications in the specific fields by institutewise or individual personwise. The research productivity can analyze based on the Bibliometrics, Scientometrics, Altmetrics Study. It will help to research community for new research and development in the specific fields.

The Indian Institute of Technology's (IIT) is group of premiers autonomous public technical and research institutes / universities located across the countries. They are governed under by the "Institutes of Technology Act 1961". For this study only the research output form the IIT Madras is considered for the evaluation since it is one of the premier IIT in India established in 1959. To analyse the research trends of IIT publications the required publication data is collected form the standard and popular publication databases Clarivate Analytics's Web of Science for the years from 2015 to 2019. The data is collected and evaluated to track the research trends set up through publications and projects contributed.

A short Profile of IIT Madras

Indian Institute of Technology, Madras (IITM) is the leading engineering, research and development institute in India. IITM is a premier and recognized Institute of the country established in 1959. IITM received global recognition for research and development and education. From the annual report of IITM, it is noticed that around 2105 undergraduate students, 4112 post graduate students, 746 MS research scholars, 2963 Ph.D. research scholars, 591 faculties, 677 staff, strength is on the campus and contributed 146 patents, involved in 829 projects and more number of contribution useful to the society. (Indian Institute of Technology, Madras, 2020) IITM with the German government collaboration and with 75 German faculty and technical staff is working at IIT Madras. IIT Madras awarded Ph.D. degree jointly with international universities like the National Tsing Hua University, University of Technology Sydney and Swinburne University. IITM continuously involved in various research projects for the development of nations. Similarly, IITM has a good collaboration with industries. IITM and "Shankar Nethralaya" developed Mobile Eye Surgery facility for rural villagers from Jharkhand and Tamil Nadu States. Similarly, IIT Madras has contributed research and social projects with collaboration of industries from the various sectors. A small dairy farms automated

with the help of IoT and Cloud based technology by Stellapps. IITM produced best graduate students with pure innovative and energetic ideas. IIT Madras has a coordinator institute for NPTEL (National Programme on Technology Enhanced Learning) a joint initiative of many esteemed institutes funded by the Ministry of Education.

Methodology used

The data is collected from the SCI / Web of Science for the period 2015-2019. The data is systematically analysed and inferences are deduced from it. The main objectives of the study are to know the research publications by year-wise, forms of publications, journal preferred by faculty, national and world research collaboration and authorship collaboration pattern of IIT, Madras based on research articles. The analysis deduces various factors like output of research articles, trends of contribution national and global, nature of research articles publications, collaborations, areas preferred for publications, nature of publications preferred by IITians, average output of authors, degree of collaborations of IIT scholars with other global institutions/countries, and among other IITs etc. The scope is limited to faculty published research papers from 2015 to 2019 (both years inclusive).

Review of past Studies

Using Scientometrics different studies are conducted in the past on Indian Institute of Technology, India. Few prominent studies are**: Pradhan, B., & Ramesh, D. B. (2017)** study of Engineering research of IIT, Madras and Bombay during 2006-2015. Data collected from the International Scopus Database. Author anlayzed 5378 paper of IIT Madras and 4430 papers of IIT Bombay. **Singh, V.K. (2015)** studied research publication out of the Indian Institute of Technology (IIT) Madras from 1990 to 2014. Total number of 13208 Publication analyzed during study. International collaboration identified the highest number of papers 898 with the United States followed by Germany, South Korea. IIT Madras scientists published research in collaboration of Indian Institute of Science with 552 publications. The most prolific author was Pradeep, T. who published 240 publications. The major research areas observed Physics followed by mathematics. **Basavaraja, M. T. (2019)** investigated research productivity of IITM during 1989 to 2018 based on the Web of Science database. It is found that, the most prolific author was Ghosh, S. faculty with the highest number of publications and citations. **Wani, Z., Tahir, M. &Majeed, N. (2013)** investigated research productivity of Indian Institute of Technology, Delhi during 1964 to 2010. Data collected from International bibliographic Scopus database. This research analysed only articles and conference papers published. The total number of 15476 research papers analysed.

Other comparative study carried out of Indian Institute of Technology (IIT) based on the various metrics studies such as Scientometrics and Bibliometrics. Likewise, **Hasan, N. & Singh, M. (2015)** studied IITM Scientometrics study during 2009 to 2013 based on the Web of Science Bibliographic database. The total number of 3983 publications of IITM analysed. It is found that, international collaboration preferred by IITM to USA followed by Germany etc. **Banshal, S. K., Singh, V. K., Basu, A., &Muhuri, P. K. (2017)** investigated research performance of 16 older IITs around India. The bibliographic data collected from the Web of Science database during 1990 to 2014. The total 4905 records with 20413 citations analysed from IITM during 1990 to 2014. It was observed h-index of IITM 44. **Pradhan, B. & Ramesh, D. B., (2018)**carried out scientometrics study of six IITs during 2006 to 2015. The total 8548 publications with 82356 citations of IITM analysed based on the Scopus database. It is observed that, citation per paper for IITM was 9.63.

Scientist productivity and Research collaboration of IIT, Roorkee, has carried out by **Singh, Y. & Gupta, B. M. (2005).** They Analysed the research contribution of IIT, Roorkee from 1993 to 2001. Data collected from the web of science. The total number of 901 papers analysed. This study mainly focused on the largest 280 papers published in Engineering and Technology discipline and the lowest five papers published in clinical medicine. The Physics, Chemistry and Earth Science were the largest impact per paper recorded. It is also observed that most of the studies re up to 2014 and hence the period selected is 2015-2019.

Data Analysis and Observations

The bibliographic data analysed with the help of some software such as Microsoft Excel, VOSviwer. The IITM faculty research productivity and international collaboration analysed purely based on the downloaded bibliographic data from the Clarivate Analytics Web of Science during 2014 to 2019. The researcher has compiled the publication productivity accordingly and presented.

1. Research Publication Productivity (IITM)

The IITM faculties research publication growth found in growing order from the below Table 1. The highest publications of IITM faculties published in the year 2019 (9.55%). The IITM faculties received the maximum citations in the year 2017 (6.54%). During the recent past, the trend of publishing research is increasing every year. But it is noticed that, the average citations to publications are decreasing form 2017 drastically.

Table 1 IITM Research Publication Productivity

PY	TNP	% TNP	TNC	% TNC	ACPP
2015	1242	5.47	16069	4.49	12.94
2016	1394	6.14	14960	4.18	10.73
2017	1668	7.35	23435	6.54	14.05
2018	1885	8.31	11377	3.18	6.04
2019	2167	9.55	5527	1.54	2.55
Grand Total	**8356**	**36.82**	**71368**	**19.93**	**46.31**

***PY**= Publication Year; **TNP** = Total Number of Publications; **%ofTNP** = Percentage of Publications; **TNC** = Total Number of Citations; **%TNC** = Percentage of Total Number of Citations to Publications;**ACCP** =Average Citation Count for Publication*

2. Types of forms preferred for research communications:

The below Table 2 shows that, IITM faculties published research in the various 15th forms of documents. The IITM faculties published majority of research in forms of Journals articles, Article in proceeding paper, reviews, meeting abstracts. Simultaneously, these forms received the maximum number of citations. Similarly, **Basavaraja, M. T. (2019); Pradhan, B., & Ramesh, D. B. (2017)** found IITM first preference to journal articles.

Table 2 Preferred IITM Forms of Documents

Forms of Documents	TNP	TNP %	TNC	TNC %
Articles in Journal	7642	91.46	65809	92.21
Articles in Book Chapter	1	0.01	1	0.00
Articles in Data Paper	1	0.01	2	0.00
Articles Early Access	41	0.49	30	0.04
Articles in Proceedings Paper	244	2.92	1225	1.72
Biographical-Items	5	0.06	0	0.00
Book Reviews	9	0.11	0	0.00
Corrections	46	0.55	40	0.06
Editorial Materials	67	0.80	90	0.13
Letters	7	0.08	2	0.00
Meeting Abstracts	98	1.17	3	0.00
News Items	3	0.04	0	0.00

Forms of Documents	TNP	TNP %	TNC	TNC %
Reviews	187	2.24	4081	5.72
Review; Book Chapters	4	0.05	83	0.12
Reviews in Early Access	1	0.01	2	0.00
Grand Total	**8356**	**100.00**	**71368**	**100.00**

3. Journal Preferred

The IITM faculties published research paper in the reputed international journals. The 211 research articles contributed by IITM in Physical Review D followed by Journal of High Energy Physics, RSC Advances, Physical Review Letters, Physical Review B. The majority of journal published from USA from the below Table 3.

Table 3 IITM Journals Preferred

Name of Journals	TNP	%TNP N=8356
Physical Review D	211	2.53
Journal Of High Energy Physics	156	1.87
RSC Advances	101	1.21
Physical Review Letters	97	1.16
Physics Letters B	90	1.08
Scientific Reports-UK	69	0.83
Materials Science And Engineering A Structural Materials Properties Microstructure And Processing	65	0.78
Journal of Alloys and Compounds	65	0.78
ChemistrySelect	65	0.78
The European Physical Journal C	63	0.75
Materials Research Express	60	0.72
Transactions of the Indian Institute of Metals	57	0.68
International Journal of Hydrogen Energy	56	0.67
Physical Review E	54	0.65
Journal of Magnetism and Magnetic Materials	54	0.65
Ceramics International	52	0.62
Journal of Applied Physics	48	0.57
Physics of Fluids	48	0.57
Organic Letters	44	0.53

4. International Collaboration

The IITM faculties published maximum research with various countries. The Table 4 shows that, 14.68% IITM publications published with international collaboration with USA followed by Germany, China, South Korea, Russia and Italy. **Singh, V. K. (2015); Basavaraja, M. T. (2019); Pradhan, B., & Ramesh, D. B. (2017); Hasan, N. & Singh, M. (2015)** also observed IITM maximum research papers published with international collaborationof USA.

Table 4 IITM International Collaboration

Countries/Regions	Records	% of 8367
USA	1228	14.68
GERMANY	913	10.91
PEOPLES R CHINA	771	9.22
SOUTH KOREA	729	8.71
RUSSIA	709	8.47
ITALY	675	8.07
ENGLAND	644	7.70
FRANCE	638	7.63
SPAIN	607	7.26
TAIWAN	606	7.24
SWITZERLAND	594	7.10
POLAND	583	6.97
AUSTRIA	551	6.59
AUSTRALIA	546	6.53
CZECH REPUBLIC	530	6.33
BRAZIL	488	5.83
TURKEY	473	5.65
PAKISTAN	461	5.51
BELGIUM	460	5.50
HUNGARY	457	5.46

Visualization Presentation

The below visualization made based on the VOSviewer Software. The below Fig. 1 indicates 101 country collaboration with IITM. The higher size of circle indicates the highest number of publication collaboration with IITM.

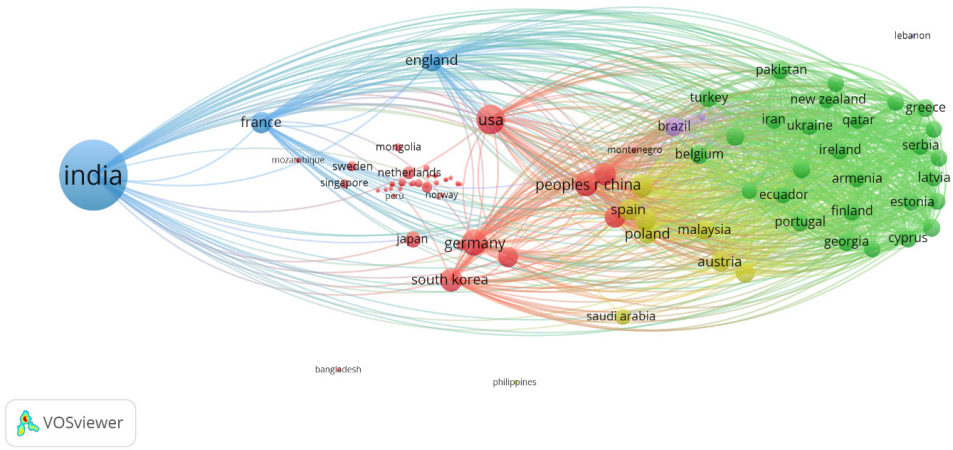


Fig. 1 Visualization Graph of International Collaboration of IITM

5. Institutewise Collaboration:

The IITM faculties 7.70% publication during 2015 to 2019 published with collaboration with national and international institutes as Russian Academy of Sciences followed by Istituto Nazionale Di Fisica Nucleare (INFN), Helmholtz Association of German Research Centres, Tata Institute of Fundamental Research (TIFR), Chinese Academy of Sciences, Centre National De La RechercheScientifique (CNRS) and Hanyang University.

Table 5 Institute wise IITM Collaboration

Name of the Organizations	Country	Records	% of 8367
Russian Academy Of Sciences	Russia	644	7.70
IstitutoNazionale Di FisicaNucleare (INFN)	Italy	642	7.67
Helmholtz Association of German Research Centres	Germany	640	7.65
Tata Institute Of Fundamental Research (TIFR)	India	624	7.46
Chinese Academy Of Sciences	China	615	7.35
Centre National De La RechercheScientifique (CNRS)	France	587	7.02
Hanyang University	South Korea	583	6.97
Institute Of High Energy Physics (IHEP)-CAS	China	573	6.85
Council Of Scientific Industrial Research (CSIR)	India	563	6.73
Moscow Institute Of Physics Technology	Russia	559	6.68

Beihang University	China	554	6.62
National Research Centre Kurchatov Institute	Russia	550	6.57
United States Department Of Energy (DOE)	US	539	6.44
University Of Turin	Italy	538	6.43
Seoul National University (SNU)	South Korea	535	6.39
Peking University	China	532	6.36
Novosibirsk State University	Russia	529	6.32
State University System Of Florida	US	523	6.25
Charles University Prague	Czechia	522	6.24
Kyungpook National University	South Korea	519	6.20

6. Authorship Pattern

The 68.57% IITM publications published by multiauthors as two, three, four authors in collaborations. It is observed that single author published less publications as compare to multiauthors. It may be IITM faculties author collaboration publication found with various institutes. The three collaborative author's published highest number of publications. Obviously, three collaborative authors received more number of citation.

Table 6 IITM Authorship Pattern

Author Count	TNP	TNP %	TNC	TNC %
1	142	1.70	479	0.67
2	2172	25.99	13246	18.56
3	2217	26.53	14628	20.50
4	1341	16.05	9681	13.56
5	713	8.53	5155	7.22
6	458	5.48	3828	5.36
7	255	3.05	2326	3.26
8	145	1.74	1408	1.97
9	91	1.09	628	0.88
10	68	0.81	777	1.09
11	22	0.26	242	0.34
12	33	0.39	220	0.31
13	6	0.07	51	0.07

14	12	0.14	117	0.16
15	5	0.06	68	0.10
16	6	0.07	219	0.31
17	3	0.04	89	0.12
18	3	0.04	43	0.06
19	4	0.05	92	0.13
20 Above	660	7.90	18071	25.32
Total	**8356**	**100.00**	**71368**	**100.00**

Degree of Collaboration by Subramanian formula:

$$\textbf{Degree of Collaboration (DC)} = \frac{\textbf{Number of multiple authors (Nm)}}{\textbf{Number of single authors (Ns) + Number of Multiple authors (Nm)}}$$

DC = 8214 / 142+8214;

DC = 8214 / 8356

DC = 0.983

As per the above Subramanyan, K. (1983) formula, the mean degree of collaboration is 0.983. It indicates that, the highest number of publications contribution within collaborative authors during 2015 to 2019. It indicates that, the highest publications of IITM faculties published in the collaboration.

Finding & Conclusions

The IIT Madras faculties had published papers in the reputed journals with international collaboration of various countries scientist, faculties and academicians. This concluding remark based on the below findings:

- The IITM faculties published total 8356 publications and received 71368 citations during 2015 to 2019.
- The highest number of publications recorded in the year 2019. The maximum number of citation received IITM's publications in the year 2017.
- The 91.46% publication of IITM faculties during 2015 to 2019 published under categories such as Journals articles, Article in proceeding paper and reviews.

- The IITM faculties 30.48% publications published during 2015 to 2019 with collaboration with five institutes. The institutewise collocation of IITM found with first preference to Russian Academy of Sciences followed by second as IstitutoNazionale Di FisicaNucleare (INFN), Helmholtz Association of German Research Centres and Tata Institute Of Fundamental Research (TIFR).
- The 60.06% out of total publications from IITM published with international collaboration with USA followed by Germany, China, South Korea, Russia and Italy.
- The maximum 211 research articles published by IITM in Physical Review D followed by Journal of High Energy Physics, RSC Advances, Physical Review Letters, Physical Review B.
- IITM faculties published research in the various 15th forms of documents. The IITM faculties published majority of research in forms of Journals articles (91.46%), Article in proceeding paper (2.92%), reviews (2.24%), meeting abstracts (1.17%). The maximum number of citation also received to similar forms of document.

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Theme-2

Digital Library Applications and Services

Developing Digital Literacy Skills: A Future of LIS Professionals

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ABSTRACT: With the emergence of knowledge economy and the universal nature of information available in virtual and digital format leads the information professionals to equip with these forms and formats and literate themselves to adopt these new technological changes. The Traditional skills are no longer adequate for those who want to be effective professionals in the new electronic era. To provide effective services to their patrons, LIS professionals need to be competent in emerging areas such as library automation, database search and retrieval techniques, multimedia application, networking, design and development of library websites and digital library, and content development and management. There is need to enhance the literacy level of LIS professionals about digital resources they used. It is appropriate to intensify to what extent the LIS professionals possess sufficient knowledge of new digital technology which is essential for effective management of libraries. It's a need of the hour to find solutions to improve the quality of library services and the Digital Literacy skills of staff working in library and information Centers.

KEYWORDS: Digital Literacy, LIS Professionals, Digital Literacy Skills

1. Introduction

The ever growing digital information and its diverse sources on the web are producing new challenges for recognizing and accessing authentic information. Digital technology has changed the way we communicate, play and learn and opens a new ways and doors of using information virtually. Communicating and collaborating on content can be facilitated through variety of online platforms. With all this new opportunities, new requirements and responsibilities are arising for everybody. One needs to understand how to evaluate and look at the authenticity and validity of the information available. Literacy of digital devices and contents is the necessity of this new era of information. Constraints in acquiring the effective use of new information and communication technologies emerge the necessity of digital literacy and the skills to sustain in new digital era.

Digital Literacy is all about using technology confidently, creatively and critically to meet the demands and challenges of living, learning and working in a digital society, but its more than that, being a digitally literate person means having capability of communicating in all connected areas, can able to search, navigate and locate information in digital environment. It is basic skills that include effective use and reproduction of digital media, information processing and retrieval, active participation in social networks for creation and sharing of knowledge and exhaustive professional computing skills. After finding required information, it is necessary to apply the critical thinking skills to check the relevancy of information to our research needs. Digitally literate person can organize, manage and curate the required information in a systematic way that one can find the required information with ease. Another digital literacy skill is being able to create, construct and generate digital artifacts and digital identity like developing an online presentation, writing digital assignments, making a video about specific research area, etc. As a part of being a professional in a digital world also require the ability to communicate, connect and collaborate with others to share information or to be involved in group projects one need to do all the things using a variety of technologies and not just technology of today but with new things too with always adopting and changing. Being a flexible and capable in digital literacy is a great thing like key to success. Digital Literacy is the amalgamation of the two terms digital and literacy. Digital information is a systematic and symbolic representation of the data and facts and literacy refers to the ability to read for knowledge, write coherently and think critically.

2. Definitions

Paul Gilster who introduced the concept of digital literacy in his book Digital Literacy, defined that *"The ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers"* (Gilster, 1997). Cornell University defines Digital Literacy as 'the ability to find, evaluate, utilize, share and create content using information technologies and the internet'. Digital Literacy skills are those that enhance a user's ability to navigate, locate, read, organize, interpret, share, evaluate, and create texts, images, and sounds with digital tools in a digital environment (Kady and Vadeboncoeur, 2017). It is an extension of information literacy. It deals with electronic and digital information resources. It is necessary for the correct use of various digital platforms. It is also a person's ability to perform tasks effectively in a digital environment. Digitally literate humans are likely to be economically secure, as many jobs require a working knowledge of computers and internet to perform the basic tasks. Literacy

about digital resources includes knowledge, skills, andbehavior involving the effective useof digital devices such as smartphones, tablets, laptops and desktop PCs for purposes of effective use of digital information.

Qualities of Digitally Literate Person:

American Library Association in 2012 stated the following features of digitally literate person (Ganaie, 2013):

a) Possesses the variety of skills – technical and cognitive – required to find, understand, evaluate, create, and communicate digital information in a wide variety of formats;
b) Is able to use diverse technologies appropriately and effectively to retrieve information, interpret results, and judge the quality of that information;
c) Understands the relationship between technology, life-long learning, personal privacy, and stewardship of information;
d) Uses these skills and the appropriate technology to communicate and collaborate with peers, colleagues, family, and on occasion, the general public; and
e) Uses these skills to actively participate in civic society and contribute to a vibrant, informed, and engaged community.

Significance and Importance of Digital Literacy:

In the present technological era, enormous amount of information is generated in every discipline. To meet the growing challenges posed by the rapid production of information, libraries adopt digital innovation with the help of information and communication technologies to accelerate the process of information processing, organization, storage, retrieval and dissemination.

Over the past decade computer and other communication technologies have revolutionized human society. The digital revolution has given birth to digital libraries and electronic material with the increasing development in the World Wide Web results fast transforming library services and librarians roles. Libraries all over the world have been faced with the evolving technological advancement, globalization, and digitization of information. These have led to library automation, digital and virtual libraries. There are various types of information resources exist in different locations, modes, formats, channels in the form of e- resources like online journals, e-books, databases, organizational websites, Institutional

Repositories etc. in different subjects. Use of these technological information resources in the library and information centers is the need of the time, so it is must for LIS professionals to literate themselves and learn these digital advancements to be more equipped for resource sharing, social networking, surfing the net, instant messaging and blogging and host of others digital oriented activities to provide effective library services to the patrons. Digital literacy helpsLIS professionals to develop their skills that can improve their overall job performance and standard of living.

Indian Approach to Digital Literacy with Special Reference to LIS Profession

Application of Information and Communication Technology (ICT) in Library and information centers in India has shift the role of libraries from the storehouse's of books to knowledge base service oriented institutions mainly concerned with the effective access of information available in various formats.Academic Libraries associated with higher education in India are acquiring the benefits of the initiatives taken by University Grant Commission in the form of Information and Library Network (INFLIBNET).

Inflibnet

INFLIBNET is an autonomous inter-university centre initiated by University Grants Commission in March 1991.Inflibnet is the main advertiser of the application of digital revolution in India. It has launched many educational programs in India to promote digital contents. Some of the programs are INDCAT, UGC-INFONET, N-LIST, Shodhasindhu, Shodhganga, Shodhagangotri, Shodh Shuddhi, OJS, SOUL, etc.

Early initiatives are taken by Indian government to promote digital literacy and skills among LIS professionals with the programs like SWAYAM.

Swayam

Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) is the mission of Government of India under "Digital India" initiative to provide a wholesome platform and portal for online courses to achieve the principles of educational policy i.e. access, equity and quality. SWAYAM covers all higher education, high school education and skill sector courses. It is the product which is made in India for hosting the Massive Open Online Courses (MOOCs). The major objective of this platform is to provide finest teaching-learning resources to each and all.

Nine National coordinators have been appointed to produce and delivered the best quality content. They are:

1. AICTE (All India Council for Technical Education)
2. For self-paced and international courses
3. NPTEL (National Programme on Technology Enhanced Learning)
4. For Engineering
5. UGC (University Grants Commission)
6. For non-technical post-graduation education
7. CEC (Consortium for Educational Communication)
8. For under-graduate education
9. NCERT (National Council of Educational Research and Training)
10. For school education
11. NIOS (National Institute of Open Schooling)
12. For school education
13. IGNOU (Indira Gandhi National Open University)
14. For out-of-school students
15. IIMB (Indian Institute of Management, Bangalore)
16. For management studies
17. NITTTR (National Institute of Technical Teachers Training and Research)

For Teacher Training programme

SWAYAM by Numbers

Table 1: SWAYAM by numbers

Sr. No.	Particulars	Numbers
1.	Partnering Institutes	203
2.	Completed Courses	2748
3.	Student Enrollment	1,25,41,992
4.	Exam Registrations	9,15,538
5.	Successful Certification	6,54,664

The basic demand of the every profession is to get professional education with technological advancement and SWAYAM provides a great platform to professionals of Library and Information Science to learn digital technology through various

online courses from various national coordinators. So far various courses are taught on this online national platform and these are:

Table 2: Library and Information Science Courses on SWAYAM Platform

Sr. No.	Name of the Course
1.	Document Processing and Organization
2.	Information Sources and Library Services
3.	Database and Content Organization
4.	Library Automation and Digitization
5.	Information Storage and Retrieval
6.	Information and Communication Technology for Libraries
7.	Management of Libraries and Information Centres and knowledge Centres
8.	Information Sources System and Services
9.	Digital Library
10.	Knowledge Society
11.	Emerging Trends and Technologies in Library and Information Services

These are the initiative by the Indian government to educate LIS professionals to sustain in new digital era of digital information and to achieve the mission of creating India as knowledge based country. As a center of information and as a heart of any institution, Libraries or Library professionals must literate themselves with the new digital technology to cope up with the digital requirements of the stakeholders. Librarians can literate themselves by various digital literacy skills.

Skills of Digitaly Literate Lis Professionals:

Advancements in information services have gone far beyond in the last few years. The diversified changes are happen in information processing and servicing industry. The core role of information specialist is changing from information gatekeeper to information provider and these changes offer great opportunities for progressive librarianship to reach out far beyond the boundaries of their buildings and web portals, and to engage with an increasingly literate body of information customers.

Library and Information Science (LIS) Professionals can develop the variety of skills and qualities to come up with effective and efficient services to cater the needs of information seekers.They must educate themselves to adopt various

digital information skills to sustain in current digital world. Some of the skills are as follows:

1) Computing Skills (Hardware and Software)

a. Using digital devices

LIS professionals must use devices like laptop, desktop, tablet computers, mobile phones, storage devices like pen drive, flash drive, input devices like key board, scanners etc. to effectively facilitate the information needs of patrons.

b. Operating system software and application software

Systematic and operational operating of system and application software is a need of the hour. Librarians should also grasp these technological advancements to cope up with the demand of information. System software is used to provide a platform to smooth functioning of other software's. They include operating systems like Linux, macOS, Microsoft Windows, etc. Application software is a program specially designed for the end users. It includes educational software's like Encyclopedia, Dictionaries, word processing software's like MS Word, Notepad, Spreadsheet software's like MS Excel, Database software's like oracle, MS access, etc.

c. Downloading and installing educational software

Proper selection of required software is again a professional skill which requires knowledge of demanded information. Information catalyst must have computing skills like downloading and installing educational software's from the web.

2) Skills of creating online information

a. Creation of e-content

E-content means electronic content which includes audio-video, text, graphics, animation, images, etc. in electronic form. Information professionals can create their own e-content using above forms. They can create educational videos with quality audio and video output, can create attractive power point presentation for their teaching learning, they can use vi-

sual graphics and animation to show the collection and other library activities to their patrons.

b. Starting and managing an online discussion

Online discussions can enhance the attitude of learning and can serve as central learning hub for online learning community. Librarians must have the ability to start their own message threads or can leave their responses on other posts of online discussions. Thus they can openly swap their ideas and views to expand their knowledge and views.

c. Creating and writing a web page

A web page is a hypertext document connected to World Wide Web. Library educators can create their own web pages and facilitate end users of information by creating or collecting required information from a web. They can also comment their views on other web pages.

d. Creating own digital learning material

Digital learning materials are published in digital format. With the accurate and effective use of digital media, digital professionals can create their own learning material digitally like e-textbooks, e-workbooks, videos, e-tests,etc. is some of examples.

3) Skills of organizing online information

a. Creating website

LIS professionals can create their own library website using content management software's like Joomla, Drupal, wordpress, HubSpot, Sitecore, etc. where they can display and advertise the library activity, can provide easy and hassle free access to information which improves productivity with your own internet identity i.e. your website.

b. Creation of institutional digital repository

Information curators can create their own Institutional Digital Repository (IDR) to opens the wholesome outputs of the institutions in front of the worldwide audience. IDR facilitates the development of e-content with storing of digital teaching materials and provide access to digital material

with a location to support information seekers endeavours. DSpace, Fedora, EPrints, Greenstone, etc. are some of the IDR software's.

4) Skills in finding online information

a. Browsing databases

The major objective of the LIS professionals is to find the required information. The databases which are associated with library are more focused on scholarly books and articles. Librarians can use their professional skills to browse databases using various searching options like advanced search, federated search, Boolean operators (AND, OR, NOT), discovery service, etc. to find the accurate and appropriate information.

b. Evaluating useful online learning resources

LIS professionals can connect people and technology with information in context of research needs. Evaluation of online learning resources is the core part of information management. One must check the accuracy, objectivity, reliability and credibility of online learning resources.

c. Looking for online professional development opportunities

Many LIS courses are available on the platform like Swayam. Swayam is an initial IT platform made in India for hosting the Massive Open Online Courses. Library professionals can join these courses to stay themselves updated and to know the new trends in the profession.

5) Skills of communicating and sharing online information

a. Sharing through social media

Digital media is very rapid in nature and most commonly use in digital community. Librarians can share the created or collected information using these social platforms which includes Facebook, Twitter, WhatsApp, Linked in, Instagram, YouTube, Telegram, etc.

b. Sharing by email

Email is still one of the effective and most commonly used platform of document exchange on the internet in modern communication. Librarians must develop the ability to share document using email.

c. Audio-Video conferencing

One of the effective ways to communicate online is audio-video conferencing. Librarians can share the required information through these types of conferences.

d. Chat Rooms and forums

This is the place on the web where professionals can communicate and share their interests with others. A forum is a type of website that allows professionals to start a discussion, post questions or can contribute to various discussions.

Other Digital Literacy Initiatives in India:

1) National Digital Literacy Mission (NDLM)

NDLM is a mission of Indian government with a vision to literate at least one person from each house with crucial digital literacy skills. The target of the government is to educate more than 250 million individuals over the next few years. The main aim of the mission is to help the adults with low technological literacy and develop their skills to meet the needs of an increasingly digital world. NDLM is a platform of digital literacy awareness and education that will help rural communities to stand in global digital economy.

The various stakeholders for the Mission are:

a) Government of India, working to extend the vision of a digital India by promoting e-governance and transform India into a connected knowledge economy.

b) Corporate partners, who through their sustained efforts with NDLM have been harnessing collective energies to bring down the divisive digital wall.

c) Implementation partners, who are empowering communities with capacity building and training programs through digital means.

2) Code Unnati

'Unnati' is a Sanskrit word that means prosperity, empowerment or development and the initiative delivers on all three aspects. Code Unnati is a mission of digital literacy and IT skills development. It is an initiative aimed at promoting digital inclusion in India. It is launched in June 2017 with integration of the Digital Literacy curriculum within primary to higher secondary curriculum and imparts

skills in next-gen technologies among the 21st century youth allowing employment opportunities.

3. Conclusion

Library and information centers have become major medium for communicating knowledge available in varied forms and formats. Libraries are adopting the new changes emerge with information and communication technology. Application of ICT in Libraries has changed the working pattern of Library professionals. Librarians play a role of mediator between information and its users. They are the main information locators and play a very important role in exploring online web based resources available on internet. In view of these new roles of Library and Information professionals, it is assumed that the academic world of knowledge will achieve new heights and they will surely assist for the creation of the community of digitally literate scholars that definitely support India to achieve the goal of creating a complete knowledge base society.

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Rejuvenating Public Library Services through Digital Reference Sources

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Abstract: Public library services through digital reference sources for national development of India gradually rejuvenate. The paper highlighted printed formats of public libraries slowly moving towards paperless society i.e. how to accept digital reference sources/ services in the present scenario. This paper attempts to describe ten (10) public libraries emerging formats of digital reference sources and services including e-mail, web formats, online chat reference, video conferencing in urban areas throughout India. The paper recommended that adequate infrastructure, funding, proper trained personnel of public library enhance national development of India.

Keywords: Public library, digital reference sources/services, ICT, Internet.

1. Introduction

The dictionary meaning of Rejuvenating is make (someone or something) look or feel younger, freshers, or more lively. Rejuvenating public library mean public library sources of information gradually moving towards paper less society from traditional or conventional library sources to electronic, digital, virtual library sources. The concept of paper less society is originated by Frederic Wilfrid Lancaster in 1978. Modern public library also accepted Information Communication Technology (ICT), Computer, Internet and such kind of electronic gadgets and accessories, so that it provides all kinds of information and knowledge readily available to its patrons etc. Public libraries are used by general people to access information that influences their daily activities in education, health, religion, agriculture, economics, politics and employment. Public library assisted, supported and funded by the general people through local, regional or national government. The objective of libraries is to provide timely, accurate, authenticated and reliable information for its users'. public libraries offer services to the public free of cost and provide education, social, political, economic and such kinds of information to peoples not only traditional way i.e. printed format but also electronic and digital formats. Public libraries are trying to meet the needs of the patron by improving their services through enhancing their resources. Resources

is to ensure users' satisfaction through an efficient and effective information and reference sources.

Major contributions of public libraries to formal and informal education, including lifelong learning and various forms of literacy by providing information sources and services. Enhance citizen awareness and social values for the peoples by opening various windows to the world. As public libraries are people's university, the local gateway to information and knowledge, providing opportunities for independent decision making. Initial function of public libraries are good reading environment with fully air conditions, good lighting systems, current information resources and information communication technology tools to render services to its users. In this way public libraries play an indispensable role in the society.

2. Objectives

- To identify and explore how the public libraries introduced new services for effective use of their resources to the user communities.
- To know the library professionals attitudes and also help the professionals in updating their ability, knowledge, experience etc.
- To provide information about new concept,idea, outlook of new arrivals gadgets in their libraries and how to handle the new devices and give the exhausted pinpointed information to the end users.
- To study the prospects and problems in application of IT in public libraries.
- To find out the different advantageous factors (devices, gadgets,network and internet etc.) of using IT in libraries and become hybrid libraries.

Digital Reference Sources and Services

Digital reference sources and services started in the mid1980s, but it has developed rapidly in the first two decades of the 21st century. The terms digital reference sources, web-based reference sources, electronic reference sources and virtual reference sources are used with similar meaning interchangeably. Digital reference sources refer to a network/online environment. A question is received electronically and responded to electrically through online that time digital reference occurs. Digital reference sources are computer, Internet, ICT, web forms, CD, DVD, Pen drive, e-mail, chat, video conference etc. Digital reference sources are used both Synchronous i.e. real-time system and asynchronous i.e. e-mail, web-forms. Synchronous digital reference is characterized by two ways communication

between the question asker and answer er, using 'chat', 'instant messaging' or 'voice over IP'. Asynchronous digital reference source is characterized by communication in one direction at a time, by e-mail or web forms.

- E-mail: This technique is used for online information supply.
- Web Forms: Ask A Librarian is a web – based reference service users are asking their specific questions and library will send user's answer within two working days.
- Text -based Chat: Through special text based software librarians and users can chat or instant sent message, user's satisfaction is the main motto to provide the information.
- Video-conferencing: Librarians, library professional and users can see each other while both are conducting a face to face interview through video conferencing.

Conventional reference sources and services accomplished face-to face or by telephone or fax within the library. When the library is closed, users can not get services but with digital reference sources users can access reference sources despite time and distance. There is no doubt that digital reference sources provide more alternative and flexibility to users within a digital or virtual learning environment as required at any time, any where any place.

Scope

Public libraries have shifted due to intervention of new technologies over the past two decades. Due to information explosion and information overload, the emergence of the information technology has drastically change public libraries to provide web-based information and digital reference services to their users. Now a day, public libraries are developing their own websites. They have shifted from printed materials to providing access to information via the web in the covid pandamic situation. User can access e-books,e-journals, magazine, newspapers etc by using their ID password or login to their account in to the particular library from any time any where.

Ten (10) public libraries have been adopted in my present study . They have their own websites as follows:

Depicted in Table 1

No	Public Libraries	Websites/Library URLs
1	Delhi Public Library(DPL)	http://www.dpl.gov.in
2.	Saraswathi Mahal Library (SML)	http://www.sarasvatimahallibrary.tn.nic.in
3.	Connemara Public Library(CPL)	http://www.connemarapubliclibrary
4.	Allahabad Public Library (APL,	http://www.allahabadpublic.org
5.	Allahabad)	http://www.publiclibraries.ap.nic.in
6.	State Central Library, Hyderabad	http://www.statelibrary.kertara.gov.in
7.	(SCL, Hyderabad)	http://www.annacentenarylibrary.org
8.	State Central Library, Kerala (SCL,	http://www.amirplibrary.org
9.	Kerala)	http://www.ernakulampubliclibrary.com
10.	Anna Centenary Library (ACL)	http://www.maharajapubliclibrary.org
	Amir-ud-daula public Library (APL, Lucknow)	
	Ernakulam Public Library(EPL)	
	Maharaja Harendra Kishore Public Library(MHKPL)	

Library Web pages generally provide access to the digital sources/services.

Methodology

Sample size is ten (10) public libraries all over the India. Simple random sampling technique will be adopted for the study. Users can ask for web-based reference sources from a remote location at any time of the day. 80% of all usage occurred between 8 a.m. to 10 p.m. The busiest hour was between 2 p.m. to 3 p.m. Digital reference sources is a new powerful tools and technique of providing a reference services. Digital reference sources have vast increased and developed in the year 2001 called springing time but in 2002 saw cool autumn because many negative voices and huge debate on professional's discussion were raise.

Public libraries are increasingly providing access to information through Internet, ICT and Computers for users. 91% of libraries offer free internet, 76% of e-books for borrowing and lending, 90% offers formal or informal technology training to their patrons due to covid pandamic and public libraries of India also gradually moving towards digitization in the present scenario as user are not physically visited any library**.** In this way we can also improve digitization of public libraries of rural areas. The main issue is how to fit digital reference source into ongoing activities of public libraries. Whatever we do, the main objective of the service is to make users satisfaction. Multiple forms of reference sources/services allow easy access to users with varying personalities, knowledge levels, skills and economic conditions.

Table 2 Summarizes the services available online for the libraries of study.
Digital/Electronic Library Services Provided by Public Libraries

Library	General Digital/Remote Enquiry Services	Catalog on Web	Dedicated Web Site	FAQs Page	Interactive Services	Resources Remotely Available	Links to Other OPACs
DPL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SML	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CPL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
APL-Allahabad	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SCL-Hyderabad	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SCL-Kerala	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ACL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
APL-Lucknow	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EPL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MHKPL	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Findings

- Users received their require information during the covid pandamic through digital reference resources using ICT, internet,network, computer, electronic gadgets etc in public library.
- Public library can reduce high rate of illiteracy and other forms of social ills that are associated with better condition in the society.
- Public libraries are needed for socio - economic growth and development of our country.
- It assists, helps and supports the citizen to access information in various fields and in different forms and formats of human efforts.
- India needs to rejuvenate its public libraries to betterment of the citizens and to improve information manipulation, retrieve and dissemination which would generate growth and development in all the sectors of the society in general.
- Digital reference sources and services delivery quickly and easily answered to patrons than any other formats. So digital reference sources and services could be a time saver for patrons.

3. Conclusion

A literate society is an informed society. Public libraries are vital institution in any society.In the 21st century Public libraries are well equipped with modern facilities such as computer, network, ICT,internet, web etc predominantly located in the urban areas across the country. Digital reference is a new powerful technique of providing reference services. Digital reference services could be a time sever for users and using ICT, internet is more cheaper than using telephone,fax etc. Clerical, technical,administrative and professional staff of public libraries are need to support and promote the digital reference service. Digital reference services give an extra choice for users although it does not take the overall workload of the library. In the covid situation public library play a crucial role to generate, manipulate, retrieving and disseminating information in the digital form and users get their required information from their home any time.

Recommendations

- Most of the public libraries are inadequate infrastructure, lack of fund and lack of manpower due to covid pandamic situation . So, government should take steps at all levels to allocate sufficient fund annually to improve public libraries. As a result, public libraries will have modern infrastructures and equipment's which would facility and encourage users.
- To monitor and maintain public libraries activities a committee should be set up by government to ensure public libraries play their role effectively in the society.
- Librarians in the public libraries should be sent for high quality training, retraining to ensure adequate service provide to the users.

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Digital Preservation In Libraries: The Benefits and Challenges

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Abstract: The research of future depends upon the research studies of the past and which can be done with reliable digital preservation of the present thought content for future use. For the promise of providing long-term access, digital preservation is the most effective way. But the libraries seeking for long-term preservation face a lot of challenges. This paper is focused on different aspects of digital preservation, the strategies to be followed, the changing role of librarians in context to digital environment along with the potential challenges for digital preservation which the libraries are facing irrespective of their type or size of collection. The benefits that the libraries are getting through digital preservation are also highlighted.

Keywords: Digitization, Digital Preservation, Digital information, Digital archaeology, Metadata

1. Introduction

The term digital preservation is practising from the time being the born-digital records were created but in the last two decades with the most implication of information and communication technology, the digital preservation becomes a part of the plan of many libraries. Before going for digitization, the libraries must be aware about the essential requirements including fund, staffing, infrastructure, space, storage, media, way for dissemination of digitized information etc. The digital preservation of a library may include text, image, audio, video or graphics. Digital information is fragile and may face the threat of technological obsolescence (Li &Banach, 2011). Every bit of digital information stored is now facing great challenges for best preservation and efficient access in future. Digital preservation can be defined as the policy, strategy or action for rendering the authentic digital content irrespective of the challenge of deterioration of digital media and technological change (Noonan, 2014). This paper presents the different aspects of digital preservation along with strategies, challenges and benefits.

Literature Review

According to Harrod's Librarian Glossary " Digital Preservation is the method of keeping digital material alive so that they remain usable as technological advances render original hardware and software specification obsolete."

The increasing demand of the users for round o'clock service makes the librarians offer digitized service (Guenther ,2000). The range of service extends in the modern libraries such as effective study space, licensed digitized material, management of digital repositories etc. creates an efficient librarian (Campbell, 2006). Wawrzaszek (2008) pointed out that the libraries must be come into force for making a changeover of their traditional journey in the digital environment. Libraries are now drastically changing through the adoption of new technology in various forms of their activities by a paradigm shift of focus from physical to digital formats (Choi & Rasmussen, 2009). By applying new technologies, the library services for creation, dissemination and preservation of the digital material goes in a cyclic way (IFLA,2010). If there are no pre-existing digital preservation systems that could be used as templates, outsourcing advantage can be taken as of the vendor's experience in managing large sets of data and load balancing (Oliver,2015). Convergence can provide an opportunity to the 21st century libraries for their inter connection in the purpose of sharing and preserving knowledge and cultural heritage. Regarding the convergence strategies copying and quality assurance are highlighted by (Brown,2016). Though more than 70% of the AIR media libraries are preserving their digital collections but there is a requirement of proper planning, policies and have to find out new tools and techniques for the enhancement of library services (Sarojadevi, K,2016). The policy development is the foremost step for preservation activities and which can ensure for the long-term preservation actions (Adjei ,2019).For better preservation it needs to concentrate on funding, staffing, management support, getting external expertise in preservation activities and let the staffs involved in digital preservation work to attend conferences or workshops held on the digitization and digital preservation (Masenya,2019).

Aspects of Digital Preservation

The aim of preservation is for allowing users to view and retrieve data in a valid way in future (Rotenberg, 2000). Though the requirement for digital preservation varies from institution to institution but this can be based on certain aspects as follows:

Accessibility: This is most important in digital preservation that the materials digitized could be accessible in future which is basically depends upon the lifespan of the storage media and programming of the software used for preservation. With the suitable preservation strategy, the information can be stored and migrated for safe future use.

Comprehensibility: The preserved information needs to be understood by the future generation. This will be possible if the materials at the time of digital

preservation is not codified. The data should be digitally processed as it is in original form.

Authenticity: The authenticity of the data selected for digitization should be checked. Authenticity is true to one or trustworthiness. This builds the ability for identification and validation of authorship and origin of the digital object. The electronic seal or signature could be used as provenance.

Integrity: This denotes that the preserved material must not be tampered or falsified. The digitized document should convey the real intellectual content of the source document. The integrity of data makes able the readers to trust the accuracy and authenticity of the digital sources with preserved evidences.

Digital Preservation Strategies

The main aim of libraries is to build a sound collection of various data type and further making them enable to be accessed by the users. The information in digital media has limited life cycles as comparison to print media and the key issue is to keep preserved the digital information in readable form for the future generation. Hence various techniques can be used to preserve the digital information which are discussed below.

Refreshing: In this technique data is transferred from old storage media to new storage media. The bit-stream is not changed at the time of copying. As the issue related to weakening or obsolescence of any preservation media is resolved with this technique, this is the most used preservation strategy in the libraries.

Technology preservation: Technology preservation is the preservation and maintenance of the technical environment i.e. the operating system, original application software and media drives. It is also called as the disaster recovery strategy for the digital objects which have not undergone with proper digital preservation strategies. Though it can extend the access for obsolete media but for management of this strategy requires considerable investment and human resource.

Digital archaeology: This strategy is used as an emergency recovery strategy which is used to recover the content from the storage media which is unreadable because of damaged physically or hardware failure. With this technology data on very old magnetic media may not be recovered.

Migration: Like refreshing strategy migration technology covers the task of periodic transfer of digital materials from one configuration to another. The main purpose of migration is to preserve the digital objects as it is and make it retrievable by the future generation. Though the creation of replica of the digital

objects is not always possible but creates the compatibility of the object with changing technology. Digital objects are constantly migrated to new computing devices and storage media for making data accessible.

Emulation: For emulation, a special software emulator is used for the execution of instructions in new platforms. In this technology, the software and hardware are combined to reproduce all required characteristics which can be operated in a new environment. As it is technically complex and cost intensive, it is difficult for single libraries to manipulate and can be possible through consortia.

Challenges for Digital Preservation

Due to frequent change of technology to preserve data digitally becomes challenging for the librarians and archivists. The challenges for digital conversion and digital preservation of resources can be put in two groups, such as technical and administrative.

Technical challenges

i. **Storage media may have short life:** For the purpose of safe keeping of data storage media is built but all storage media are destructive. The manufacture companies prepare magnetic tapes or optical storage disks with a short-term storage capacity which can not be used for long-term storage in libraries. Many factors like rough handling, inconsistent temperature, poor connection of low-quality hardware have a direct impact on the longevity of the storage media.
ii. **Obsolescence of technology:** The hardware, software and file formats are affected by the technological obsolescence. Basically, the software with the new version are generated so fast that the data stored on older media may not be readable by the new software. The technology used to read and interpret the contents stored in a media is changing faster than the obsolete of media itself.
iii. **Machine Dependency:** Unlike analog information, digital information is machine dependable. To read the digitally preserved data, suitable hardware and software will make it understandable neither the contents could not be accessed if there is no supportive specific hardware and software.
iv. **Fragility of storage media:** As the computer technology is changing very

fast, the current or future computers may not be able to process the data on older media, the drives having connectivity with the older media may not recognize or show connectivity. There may not be the software, which can read the older files preserved in any storage media.

v. **Persistent archive management:** The digitized contents not only need preservation but also needs careful description with the assignment of administrative, descriptive and structural metadata. A consistency in management of digital records with the information integrity has to be maintained and a trusted digital repository has to be created by the libraries to store large collection of digital contents and make the information accessible.

Administrative Challenges

i. **Lack of preservation policies:** Because of lack of definite policy, the goal of digital preservation in libraries sometimes could not be achieved. As a predefined policy helps in identifying materials for digitization, defines the means of access to the digitized content, helps in creation of metadata and also confirms for long-term preservation, libraries need to ensure for the formulation of a best digitization policy.

ii. **Insufficiency of skilled manpower:** Still many librarians are not aware about the digitization technology or have a negative experience with this. It doesn't help that "digital preservation is an extremely complex, evolving field that requires a great deal of knowledge to understand" (Duff, et.al., 2006). The libraries may not have adequate knowledge on digital technology. Also, special training for the librarians is needed for selection of documents for digitization, organization and dissemination of the digitized document as not everything needs to be preserved.

iii. **Digital conversion is expensive:** For digitization and digital preservation libraries need extra cost for digitization equipment, to hire skilled manpower, to purchase repository software, regular maintenance, cost for technology for media reformatting. Hence support from management authority must have to be gained by the libraries for the extended budget.

iv. **Intellectual property rights issue:** Intellectual property rights issues greatly effect the selection of documents for digital preservation and maintenance of the digitized documents. Sometimes it becomes hard for the librarians to get permission from the copyright owner of the document before digitization and also in the post digitization period to review the access restrictions.

The Future of Digital Preservation

Although there is considerable caution with regard to the ability to manage the digital contents and provide access facility as on a long-term basis, but is hindered because of unavailability of fund, manpower or effective tools. There are many issues associated with long-term preservation which needs to be set on. Therefore, the libraries need to be prepared for the constant technological change (Arthur, 2004). By implementation of the following points digital preservation in future could be well managed:

- The society, the same type of libraries and the management must have to provide support and understand the challenges for digital preservation in libraries.
- The challenges with respect to long-term preservation of digital objects and access must be explored with strategic planning and necessary funding.
- The digital preservation and access to the digitized content should be considered correlatedly.
- Not only the librarians but also all the professionals involved in digital preservation should work in a collaborative way to overcome the issues related to digital preservation.

Benefits of Digital Preservation

Now the libraries are applying all their efforts for effective and quick rendering of service to the user groups. Digital preservation plays a vital role in making this dream successful. The traditional libraries were restricted by the storage space, but the libraries with digital documents have no physical space constraint and the round o'clock accessibility facility uplifts the importance of libraries. The benefits

after digital preservation of documents in the libraries could be outlined as:

- **The originality of the document will be maintained:** The documents digitized by the libraries and digitally preserved have a persistency of their originality as they are not modified or tampered in any way. So, the original creation of the author could be preserved to be accessed by the upcoming generation.
- **Easy for data update:** The master files after digitization is stored in a hard drive or a server can be checked on a regular interval for its accessibility and by the application of long-term preservation strategy the data can be migrated to other storage devices easily for safe future use.
- **Making documents usable for a longer period of time:** Digital preservation is the only mechanism to preserve and make accessible the old, fragile and rare documents. The documents with very bad physical condition in analog form could not get access permission, hence after a technical processing by the digitization team they became readable and digitally stored for long-term access.
- **Easy information retrieval:** In all digital library software information search and retrieval is an important feature. The powerful retrieval engine and flexible user interface supports for fast access and reach at the exact searched data. The effectiveness of the result depends upon the appropriate metadata and suitable indexing.
- **Get opportunity to collaborate with different digital libraries:** Similar documents in digital form can be utilized by all the participating libraries. This resource sharing saves the time, energy and fund of many libraries. This may not be the situation for the documents which are copyright protected but the rare and documents of cultural importance could be given importance.
- Changing role of librarians
- For the management of digital information and extended service towards

the users in the digital libraries, there is need of skilled library professionals with a sound knowledge on Information and Communication Technology. Cox & Corrall (2013) describes the modern librarians as repository managers or knowledge managers. Librarians play a great role in identifying the right information for digitization, to acquire efficiently the born digital information and disseminate that by creating knowledge warehouse in a networking environment. For developing, organising, and managing the digital resources in a systematic way, librarians play an active role as:

- **Develops the digital collection:** Librarians have to take decision in concern to the selection of material for digitization keeping an eye on the scope, objectives and target audience of the institution. For born digital resources, they should evaluate the requirement and check availability of necessary facilities for their suitable dissemination.
- **Acts as a content manager:** The digitized resource or acquired digital resource will best be utilized by the users only when the content is well organised in the library web page or in the specified portals. The metadata created for each digital resource means a lot for easy data searching by the users. Librarians must have to gain knowledge on creation of different types of metadata with basic knowledge on web page management.
- **Coordinates training programme:** For the success of any digitization project, two things puts value i.e. how it is developed and how it is utilized. For the first part, for the development of a digital library, the foremost need is skilled manpower for which the librarian either can hire from outside or can make his own staff as skilled personnel by conducting workshops and training programmes. The second part is for users who should be well aware about the available digital resources and how to reach at their required document. The librarian has to organize user awareness or demonstration programmes for the best utilization of the digital resources.
- **Steps towards resource sharing:** To fulfil the demand of the research scholars the own house digital resources may not be enough, hence by joining consortia or sharing resources with other same libraries, librarians can

enhance the SDI activities in their libraries. Though there is fear of loosing autonomy but the challenge of insufficient staff, resource and fund can be overthrown.

2. Conclusion

With all rapid changes in different fields, digital preservation in libraries has also undergone with the same fluid in the present time. Now digital preservation is considered as an essential activity in many libraries. Not only the librarians but also the authority of the parent institutions have recognized the need for digital preservation and trying to commence the digitization programs. There are now many national initiatives for digitization have risen in different countries. These initiatives will definitely help in following a best digital preservation strategy. The role of librarians and information archivists are most vital in testing and implementing different methods for long-term digital preservation. They have to be equipped with the necessary skills to handle digital resource management and preservation. The libraries have to follow different digital preservation strategies and policies keeping in view of the nature of collection, the utility factor and available fund in order to overcome the challenges coming in the way of digitization projects.

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Digitization and Automation of School Libraries :Issues and Challenges

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ABSTRACT: As we see computers are being used in every field of human activity as its number of physical properties. Computers have been in use from last many years into library and providing best possible information services to the library users.. Automated libraries have taken shape in the society. This paper will help us to know various library processes that have been automated, to identify the school libraries schools that have automated, to determine challenges faced by schools in automating the libraries, to determine what policy makers can do about school library automation in Delhi.

KEYWORDS: Library Automation, Serial Control, Internet, Intranet, Opac

1. Introduction

The library is considered part and parcel of the academic set-up in any school. Manyeducational institutions create the library primarily for it to serve as a supporting facilityfor educational activities. As the information technology revolution sweeps across everysector of the society, the library and information field is not sparred. Schools arerecognizing the importance of having computers in the library and automating theirprocesses. The results realised from automating are of great importance to schools asthere is efficiency and cost-reduction in terms of Library processes.

Now in these day's we have just entered in new millennium or new technological era. The ICT make lots of changes in every field also in Library information Services. In recent decades we have witnessed the establishment of automation industries and library information networks and services around the world through use of ICT. The use of Information Technology tools facilitates a vast flow of information to end user via information services.

Reasons for automating as given by Addullah (2002) ranges from need for school and libraryefficiency, curriculum support, information access, information skills instruction, publicrelations and facilitating collaboration. The other significant reasons especially for usersof the systems include improved cataloguing and

circulation of resources, availability ofreports while educational benefits for students would include greater access ofresources.

ICT makes several changes in the area of library information services such as book acquisition, cataloguing Serial-control, Web-Opac (Online Public Access Catalogue), CAS and SDI etc. And change the traditional library into the e-library or information centre. Library information Officers saves budget, time, manpower in routine jobs and able to provide effective library information services without any geographical limitation.

The users of the library are from different areas such as producers, policy makers & experts, judges, observers, professors, teachers and students, as well as educated workers and farmers etc. The main purpose of the library is to provide "information" to all of these according to their needs. After re-updating the information, alloingaccess to this information to their respective users is the main purpose of libraries. But the students who are actually our future, who are the developers of the new society, new grounds of technology, and therefore they are most priotorised ones who must be served with this facility of automated library.

The late period of the twentieth century has been the peak period of the development and communication of knowledge related to science. Since 1965 its growth rate has increased from 5% to 7% per annum. Communication techniques are playing an important role in spreading knowledge. The modern instrument of communication presented by the web; and internet has introduced a special energy and velocity in the world of knowledge. Now we have to anticipate the future libraries of 21st Century and need to develop them accordingly.

Information technology is a mode used to convey or disseminate information and use innovative research in technology. Today, this information technology has absorbed all sectors from its activities. Computers are contributing in almost all the works. But information technology has given its attention to its work. Information technology is being used in the library for the spread of knowledge science.

Importance of Research Presented.

Every day, the science is leaving its effects in different areas of the society. Science has left its impact so far that we cannot complete any activities of life without the help from any of these informatics techniques and devices. In the era of this scientific revolution, we have gradually been using information technology in all areas. In other words, the whole world has become a global village. Within a few seconds, we can broadcast any kind of information, through information technology, everywhere. Most of the use of information technology is currently

being used to disseminate information along with the industrial areas. While the whole world is moving towards this technical edge the students who are perceived to be our future are the ones who must be made habituate with these technology and techniques. And particularly library automation could be the one from where a student can take the maximum advantage of learning.

Understanding Automation

The term automation is used in automatic manufacturing, control system, computing machinery or equipment that reduces the participation of human labour in production or services" – New Encyclopedia Britannica

"Any work which has been done with help of automatic machine like computer without any human interface is called automation. The biggest benefit of automation is that it saves labor, however, it is also used to save energy and materials and to improve quality, accuracy and precision".

On the basis of the definitions of automation the following may be considered to be its essential characteristics:-

- The operations of processes are carried out automatically
- Avoids or reduces human actions and thus save labour
- Increases accuracy and quality of work
- Increases efficiency and spped- up the operations

Library Automation:

The Phenomena of mechanization of traditional library activities, such as acquisition, serial control, cataloguing, circulation control etc., was called library automation.

"Library automation refers to use of computers, associated peripheral media such as magnetic tapes, disks, optical media etc. and utilization of computer based products and services in the performance of all type of library functions and operation. Computers are capable of introducing a great degree of automation in operation, function since they are electronic, programmable and are control over the processes being performed".

Library automation is the general term for Information communication technologies that are used to replace manual system in the library.

Importance of Proposed Investigation:

Traditionally school libraries have been catering to the document needs of their users These libraries also provide their library and information services to the

students by allowing them to have access and use of books, journals, magazines, maps and atlases, reference books, audio and visual documents, and other such printed and non-printed documents. Libraries have to provide their valuable library and information services to the large community of students as it comes under their duty of social and professional obligations.

Since now a days, computers are being used in every field of human activitybecause of its speed, accuracy and capability of large scaleprocessing.Computers have literally invaded and entered into library andinformation services for the effective use and for the benefit ofthe library users.It is perfect space saving device as well because information storedon computer readable devices takes much less space than theconventionally stored systems. Libraries and information centres have devised libraryautomation efforts and practices in order to provide their betterlibrary and information services to the right users in right time atthe earliest.

The following are the areas where computer are being used at present.

1. Online public access catalogue

- Online Public Access Catalogue (OPACs) the problem being faced by the users in locating the document was the first to be targeted in the library automation. As a result the work first started in this direction. There was one more reason for this and that was the availability of CDS/ ISIS software which had the facility of catalogue only. It was in contrast of the special libraries where the work first started on providing information services like CD-ROM search. Even today this area of automation has more activity than any other area. It has now graduated to Web-OPAC (web based online public access catalogues) where university libraries have made their databases available on their websites. This has eliminated the need of installation of search software on the user's terminal. One potential which remains unutilized is the use of search data for research purpose as the search history can provide very useful tools for the librarians to formulate their collection development plans.

2. Circulation

- Circulation Circulation is one of the main activities of a university library or any library per say. In university libraries, however, the number of books issued and retuned are more than in special libraries. Therefore, the next area which was taken up was the circulation. In some of the libraries the

number of books issued/returned may be more than one thousand per day. We at IIT Roorkee (formerly University of Roorkee) has experience of issuing 1500 books in six working hours. Sometimes there used to be a queue of more than 100 students, since the free hours for all students used to be the same, before automated circulation started. Use of barcodes had made the life very simple due to added accuracy and speed. Besides speeding up the issue/return, printing reports, sending reminders also become very easy. Circulation data also provides a very important insight into the book use pattern. Librarians should try to use this data for research and development purpose.

3. Acquisition

- Acquisition- Use of computers in acquisition remains a low priority area. Not many libraries are using computers in acquisition. On reason may be the continuously reducing budget for purchase of books. But this area needs to be strengthened. Computerization at the stage can help not only in order processing but also can be a very effective tool in budget control. You can allocate funds to different departments based on a set formula, can send department heads about non availability of funds, can control over ordering and also utilize the data entered at this stage for technical processing and OPAC.

4. Serial control

- Serial Control Idiosyncracies involved in serial control affects the use of computers in serial control and hence the area is not very well represented at automation scenario. One more reason is the unsuitability of serial control modules available in most of the library Management Softwares. The procedures developed by these softwares are so cumbersome that sometimes it looks easier to use normal method rather than automation. However, this area provides very good stage for use of computers as it can help tracking the missing issues very efficiently and provide the current awareness services and even the SDI services besides budget control.

5. Intranet

- Making the information available on intranet is also growing popularity

as it eliminates the need of installing the software on the users' terminals. Users can access the catalogue through intranet or they can find the status of the books issued to them through web access. CD-ROM resources and other digital resources can be accessed on intranet. The beauty is that one need not be conversant with the software as the web links are available through the web page. Growing installation of campus wide networks is also playing a positive role in this direction.

6. Internet

- Internet Use of Internet for academic purposes is also increasing day by day. More and more libraries are putting their resources on Internet. Internet is the medium both to access and disseminate information. Internet has emerged as a very big virtual library which has information on practically every subject and in every media may it be text, audio or video. Libraries should use this facility to the best of their capability. They should provide links to similar type of libraries through web pages. One very good use can be designing of e-gates where user can have access to the electronic resources through a common user interface. I would like to mention that a number of free e-journals are available on the Internet. The prominent among library and Information Science are 'D-Lib Magazine', Issues in science and Technology Libraries", "Cybermetrics" etc.

7. CD-ROM services

- Digital Libraries: Digital library has recently become the buzzword for librarians. In the last year most of the seminars and the conferences had 'digital libraries' as their theme. Digital libraries can be of two types i.e. digital libraries of the digital text available in the market such as e-journals, CD-ROM databases, e-books, software etc. or it can be developed from the printed text available in the library. If a library takes a decision to develop a digital library of its collection specially theses, dissertations and old journals, it can solve the problem of space and preservation both. But the decision about creating such decision is taken to be very carefully as it will prove a very costly venture both in terms of money and manpower.

Prospects: Futute of Library Automation

Having talked about the problems and areas of applications let us talk about future prospects. I can definitely say that the things are changing for the good. Now school authorities are realizing that there is no way to escape library automation. They are finding various ways to finance their library automation projects. Librarians are also realizing that they can not remain indifferent to the change, otherwise they will be labeled outdated. One area of concern is the library science graduates being produced by our library schools It is surprising that UGC is giving responsibility of refresher courses of library science to the library science school and not to the libraries who are established themselves as advanced libraries and uses the technology far ahead than the library science schools. Existing staff is getting rid of the fear of computerization. They are coming forward to learn and make themselves suitable to face the challenges of the new millennium. Standardization is increasing and the better softwares are available.

Review of Literature

BEHRA (J K) & SING(S P). Problem & Challenges of Collection Development of Indian Libraries in Digital Era -An Assignment .Journal of Arts, Science & Commerce .V2(1).Jan,2011 Singh has written in his present article that the advancement of knowledge in the human civilization led to the emergence of the library. Due to the increase in daily library collection, one time physical stocking becomes difficult due to this problem. The library has started.

BERGMAN (H).The Library and its User as Examplified by Vienna University Biblos V 34(4), 2002. In his report, Vienna University conducted a survey related to their library usage among 500 teaching staff. The literature related information was included in it. The facilities provided by the School Library, User Training, SchoolLibrary opening hours, critical studies about services and the need for improvement etc. have been taken into account.

CHOI(Y)and RASMUSSEN(E).What is Needed to Educate Future Digital Librarian: A study of Current Practice & Staffing Pattern in Academic & Research Libraries.D-lib.V12(9),sep,2006 In view of the current changes in the library, in the article, what is the quality and education in the library should be evaluated in the future.

DAS (A K) and DATTA(C D). Information Retrieval Features in India Digital Libraries: A critical Appraisal Vol23(1),2007. Das, Datta and Sen have tried to explain the current nature of digital library, various aspects of digital library and requirements in their joint articles.

DEOGHURIA(S)Are research Libraries in India Prepared in Digital Age? LIS conference,2010. In this article, they told that digital information is continuously growing as a component. Research has a significant impact on research libraries. The collection of research by digital libraries in digital form is increasing day by day

But how much adaptation of research libraries in India and how much adaptation of this new technology has been introduced, it has been presented in this article. At the same time, detailed explanation of what difficulties are being faced by the research libraries in India

JONES&THOM: Mobility, Digital Libraries & a Rural Indian Village.JCDL.2009. Jones, according to one of his surveys, found that in the developed countries, lots of people use information technology in daily activities. Therefore, they have prepared a blueprint for Information Technology-based libraries for the promotion of education. In this article, on 3 mobile platforms, they have been explained.

SAMANTARAY (M).Preservation & Management of Digital Resourses Polices, Issues & Challenges INFLIBNET Planner. 2006. Analyzing the long term strategies and techniques for their preservation, while explaining the difficulties in the maintenance of digital tools and their systemization in their articles.

Ahmad (2009) studied on Library Automation of Al-Barkaat Institute of Management Studies, Aligarh with the help of Alice for Window (AFW) LibrarySoftware. The study found that ABIMS Library was the first fully automatedlibrary among all self financing Institutes available in Aligarh, which hasprovided, Online services to its users through Inter Library LAN System in whichusers can access the library database from the Online Public Access (OPAC) andalso help to library staff to provide good reference service to staff and students.

The concept of automation has changed the scenario of librarymanagement. In this regard, discussing library automation, its problems andprospects Bhanja and Barik (2009) highlighted in a study that success of libraryautomation mostly depend upon nature of softwares used for the purpose andemphasis on selection of good library software for automation.

Ibohal Singh and Giridhari Singh (2009) in a study discussed thelibrary automation in public library system in North East India. Based on thefindings of a sponsored research project, the study highlighted Public LibrarySystem, ICT, Scope and Methodology adopted and emphasized backgroundinformation, services, existence of library committee and automation status of thelibraries in the region.

The status of Automation of the Central Library, IIT Guwahati has beenassessed by Sarma and Jyotirekha (2009). The study discussed the status ofautomation and networking, hardwares used in the library, services and facilitiesprovided. The same has shown that the library was fully automated using Libsys software package. The study also revealed that IIT Guwahati Library providesexcellent service to its user and it could be considered as one of the best librariesin North East India.

In carrying out a pilot survey in ten special libraries in Manipur assessingtheir automation status, Vaiphei and Bembem (2009) analysed the problems andprospects of automation in Manipur. The study revealed that most of the speciallibraries in Manipur are not automated due to various problems like lack ofseparate building, untrained staff, no qualified librarian and paucity of funds forlibrary, etc.

Information has been regarded as a national resource which affects allhuman activities. Information is power and indispensable. In this context,Bhuyan (2011) in a study discussed about the automation and networking ofpublic libraries in India with special reference to two districts of Assam. Thestudy shown that due to financial inadequacy, lack of proper administrativestructure within the library, lack of professionally trained staff and nonavailability of mechanical devices, the public libraries are limiting themselves tothe traditional and pedestrian functions of the library.

In assessing the present status of automation of public libraries in Assam,Das (2011) found that infrastructure and the service of the public libraries inAssam are not modernized but somehow traditional services are provided tocommunity and public library automation is in its initial stage though its processhave been started during 2004-2005.

Jayaprakash and Balasubramani (2011) in their study have emphasized that automation of library operations and services are essential for efficientfunctioning of the library and saving the library user's time. In this purview, thestudy has investigated the Automation in University libraries in Tamil Nadu. Itdiscussed automation, its need and application in university Libraries. The studyexplained the various problems faced by authorities and the staff during theprocess of automation. The tool adopted to conduct the study was a wellstructured questionnaire.

Joshi and Nikose (2011) discussing problems and prospects inautomation and networking in libraries in India, highlighted some of the scientificand technical libraries working and leading in library automation under suchR&D institutions

like CSIR, ICMR, ICAR AND DRDO. The study alsodescribed networking as the linkage of working procedures for the exchange ofinformation resources and revealed some of the barriers of networking as highereducation authorities still have a dilemma as to whether or not resource sharing ispossible through networking. Potentialities of INFLIBNET, as the study shows,are still not known to many academic libraries and UGC fails to provideappropriate funds to academic libraries for computer software and hardware.

A study was carried out to assess the automation status of district libraryKamrup by Medhi and Deka (2011) which has revealed that the library does notuse computer for automation of the library services. The study also found that thelibrary was still giving traditional based services to the users.

Akinyi R, Mulaha in "The evolvement of school library resource centers inKenya" aimed to help the Kenyan educational authorities and others to understand thevalue of a school library resource center in the educational process and in the schoolprogram.

"School library provision in Nigeria: case studies ofsix secondary schools in Oyo, Ondo, and Ogun states" by Olabisikolapo was a summary of findings on school libraries into the development of formal education in Nigeria and the relative neglect of school library provision. The author attempted to establish the factors responsible for the generally poor standard ofschool library provision and suggested what might be done to improve the status.

Omrin and Olayinka (2007) in a study seek to find out the advent of computer on libraries and information centers. Majority of the public libraries in Nigeria are found to perform their operations manually and have no requisite technologies to easily access information resources and services most especially on the internet, on-line data bases and CD ROM databases and lack of skilled staff in computerization was also observed. Computerization has a lot of impact on library and information centers since it helps them perform better than when their operations are manually carried out.

Imchen (2009) in his study, discussed computer application in libraries of Nagaland and also made an attempt of bringing awareness among the librarian the importance of computer application in libraries in the state. Personalinterview and random sampling technique, and observation method have been used successfully in his study.

ICT infrastructure is an important resource of modern library or information centre. In the study of ICT Infrastructure in Special Libraries in Kerela, Mohamed (2006) has revealed that the libraries of Kerala apply ICT for providing efficient

services. The investigation also shows that majority of the special libraries have basic hardware facilities like servers, computers, printers, barcode printer, and barcode scanner, etc.

College libraries play an important role in keeping pace with modern development in information technology and information service to the student, as Sinha and Bhattacharjee (2007) studied. The study concluded that the status of computerization of library housekeeping operations and computer based library services of college libraries of Southern Assam was in nascent stage. Only few colleges, which are best colleges affiliated to Assam University, Silchar have started implementing project of automation and networking their college libraries which serve of the students more better. The study suggested that Government of Assam and UGC should come forward to provide substantial financial assistance to the colleges located in the remote areas of South Assam, which is popularly known as Barak Valley to start with modernization of their college libraries and services so as to bring these colleges at par with the college libraries located in other parts of India. ICT in fact encompasses any medium to record information (magnetic disk/ tape, optical disks (CD/DVD), flash memory etc. and arguably also paper records); technology for broadcasting information- radio, television, and technology for communicating through voice and sound or images- microphone, camera, loudspeaker, and telephone to cellular phone.

Libraries and Information centres have been employing ICT and electronic information resources and delivering services to satisfy the diverse information needs of their users. Gupta (2009) in a study investigated the views of the users towards e- resources provided by CSL library. The finding of the study have shown that most of the users are using computer daily and revealed that CDRL library uses LINUX Windows NT and Windows 98/2000/XP operating system for networking purpose which are useful in automating the library.

While conducting a national survey of the status of school library automation in Malaysian Chinese secondary schools, Tee Lay (2010) revealed that the Malaysian Chinese secondary school libraries started automation during 1990s and have been actively involved in library automation projects since 2000. It also identified important factors in determining the system used and areas, need for future planning, initiatives in implementing library automation, etc.

Research Gaps Identified in the Proposed Field of Investigation

Under the above review, it has been clarified that no research work has been done in the current research study. It will be the first research work by the researcher

who will reveal the state of the application of information technology in the selected school libraries of Delhi. So there is a considerable distance between research available and current research research.

Objectives of the Study

- Recognize the need for information technology in libraries.
- Information about the various software used in library digitization and the usefulness of their methodology.
- Responses to the implementation of Information Technology in the selected school libraries of the State of Delhi (To identify appropriate, useful, economical and simple rules from the methods used in the information mechanism)
- To study the difficulties in the implementation of Information Technology in the selected school libraries of the State of Delhi.
- Analysis of the impact of information on employees working in libraries from information technology.
- Evaluation of benefits and services from digitization.

Hypothesis

The proposed research report is based on some important concepts: The following hypothesis for this research work has been created: -

1. Information technology in the libraries of the State's School is developing.
2. If proper use of Information Technology is used in Library, than they lack its systematic implementation.
3. The present practice of information technology is boosting in libraries of the Selected School of Delhi State.
4. In the school's library, the status of trained employees in the service of the ICT is not satisfactory.
5. In the absence of proper Student's training, the response of Studentin using ICT based automated Library remains negative.

Source of Information

1. Books
2. Journals and Magazines

3. WebandInternet

Other tools and Research Methods

The tools and research methods used in this study will be the primary sources of research. In the absence of which, we cannot build research-oriented building. Therefore, the selection of appropriate, competenttools and procedures for the quality, authenticity and utility of research should be extremely prudent.

Method of Research

Out of many methods available for any research, any one can be adopted. And here I as a researchers will use the survey method for my current study. Survey method is such a significant method, when it is to identify, what is the behavior of normal or representative situations in the present state. Hence we found the survey method to be most appropriate.

Justification of the study:

Collections of responses related to the survey work will be done from the selected school of Delhi state.

Responses will be collected from the selected school of Delhi statethrough questionnaires and interviews, in which the samples will be collected from the following consumers.

1. Librarian
2. Faculty
3. Student

A total of 200respondantswill be asked to fill a questionnaire for the comparative analysis, and on the basis of the data obtained the results of the research will be measured using the statistical method. We hope to get feedback from around 70% of respondants. The table and Graph will be displayed as per the requirement and comparative study will be done.

Extraneous

Many research methods will be used in this research such as-

1. Questionnaire and Interview
2. Reviews
3. Survey

4. Statistical Tests

Questionnaire is a technique by which we can easily learn about users and their needs. Questionnaire will be divided into two parts.

Part I: - Personal details of consumers and

Part II: - Details regarding their requirements and usage procedures will be given.

Based on the received questionnaire, the available facts and data a comparative analysis will be done on this basis. Therefore, in this research, both the direct and indirect questions will be collected and analyzed by the statistical method so that the situation can be understood properly.

This Thesis is divided into following chapters as follows:

1. Introduction
2. Review of Literature
3. Research Methodology
4. Data Analysis
5. Findings, Conclusions and Suggestions.

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Digital Literacy Competency and Parameters for Measuring Teaching Performance of Educators

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Abstract: The advancement of technology in artificial intelligence, cloud computing, web 2.0 tools allow to personalize teaching and learning practices. The utilization of big data in education allows to direct educators, researchers and instutions. The paper is intended to focus on Digital literacy competency, virtual education, teaching performance, parameters of the teaching performance of educators. It delineates teaching as core activity, articulates the standards and criteria for assessing teaching performance, and put an example of contributions and achievement of teaching and education in digital environment. The performance can be tested by means of resource utilization, fulfilment of users' needs by maintaining quality and standards of education. The various objectives may be monitoring, personalization, support, assessment, and feedback. The study elaborates digital skills and its utility, technology literacy, and various pedagogical aspects. Teaching effectiveness methods, measures and its utility will be outlined. The conclusion part will be focusing on quality, sophisticated, systematic and flexible teaching for better learning output.

Keywords: Digital competency, Digital literacy, Web 2.0, educator 2.0,3.0, virtual teaching and learning, parameters, performance measurement, teaching effectiveness, teaching techniques.

1. Introduction

The technology and its advancement are boon to society. The web 2.0 technology such as RSS, blogs, wikis, SNS allows to enhance teaching-learning and performance. Artificial intelligence, cloud computing, robotics, machine learning, coding are current trends in education system. Teaching is a noble profession where various things are taught and learnt by the process of attending needs and utilizing experiences. It is a continuous development where one should know to develop in various areas as per the need of hour. It can be considered as a domain of activity for facilitating learning and development, quality teaching, culture promotion, curriculum and pedagogy development, management of programmes events and many more. Teacher is the main source for obtaining, creating and disseminating knowledge.one should be aware of the changing technology and cope up with the speed to maintain the standard of education and its parameters. The awareness of resources, what areas should be covered, how structured it should be done for better learning results should be taken into consideration. The involvement of teaching should reflect with what intensions someone is teaching by considering

people's feelings, needs and future. Teaching is teaching until something is gained from the things which have been taught. The education should be considered as process of learning and problem solving where teaching should be flexible not static in nature and one should be eager to know, investigate and experiment variety of concepts for better utilization of tools and technology in teaching phase. The educator should explore himself/herself in best possible way to create new concept, and utilize the created concept in teaching process. self - development of educational leader is an important dimension in area of work. As one grows one should try to innovate teaching approaches for management and better output. There is consensus that highly effective and well qualified educators play an important role to improve performance of student and achievements but the question is how to measure teacher's effectiveness? The output of teaching should reflect on student's success, teaching that improves students understanding and learning. Teacher effectiveness can be considered as positive output in students achieved scores. Teacher, teaching and its effects in knowledge creation among learners is most important task as being an educator. To cater the need of learning one must be updated and take interest in learning diverse areas. Today's era is expecting a lot from educators either it may concern quality, efficiency, content delivery, technological usability, digital competency, literacy etc. Teacher who cares about quality and development of teaching as a passion and profession are real means of educator. The assessment of performance in teaching is strategy for enhancing expertise of teachers and improving the quality of teacher preparation the performance assessment in teaching. Darling-Hammond and Hyler (2013) noted about national board composed teachers' at large extent was first professional work to create assessments for teaching and set standards. The assessment through which teachers are evaluated focus on learning goals and its planning, need of student, engagement of students and purposeful instruction and its reflection result, how to evaluate learning of students, and how to plan for individual and as a whole. The present era is experiencing vast change in literacy and competency either it may be digital literacy, media literacy, mobile literacy, technology literacy. One should be updated with current tends and technology to make better utilization in teaching, learning, and in research advancement.

Digital Literacy

Digital literacy can be said as literacy of digital aspects such as web tools and technology, access of internet, find, edit and modify digital contents. It relies on contextual knowledge, adaptability and usability of various sources. The term Digital literacy emerged first in 1997 by Paul glister. Digital literate skill of a person allows one to engage in online mode, collaborate, communicate, share information

in digital environment. The ability to efficiently use digital tools, evaluate resources and make it use in lifelong learning activities can be termed as digital literacy. The concept digital literacy is somehow associated to Information literacy, computer literacy, media literacy, multi-modal literacy and is been connected to use digital resources, devices and applications in teaching and learning process. The information skills, ICT competency and its role in development of society and balanced attitude towards technology allows one to be called as digital literate. The competency encompasses various aspects such as browsing of information, searching, evaluating, filtering, storing, retrieving, sharing with the help of digital channels, problem -solving, creativity in teaching and learning, data security, innovative etc.

Skills

A competency can be said as a person's characteristic which enables them to perform at superior level in a provided situation or environment. It can be referred as combination of skills, knowledge, behaviour which are important for self-growth, organizational performance. In libraries competency would reflect the knowledge, proficiency of information resources, accessibility, management, research, technology friendly so as to provide services to users as per their need. Student/teacher who is computer literate or digital literate must possess certain skills: -Information task definition - Information seeking strategies - Location and access - Use of information - Evaluation of collected information – Synthesis.

Levels of Digital Literacy

Level 1 -Digital competence (skills, concepts, attitudes, approaches)

Level 2-Digital usage (professional, discipline application)

Level 3-Digital transformation(innovative/creative)

Process of Digital Literacy

Statement - Identification – Accession – Evaluation – Interpretation – Organisation – Integration – Analysis – Synthesis – Creation – Communication – Dissemination – Reflection**.**

Defining Teaching Effectiveness

There is an impact on how teacher effectiveness is conceived and influences the development of education policy. Teacher effectiveness refers to ability to enhance learning of student by students gain on standardized achievement test. Teacher efficiency, knowledge, proficiency is an important aspect of teaching ability. Effective teachers equally treat all students, have expectations and help

them learn by various measures such as test based growth measures. They contribute development in classroom by using diverse resources to plan learning opportunities, monitor progress of students formatively, evaluate learning by using multiple sources of evidence. They ensure personality growth and success of learners and assure low risk of failure, try to positively contribute to academic and social outcomes for students such as cooperative behaviour, self-efficiency, regular attendance. The basic skills and effectiveness a teacher should acquire is expertise in content and its delivery, course design and management skills, instructional design assessment and delivery skills." Evaluation criteria for performance appraisal of faculty members" is a study of interdisciplinary study which is situated amidst the education quality concern (Miller & Miller,1972). The effectiveness of teacher can be represented by learning outcomes and successful result rate of students. The classroom is basic learning setting and accessing outcomes of students which reflects teacher's efficiency. Various challenges have been recognized in teaching and learning methods. Formative and summative strategy should be followed by teachers for effective evaluation of student's performance (Parkes ,2010). For the learning process various dimensions are considered such as learning perception and positive attitudes, cognitive thinking and integrating new learning, refining knowledge and extend thinking, meaningful use of knowledge, productive mind. Assessment of teacher, student is most important for improvement of one's personality (Marzano, Pickering & McTighe ,1993). The effectiveness of teacher can be observed by Value -Added Models, classroom observation, principal evaluation, analysis of classroom artifacts Portfolios self-Report of practice and student Evaluation.

Effective Teaching Techniques

A technique can be stated as guidelines or rules for any activity related to teaching or other. It can be strategy, method or description of activity steps, can be a procedure for completing specific task. Nowadays only being a teacher is not enough to fulfil the need of learner.one should be smart educator in every aspect either it may be in communication skills, interpersonal skills, technology competency and also be a dramatic success. Evaluation of teaching quality of educators has great impact on progress on teaching quality. It plays an important role in effective process. The educator's main focus be on some criteria such as providing booklet, using suitable examples, answering questions, active participation and supervision, competency in lessons etc. which helps to evaluate quality of teachers (Mahmoudi, Nasri & Gholinia ,2013). Teachers should try to enhance his /her skills, create ideas and try to use it in classroom teaching in enthuastic manner. There are several skills for being successful educators' dramatic repertoire.

Figure:- 1. Types of teaching approaches

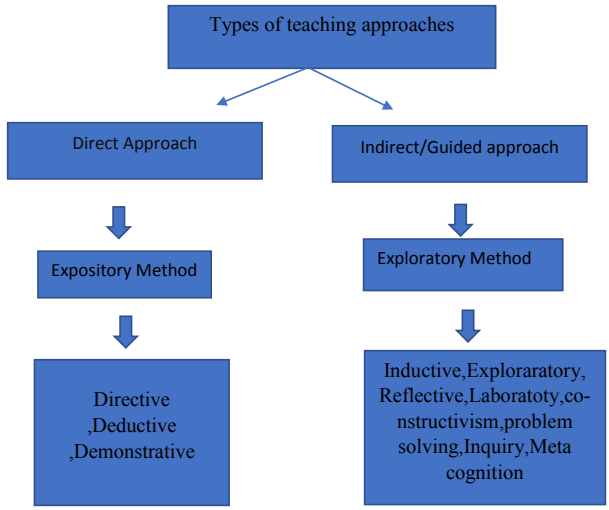


Table 1. Constituent of teaching activities

i.	Subject mastery-one should be master in his matter before providing knowledge to others. The content mastery will help one in effective teaching and learning process.
ii.	Idea creator-one should be a creator, either it may be of ideas, concepts. Innovator of teaching techniques will enhance one's self confidence and make one to do more better in various aspects.
iii.	Develop lessons-creative in developing curriculum/lessons, teaching methods impacts positive in teaching and learning process
iv.	Motivational person -Positive, motivational, passionate teacher in classroom will help the learner to acquire more by participating in classroom activity.
v.	Vocal pitch, volume, voice rate, quality helps to enhance one's style and expressiveness.
vi.	Physical animation-physical gesture, presence helps to describe and clarify doubts and points. The movement in class with energetic mode will make students more attentive in learning.
vii.	Patience-having patience in class is one of the good things in one's personality.
viii.	Classroom management-dynamic skills and patience will enable to manage class and help in smooth functioning in teaching learning activity.
ix.	Compassion for students-to understand students need and to cope up which is a good sign of any educator. willingness to help student in each and every level and try to know their opinion is also a good sign of teacher.

1. planning	-Content expert which show mastery in specific subject area -Learner, materials designer, Creative planner, goal setter, process observer, -Meet objectives of the curriculum -Design and development of Pedagogy and curriculum, stated activities, modelled activities, guided practice, checks for understanding, feedback/ evaluation, review -Learn new techniques and keep abreast of trends and technology. -Design materials to promote interaction, integrate appropriate teaching methology.
2. Instruction	-Facilitator, content transmitter, speaker, integrator of resources/ media. -Use methology as per the requirement of class. -Provide guided practice, Feedback provider -Effective use of resources, media, technology, illustrations -Questioner, Learning and development facilitation, Promote teaching quality and culture -Use of effective questioning technique -Monitor progress of student, consultant -Check understanding of student
3. Management	- Enforcer, Director, Assignor, Time monitor, referee -Group work management efficiently and effectively -Management of time, resources, -Managing subjects and programmes -organized managed and prepared -Management of class by establishing rules and regulations -Avoid digressions by keeping progress of class on target and be responsible
4. Interpersonal relations	-Listener, counsellor, motivator, negotiator, atmosphere creator -Interactive classroom manger -Communication ice break -Build positive relations with students -Motivate and inspire to learn -Support in progress of student -Keep motivated and be friendly with students, encourage students in actively participation.

Parameters of Teaching in 21 st Century

The advancement of technology has been proving as the boon to society in upliftment of methods, standards and quality of teaching and learning process. Quality education is core concept of any society for better research output and invention. The traditional teaching methods has been somehow replaced by

technology. 21st century education changes and development can be considered as learning of new environment, learning of new content, new technique of teaching and learning, new process of learning, various types of learner, new dimension of learning, new framework of teaching.

The environment in teaching and learning plays an important role in gaining knowledge and being satisfied at an extent. It can help to be innovative by accepting new tools and technology where education is student centric and learning goes beyond the boundaries of classroom. The focus in 21 st century teaching is basically on teacher-learner, learner-experts interaction with the appropriate use of ICT and its tools. The difference between traditional teaching and 21 st century teaching are as follows.

Table 2. Traditional teaching vs 21 st century teaching

Traditional teaching	21 st century teaching
Teaching with books, materials	Teaching with the help of technology and tools
Teacher cantered	Learner cantered
Less interactive teaching	Interactive teaching
Supply driven	Demand driven
Individual learning	Collaborative, cooperative team learning,
Emphasis on subject knowledge	Focus on intellectual abilities
Formal settings-school, colleges	Informal, non-formal settings, online classes, distance education
Physical learning	Virtual learning

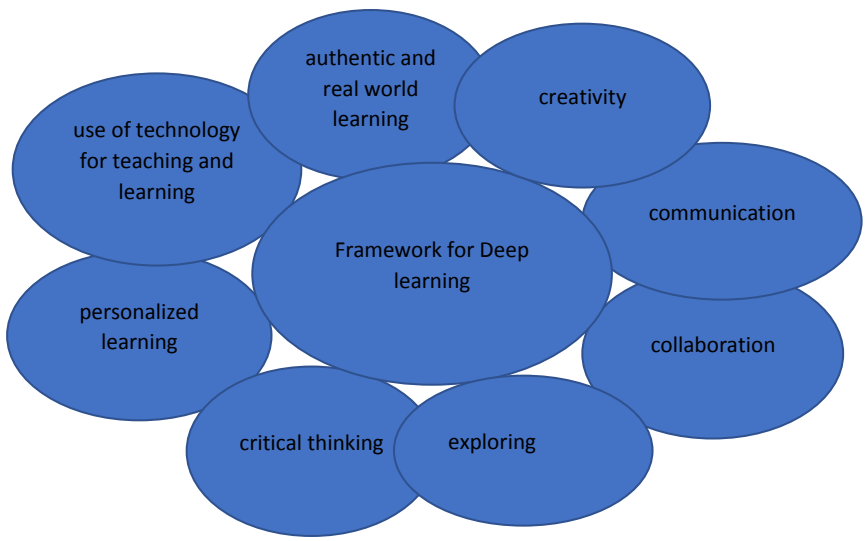
Teaching in 21 st century should be flexible and adaptive in nature as per the new generations need such as different set of values, thinking, population culture, ethics, different way of responding, reacting and learners getting motivated. The learner is much smarter as earlier as due to techno -savvy, digital skills, come from diverse background, poses varied cultural stuffs. They usually possess new traits of identities, creativity, open mindedness, independent, enterprising minds. The new teaching techniques should be adopted to satisfy the learners via taking modern day classes in museums, parks to enhance real life experience of learners. Application of web 2.0 tools such as Blogs, Wikis, RSS, social networking sites such as Facebook, WhatsApp should be adopted for content delivery platform. Telegram should be used as a platform to share knowledge easily and efficiently. Live teaching sessions should be conducted with the help of online platform

such as Zoom, Google meet, canvas, Moodle Google classroom, Sakai, Edmodo, Schoology etc.

Framework of Teaching and Deep Learning

Teaching and learning framework can be said as models for achieving teaching and learning goals with activities in classroom, create positive environment and motivating. Framework serve as blueprint for planning, implementing and adaptation of any new concept such as course addition, syllabus updating. Effective learning and teaching framework emerge from cognitive, educational and sociological research findings. It integrates discussion, active learning, participative learning, self-reflection and assessment. It provides diverse approaches that allows learners how and when to use the skills which have been learnt by them. Learning focus on continual growth development. Techno driven framework should be adopted and continued for better teaching and learning outcome.

Figure 2. Framework of teaching and deep learning



Performance Measures

It is the measure of teaching activity and meeting goals and standards and let us know the satisfaction level of learners. It lets to know the actual performance and if any improvements are needed in service. These can be called as a tool to help understand, manage and improve the demand of learner. It is concerned with the process where effectiveness and efficiency of learning process is taken into consideration. It focuses on expansion, innovation and improvement of work

process for better teaching and learning process. Without measuring performance in teaching, education is just like a pilot flying plane without any destination. To measure performance of teaching process quality teaching, time management, coordination, accuracy, assessment, measurements, control, expertise are considered. The basic concept of effective performance measurement involves:

1. Planning and meeting standards which has been defined such as performance goal, performance measures, career planning, professional development, reach extensions.
2. Choosing objectives with alignment of organisations missions by achieving teaching performance at next level.
3. Design performance measures and to identify learner's requirement and fulfilment of the same.
4. Setting standard of performance at which educator performance will be evaluated to account for changing circumstances and to know process of teaching and learning.
5. Adopt performance measurement process by detecting deviations in process of teaching.
6. Use measurement results to take action for professional development, to reveal problem and try to resolve, to know how to improve and focus on betterment.

Table 3. Qualities of Educator and Learner

Educator Qualities	Learner Qualities
Thinker, principled, resilient, communicator, self-managed, open minded, professional practice and learning, assessment and reporting, experience of learning, learner cantered pedagogy, assessment, learning concept, Technology enabled teaching,21 st century competencies, strong foundation, support, increase effectiveness, teaching plan, skill, attitudes, knowledge, digital literate, creative thinking, collaboration, performance task, success, skilful teaching	Learning interest, technology awareness, learning attitudes, communication, learn in different ways, adopt to change, are diverse, come with prior knowledge, learn from others. Progress at different rate, are capable of learning, diverse success, have different needs, are motivated in different ways, motivated, active learning, visible thinking, personalized learning

Tools to Measure Educator Performance and Skills

Teachers effort can be measured by adopting various tools listed below: -

1. Tools for measuring attendance and activity-special purpose absenteeism surveys of teacher as attendance easy and effective indicator of system performance for teacher's presence which is essential for learning. - Quality of special delivery of contents example-survey delivery indicators initiative in Africa.
2. Tools for measuring teacher knowledge and skills-pedagogical knowledge and content test from service delivery surveys and administrative processes example - test embedded in recruitment of teacher. Teachers knowledge of content usually predicts standard of teaching and learning.
3. Tools for measuring teacher performance and skills the way teacher teaches-To observe performance video-based observation such as TIMSS video studies in Indonesia, teacher evaluation system in chile can be taken into account and systematic observations in classroom by trained observers can be considered which allows teachers the skills and competencies of teacher and how they use the same for better teaching.
4. How well educators promote learning-The tools for student learning and measuring effect of teachers can be simple metrics of performance of learners mapped to educates and teachers value assed calculations can also be taken into account. It helps to measure is teaching effectiveness and helps to control non-teaching factors influencing teaching.
5. Multiple approaches to measurement-It indicates -Are teachers available on time? Do teachers know enough? How expert they are in teaching? And how easily and well they promote learning? Worldbank.org (2020).

2. Conclusion

In digital technology world a teacher can be defined as educator 2.0 and 3.0 who has the art to cater the need of learners. The effective teaching leads to better understanding and learning outcomes. The main focus of any educator should be on student and its achievements which will led for better result and helps in teacher's personality recognition. The technique adopted in teaching plays a vital role in grasping knowledge and utility of it in right direction. To gain better

understanding of teaching well-conceived system should follow approaches. The teacher and administrators should come forward to work unitedly to create a sophisticated system which supports teachers teaching and evaluate them at interval. The sophisticated e-teaching techniques for better learning output such as E-management of classes, electronic engagement for upload of assignment, presentation of class exercises, e-guidance of educators should be done efficiently. The virtual platform such as Google classroom, Zoom, Google meet, Sakai etc. should be adopted at an ease to enhance teaching and learning process.

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Role of Digital Libraries in the After COVID 19 Scenario

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Abstract: Education is very important in today's world, but today the way of learning is changing rapidly and now library is playing an important role to provide better education because of COVID 19, because we all know that libraries. There is an infinite storehouse of knowledge. Presently, printed books and database are being converted into digital / electronic format. With the dramatic changes taking place in society, the exponential advances of everything are easily recognizable. Due to the emergence of the digital world in digital environments in response to growing digital collections and changing behaviour of digital users. The paper mainly presents a brief description of how effective the role of the digital library after COVID 19 is.

Keywords: Digital Library, COVID 19, IT, Library.

1. Introduction

Digital libraries have been a major role in Covid 19, allowing students, researchers and faculty to carry out their projects, research work."To give the right information to the right users at the right time and in the right format" Providing the right information at the right time to the necessary person is the main objective of the modern library. Automation is no longer a new phenomenon in libraries. Computers are playing an important role in the transfer of information and have become a part of the librarianship. Libraries are organizations that provide resources, including staff, to select, structure, provide intellectual access, interpret, distribute, maintain integrity, and ensure the timely collection of digital works they are easily available for use by a group of communities.

One definition of a digital library is "Managed collection of information with related services, where information is stored in digital formats and accessible to the network". Digital libraries are organizations that provide resources, to choose the structure, provide intellectual access, interpret, distribute, preserve integrity, including specialized staff and ensure timely persistence of the collection of digital

works are so that they are readily and economically available for use by a defined community or group of communities. (Digital Library Federation)

Digital Library

The concept of digital libraries is routed in the age-old dream of creating a virtual library. But digital library is different from the virtual library because of its physical identification.

Definition of 'Digital Library' "The work of library materials and services can contain remote access, bibliographic news, electronic texts, all types of information through banks and computer networks, from any point of view." The digital library can be called a 'wall-free' electronic workstation to accessing universal knowledge, despite the remote location of information.

Former the user point of view. "Digital libraries are systems that provide a community of users with coherent access to a large, organized repository of information and knowledge."

Lbrahim says "Digital libraries differ significantly from the traditional libraries because they allow users to gain an online access and work with the electronic versions of fulltax documents and their associated images". Many digital libraries also provide an access to other multimedia content like audio and video.

The creation of digital libraries is collected and organized by the community of users and their functional capacity supports information needs and community users.

Covid 19

1. Wearing facemask is compulsory for all Users and staff members in the Library. Without a mask, you will not be allowed to enter the Library.
2. Avoid touching anything, even the door handle, other than required while in the Library premises.
3. As per the social distance norms, Library can accommodate a maximum of 20-30 users at a time. Hence visit Library when it is necessary.
4. You should avoid standing in a group in and around the Library and if you show signs of a cough, cold or fever, please do not visit Library.
5. Library computers (including OPAC system) are not available temporarily. Use your devices to check the online catalogue.

6. Circulation of print journals/magazines is temporarily suspended. So users are encouraged to read them online.
7. As a precaution, we have closed the baggage counter temporary. So you are advised not to carry unnecessary bag, or any personal belongs item to the Library. If you bring anything other than reading material, you will have to place them outside the Library at your own risk.

Objective of the Digital Libraries

To understand digital information services in Covid 19.

To understand the issues and challenges in digital services in Covid 19.

In this difficult time collecting, storing, accessing and disseminating information in digital form.

To cater to the needs of users in this difficult time by providing better services effectively 24x7.

To save time of patrons as well as library staff.

Hypothesis

- Digital library is very important in Covid 19.
- Digital library is very essential in the era of ICT.

Methodology

The methodology is also very important for researchers to choose the appropriate research method within a range. The methodology of the research provides details about how the researcher obtains the data to carry out the research. This study is a review of related literature as well as using both qualitative and quantitative approaches. Conceptual and textual information related to the current study has been collected from primary and secondary sources and books and national and international journals have also been used for archive information.

Advantages of Digital Libraries

A digital library is not limited to a particular location or so-called building is distributed all over the world. The user can access their subject information on their own computer screen using the Internet. Actually, it is a network of multimedia systems, which provide access to the fingers.

Availability: Digital libraries can be accessed anytime, anywhere 365 days of the year.

Access: Many users can be access subjective topic relevant and recent information and knowledge simultaneously.The same resources can be used at the same time by a number of users.

No boundary: The user of a digital library need not to go to the library physically, As long as an internet connection is available, one can get information and knowledge from all over the world.

Storage: Digitalization is a long-term preservation and conservation solution for physical storage.

Space: While traditional libraries are limited by storage space, digital libraries have the ability to store a lot of information, simply because digital information requires very little physical space to hold them.

Networking: A specialized digital library very easily provides a link to any other resource of another digital library, thus a seamlessly integrated resource sharing can be achieved. 24X7 hours availability. The global community is at your fingertips with line learning.

Cost effectiveness: The cost of maintaining a digital library is much lower than that of a traditional library. A traditional library has to spend large sums of money to pay for staff, book maintenance and additional books. Digital libraries overcome these fees. There is almost unlimited storage space at a very low cost.

Issues of Digital Libraries

Computer viruses, lack of standardization of digital information, quick degrading properties of digital content, various performance standards of digital products and the associated problems, overuse of monitors, many times make digital libraries a handicap by the nature of health hazard of radiation, etc.

Access speed: - As more and more computers are connecting to the Internet, its access speed is getting reduced considerably. If the new technology will not try to solve the problem, the Internet will be full of error messages in the near future.

Bandwidth: - Digital library requires high band for transfer of multimedia resources, but bandwidth is decreasing day by day due to its high usage.

Efficiency: - With the much larger volume of digital information, finding the right material for a specific task becomes increasingly difficult.

The initial cost is high: - The infrastructure cost of digital library, i.e. the cost of hardware, software; leasing communication circuit is generally very high.

Environment: - Digital libraries cannot reproduce the environment of a traditional library. Many people also find reading printed material to be easier than reading material on a computer screen.

Preservation: - Due to technological developments, a digital library can rapidly become out-of-date and its data may become inaccessible.

Personal Issues: - There should be new systems and services for the commitment of employees. There should be advanced training programs for staff.Automation impacts employee skills and professionalization.

Legal issues: - Digitization violates the copyright law as the thought content of one author can be freely transferred by another without his acknowledgement. So,one difficulty to overcome for digital libraries is the way to distribute information. How does a digital library, distribute information at will while protecting the copyright of the author?

Challenges faced by librarian in digital information services

Access and evaluate information: Access information efficiently. Critically and competently evaluate information. Manage the flow of information from different types of resources. Apply a basic understanding of the ethical / legal issues surrounding access and use of information.

Transition to Digital Content: Overdrive has developed custom download websites or virtual branches, they feel that your library branches should be worldwide.

Finance Challenges: The costs involved in generating production and dissemination of digital environment are quite high. Customers have to pay a fee for access to digital services and collections. The major hurdle is digitization and it is very intensive.

Suggestions

Training should be conducted for databases for employees as well as users for better use of digital library.

A systematic process should be developed to understand the current requirement of the users and try to find a solution to meet the user's need.

Well organized user training programmers and online tutorials are required to conduct complex subject searches in the digital library and to educate the user to make full use of available technologies, resources and services.

Employees are required to learn new skills as the roles of librarians and libraries are constantly evolving, which processual parallels the development of acceptance and use of digital information.

Digitalization of archival materials should be used as sporty technique to enhance its access and use of technology for conservation, preservation and dissemination of its content.

2. Conclusions

It has been concluded that digital information services in Covid 19 are an essential part of the library environment and should be given special attention while providing digital information services to end users. To serve and succeed in the futures of libraries, they will have to change their role in digital libraries of Dynamics Electronic Multimedia Documents from fixed print material store houses. National and international cooperation and collaboration have become essential for the development of digital libraries.

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CSIR-NKRC Consortia and its Contribution towards CSIR-National Geophysical Research Institute (NGRI), Hyderabad: An Overview

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Abstract: The paper study analyses the e-resources available in CSIR-National Knowledge Resource Consortium (NKRC) and the access facilitiesof e-resources by its lab contribution of CSIR-National Geophysical Research Institute (NGRI), Hyderabad and also explain the need, merits, demerits and different consortium models etc.

The emerging technologies and rapid growth of information literacy has changed the scenario of R&D institutions to disseminate the research output of S&T research areas. Consortiums are becoming the main platform for resource sharing and thus increase scientific productivity of member institutions in terms of quality and quantity. Every resource is needful for the researchers, but it has also reflected deep impact on thequalitative and quantitative character of the resources concerned. Exploration of research literature is on the exponential curve. In this context, it demands the profitable way of accessing the S&T e-resourcesis high-priority for all the Department of Science and Technology (DST) and Council of Scientific and Industrial Research (CSIR)laboratories. The National Knowledge Resource Consortiumis a platform to allocate core S&T online resources (8000+ e-journals from28 major global publishers and databases like Elsevier, Springer, Wiley-Black well, RSC, AIP, IEEE, Web of Science, etc.) to all its 39CSIR and 26 DSTlaboratoriesin a substantive cost effective manner.

Keywords: National Knowledge Resource Consortium; E- journals Consortium; E-Resources;

1. Introduction

Consortiums are often found in the non-profit organisations mainly among the educational institutions and research institutions to share to pool their resources among the groups to benefit their students and research community. Consortia are a boon to libraries in the digital environment enhancing the power of online access to a variety of information resources.

Library Consortium is an Association of a group of libraries to share their resources to achieve common objective. It is felt that the concept of E-Journals consortium is much effective and more benefited to the libraries without requiring additional expenditure to access the e-journals.

Definition

Library consortium is a group of two or more libraries which have agreed to co-operate with one another in order to fulfil certain similar needs, usually resource sharing. It usually, refers to co-operation, co-ordination and collaboration between, and amongst, libraries for the purpose of sharing information" (Bajpai, et.al, 2009)[1]. A library Consortium formation can be local, regional, state, national and International level.

Need and purpose of a library consortium.

- Literature explosion
- Different types of user needs and requirements
- Financial shrinking.
- Improve the quality of library services
- Enhance the digital preservation and archival access
- feasibility of self-sufficiency

Advantages of E-Journals Consortium

i. Get the access of a wider range of electronic resources at cheaper cost.
ii. Explosion of information at 24*7 and multiple access at a time.
iii. Rational utilization of financial resources.
iv. Avoids duplication of resources
v. Enhance the search ability, it provides value addition such as alertingservices, links from one article to another, forwardlinks (citing articles), etc.
vi. Analyse the usage statistics and recovery of cost incurred onthe subscription of e-journals.
vii. Provide to create a single interface for resources database.
viii. developing a union catalogue among participating libraries.
ix. Exist for digital preservation and archival collection of access.

Demerits of E-Journals Consortium

i. Ethical issues, Copyright problems and misuse of research material.

ii. Lack of archiving and back volumesavailability.

iii. All available resources may not be useful to all theparticipating libraries due to varied group.

iv. Internet access is mandatory to get access.

v. Requires high budget at the beginning to investment in license and ICT.

vi. Users interested to read in printed material, in absence preferring to read e-journals.

2. Consortium Models

- Open Consortium: This is an adjustable consortium in which any institute or organisation can bejoin and leave in this consortium as and when required. Example INDEST Consortium.
- Closed Group Consortium:It is a within limit and pre-defined group of consortium. It is developedeither by affiliation and collaboration among them. Establishing of this consortiums are based on operational guidelines for fairly use. Example as CSIR, DAE, IIM Consortium.
- Centrally Funded consortium: In this model, consortium will solely depend on the parent body. A few examples are INFONET by UGC, ICMR, CSIR by DSIR.
- Shared-budget consortium: In this model the participating libraries take the lead and form the consortium. IIM and FORSA are examples of this model.
- Publisher Initiatives consortium: This type of consortium created on publisher's platform, to get all the resources in a single platform to get the access of all e-journals. In this consortium members will get deep discount on the available resources. An emerald E-Journals collection published by the Emerald Publishing Group is an example.
- National Consortium: These are the service providing consortiums at national level licensing of products. INDEST-AICTE, UGC Infonet are the examples.

3. E-Journals Consortium India

In the global perspective there has been a trend in academic as well as technical / special libraries foradopting consortium model for accessing to electronic resources over Internet. In India the consortium approach for subscribing to e-journals and databases has been mounting year by year. UGC-INFLIBNET and MHRD have takeninitiatives to give access of scholarly online journals to the academiccommunity of India by establishing e-journals / Digital Library consortium.

Some of the major national and international e-journals/ digital library consortiums.

Sl	Consortium	Initiative by	Collection	URL
1	e-ShodhSindhu	MHRD, India. Collaboration of UGC-INFONET Digital Library Consortium, NLIST and INDEST-AICTE Consortium.	For Higher Education E-Resources archival access to more than 15,000 core and peer-reviewed journals	https://ess.inflibnet.ac.in/
2	NKRC	CSIR& DST	10000+ peer reviewed Journals	http://nkrc.niscair.res.in/index.php
3	DeLCON	Department of Biotechnology Ministry of S&T, Govt. of India	1000+Journals	http://delcon.gov.in/about.php
4	CeRA(Consortium for e-Resources in Agriculture)	Indian Council of Agricultural Research (ICAR)	3000+ peer reviewed journals	http://cera.iari.res.in/index.php/en/
5	ScienceDirect Journals	Elsevier	2500+peer reviewed Journals	https://www.sciencedirect.com/
6	Springer Journals	Springer Publishing Group	3000+ peer reviewed Journals	https://www.springernature.com
7	Wiley Online Library	Wiley-Blackwell	1600+ Journals	https://onlinelibrary.wiley.com/

8	J-Gate	Informatics India Limited, Bangalore	50000+ Journals	https://jgateplus.com/home/
9	JSTORE	ITHAKA, a not-for-profit organization	250+Journals	https://www.jstor.org/
10	IEEE Xplore Digital Library	IEEE/IET Publishing	225+ Journals	https://innovate.ieee.org/

Apart from the table there are many more E-Journals consortiums are formed to share their research literature among their group of institutions like DRDO E-Journals Consortium, FORSA, ICMR E- Consortium, MCIT Libraries Consortium, HELINET Consortium etc.

4. Council of Scientific and Industrial Research (CSIR)

Research output assessments are increasingly becoming an integral part of research and development institutions worldwide. Among the research and development institutions in India, the Council of Scientific and Industrial Research (CSIR) is a leading contributor to India's R&D output.

The Council of Scientific & Industrial Research (CSIR) is the premier Industrial R&D Organization in India, constituted in 1942. It is an autonomous body registered under the Societies Registration Act of 1860 having its Office at AnusandhanBhavan, Rafi Marg, New Delhi. It is India's largest R&D Organization having a network of 39 laboratories with each laboratory pursuing cutting edge research in various areas of chemical, physical, engineering, biological and information sciences. CSIR's R&D efficiency and experience strength about 3500 active Scientists supported by about 6000 scientific and technical personnel.

About CSIR- National Knowledge Resource Consortium (NKRC)

The National Knowledge Resource Consortium (NKRC), established in year 2009, is a network of libraries and information centres of 39 CSIR and 26 DST institutes. Each CSIR and DST Knowledge Resource Centres (Library) are considered as Nodal member of NKRC.

CSIR E-Journals Consortium-NKRC's origin goes back to the year 2001 is a network project under 10th five-year plan to bridge-up and strengthen the constant decline of journals information base in CSIR labs/institutes. NISCAIR is one of the

constituent units of CSIR in the area of information science has been entrusted implementation of this projects aims providing access to 8000+ peer reviewed e-journals to all S & T personnel of CSIR through pooling and sharing resources.

At the beginning, in this direction was made in 2002 when CSIR entered into an agreement with M/s Elsevier Science to access their 1500+ journals. Presently, agreements have been done with 18 publishers facilitating access to 5000+ world-class e-journals to all CSIR and DST S&T staff. Over a period of time, the Consortium not only grew in terms of the number of resources but also in terms of the number of users as more like-minded institutes evinced interest to join the Consortium.

Today, NKRC facilitates access to more than 8,000+ e-journals of 28 major publishers and 6 databases and software's. Apart from licensed resources, NKRC is also a single point entity that provides its users with access to a multitude of open access resources. The Consortium envisions emerging as a leader to serve the R&D sector with much needed information to strengthen the research and development system in the country.

There are two types of resource models in NKRC. The first and most important one is the core subscription model (Electronic subscription only), in this model NKRC subscribes the whole resources for all its 63 laboratories. The second model is the part subscription model, where the individual laboratory has to subscribe a small percentage of journals of the respective publishers and the major part is being contributed by NKRC and whole resource is being shared amongst the 63 laboratories.

The following CSIR and DST Institutes/laboratories are having the IP based access of e-resources through NKRC.

S.no	Name of the DST Lab
1	Agharkar Research Institute, Pune
2	Aryabhatta Research Institute of Observational-Sciences, Nanital
3	Bose Institute, Kolkata
4	BirbalSahni Institute of Palaeobotany, Lucknow
5	Centre for Nano and Soft Matter Sciences, Bangalore
6	International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad
7	Institute of Nano Science and Technology, Mohali
8	Indian Association for the Cultivation of Science, Kolkata
9	Indian Institute of Astrophysics, Bangalore

10	Indian Institute of Geomagnetism, Mumbai
11	National Innovation Foundation
12	Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore
13	Raman Research Institute, Bangalore
14	SreeChitraTirunal Institute for Medical Sciences and Technology
15	S.N. Bose National Centre for Basic Sciences, Kolkata
16	The Institute of Advanced Study in Science & Technology, Guwahati
17	Technology Information, Forecasting and Assessment Council (TIFAC)
18	VigyanPrasar, New Delhi
19	North East Centre for Technology Application & Reach (NECTAR)
20	Wadia Institute of Himalayan Geology, Dehradun

CSIR-NKRC homepage: http://nkrc.niscair.res.in/

The NKRC web interface in figure:1 describes the following information on the web page.

i. Details of CSIR and DST laboratory-wise Complete Address of the institute, Location and the Contact details of Director of the institute and the Nodal officer (Knowledge resource centre) of the institute.

ii. Institute access details: by publishers-wise or by respective lab wise or by journal wise.

iii. Print journal details: availability of each laboratory/institute or search publisher (union catalogue for 39 CSIR and 26 DST laboratories holdings).

iv. Holding details: Access details of each laboratory or Alphabetical list of available resources provided with hyperlinks.

v. Online Journals List: NKRC having 10000 + journals overall 28 major publishers. One can access the journals by year-wise of the publisher.

vi. Institute Login: NKRC will provide a login credentials to each Nodal officer of the Laboratory, the member has to update their lab contribution e- resources and subscriptions details etc. time to time to active the NKRC home page.

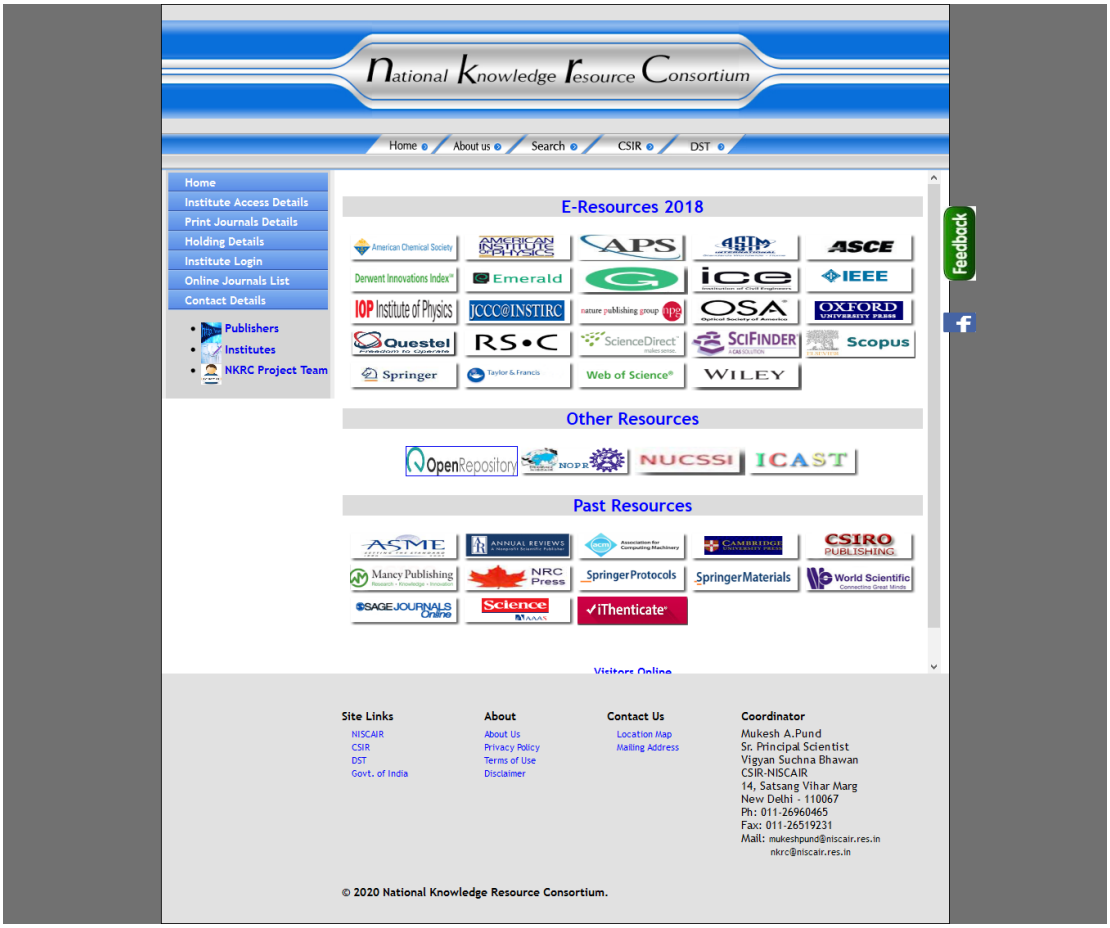


Figure 1: Home page of CSIR-NKRC

4.3 E-Resources available in NKRC:

The main purpose of NKRC is to adopt the best science practice to make CSIR and DST laboratories in information system relevant, cost-effective and vibrant. To make the process easy NKRC is going to take following steps

- Expand the Information resourcesaccording to the laboratory vision and mission.
- Maximum utilisation of available resources for the endusers.
- Develop a quality information management system through Knowledge resource centres.

- Establish a consistent information retrieval model (by making digital preservation and archival collection of e-resources) for accessing.

NKRC is procuring worldwide major peer reviewed scientific journals and databases of the international societies and commercial scientific literature publications as core subscription or electronic subscription model. NKRC Negotiation Committee will negotiate the price for all the recommended publishers to get maximum discount on journals and databases. The yearly subscriptions oftotal expenditure taken care by NKRC, thus saving huge crores of rupees to each nodal R&D institutes.

Table 1: Publisher-wise collections of e-journals subscribes by NKRC under the core subscription model for all its CSIR & DST (63 laboratories) accessible through IP based network.

Table 1

Sl.No	Publisher	Total No of Journals	Access period	
			From	To
1	Emerald	144	1994	2019
2	Oxford University Press (OUP)	99	1997	2019
3	Royal Society of Chemistry (RSC)	73	2000	2019
4	Taylor & Francis	471	1997	2019
5	Wiley-Blackwell	754	1997	2019
6	Q-Pat (Patent database)			

Table 2: Publisher-wise collections of e-journals are available under the lab contributions (Part subscription model). Individual laboratory has to share the percentage of expenditure of the respective publishers and the major share is being contributed by NKRC and the whole resource is being shared amongst the 69 laboratories of CSIR & DSTaccessible through IP based network.

Table 2

Sl.No	Publisher	Total No of Journals	Access period	
			From	To
1	American Chemical Society (ACS)	40	1995	2019
2	Association for Computing Machinery (ACM)	1577	2008	2019
3	American Institute of Physics (AIP)	18	2000	2019

4	Annual Reviews	30	2009	2019
5	American Society of Civil Engineers (ACSE)	31	2000	2019
6	American Society of Mechanical Engineers (ASME)	23	2000	2019
7	Cambridge University Press (CUP)	87	1997	2019
8	Science Direct (Elsevier)	1866	1905	2019
9	Institution of Civil Engineers (ICE)	23	2004	2019
10	Institute of Electrical and Electronics Engineers (IEEE)	151	2000	2019
11	Institute of Physics (IOP)	59	2009	2019
12	Optical Society of America (OSA)	16	2009	2019
13	Nature Publishing Group (NPG)	148	2009	2019
14	Springer	2019	1997	2019
15	Taylor & Francis	430	1997	2019
16	Canadian Science Publishing	16	2010	2019
17	SAGE	102	1999	2019
18	Science	1	1880	2019
19	World Scientific	41	2010	2019
20	Maney Journals	27	2010	2019
21	IndianJournals.com	211	2009	2019
22	CSIRO	25	2010	2019
	Standards			
23	American Society for Testing and Materials (ASTM)			
24	Bureau of Indian Standards (ISI)			
	Databases& Software's			
25	Web of Science			
26	Scopus			
27	Thomson Innovation-Patent database			
28	Grammarly -Online spelling checker software			
29	iThenticate- Plagiarism detection tool Software			

At present the 8000+ number of journals full text accessible through IP based network of NKRC platform to meet the research demands of the respective nodal R&D research laboratories.

5. CSIR-National Geophysical Research Institute (NGRI) at Glance

The CSIR-NGRI was established in the year 1961 with the mission to carry out basic and applied research encompassing the broad disciplines of Geology, Geophysics and Geochemistry. Over the last 60 years, the institute has evolved into a Centre of Excellence with multidisciplinary Earth Science research programs that are in tune with the mission of the CSIR and frontier global challenges. Presently, the Institute's R & D programs are focused in the following areas:

- Deep Earth Structure and Process
- Exploration of Hydrocarbon
- Geochemistry, Geochronology, Mineral and Groundwater
- Earthquake Hazards
- Theoretical Geophysics& Engineering Geophysics

National Geophysical Research Institute's library was established in October 1961 as the continuation of the library of Central Board of Geophysics, Calcutta which existed since the late 1940s. The Special Library and Information Centres of CSIR Libraries were renamed as Knowledge Resource Centres (KRC) it's an integral part, that contributes towards the development of R&D activities in their respective subject areas. CSIR-NGRI Libraryis renamed as "Hari Narain Knowledge Resource Centre" (H.N.K.R.C.) in the memory of Dr Hari Narain, former Director, CSIR-NGRI.

HNKRC is a Special Science Reference Library mainly meant for the use of its research staff, i.e. scientists, technical and research scholars of the institute. It is also frequently used by the faculty members and research scholars of other institutes and universities working with the related subject domain. The HNKRC has its digital library to provide access to the scientific literature from various major publishers to enhance and quick exchange of data sharing within the community.

5.2 Resources available in CSIR-NGRI Library

The CSIR-NGRI Library is the most comprehensive and unique collection of Earth Sciences Resources within the country reflecting the history of the Institute in its collection. At present the collection has books/e-books and Journals/e-journals

covering as all the disciplines of Solid Earth Science System Geophysics, Geology, Geochemistry, Geochronology.

Collection available of CSIR-NGRI Library (as on 03-03-2020)

Books	**20620**
Back Volumes / Archival Collection	**17822**
Subscription to Print Journals	**15**
Subscription to E-Journals	**120**
CD-ROM Collections	**200**
PhD Thesis	**113**
Technical Reports of CSIR-NGRI	**225**

E-Resources Subscription by CSIR-NGRI Library:

NGRI is having the Individual e-subscription of Earth and Planetary Science collection of all global major publishers. The 100 % of payment made by CSIR-NGRI on yearly subscription/renewal based suggested by the Library Committee. The following are the publisher's e-journals are having the access form current issue to back volumes as shown in Table 3.

Table 3

Sl.	Name of the Publisher	No. of Journals subscription	Access Period
1	Elsevier -ScienceDirect (Earth & Planetary Science collection)	20	Current to All Archival
2	Wiley-Blackwell (AGU+EAGE)	17	Current to All Archival
3	Geo Science World	47	Current to All Archival
4	Geological Society of America, U.S.A	4	Current to All Archival
5	Geological Society London, UK Lyell Collection complete – E Journals	7	Current to All Archival
6	Geological Society of London Special Publications	480 volumes	
7	Geological Society of LondonHistoric content	3	1811-1963
8	Seismological Society of America, U.S.A	2	Current to All Archival
9	Oxford University Press, U.K.	2	Current to All Archival

10	Cambridge University Press	1	Current to All Archival
11	Mineralogical Society of Canada	1	Current to All Archival
12	Society of Economic Geologists, U.S.A	1	Current to All Archival
13	Annual Reviews	1	Current to All Archival
14	A.A.P.G., U.S.A.	3	Current to All Archival
15	Canadian Science Publishing	1	Current to All Archival
16	Society of Exploration Geophysicists SEG.(U.S.A.)	8	Current to All Archival
17	University of Chicago Press, U.S.A.	1	Current to All Archival
18	Wadia inst. Of Himalayan Geology, Dehradun (Print Only)	1	Current to All Archival
19	Geological Society of India, Bangalore	1	Current to All Archival
20	Geological Survey of India, Kolkata	1	Current to All Archival
21	Indian Academy of Sciences, Bangalore	2	Current to All Archival
22	Indian Geophysical Union, Hyderabad	1	Current to All Archival
	Databases and Software's		
23	iThenticate Plagiarism Software		
24	Grammarly- A Online spelling checker		
25	RemoreXs- Remote login facility at off-campus		

Apart from this CSIR-NGRI has a Nodal Institute member of CSIR-NKRC, the institute get the IP based access of NKRC resources by paying the partial percentage of payment under the lab contribution to NKRC. The following e-resources are having the access to CSIR-NGRI through NKRC shown in Table 4.

Table 4

Sl.	Name of the Publisher	No. of Journals subscription	Access Period
1	Springer Journals		Current to All Archival
	Earth and Environmental Science	138	
	Chemistry and Materials Science	163	
2	Nature Publishing Group	2	Current to All Archival
3	Web of Science database		
	Access from NKRC Consortia (IP based)		
1	Emerald journals	150	2012 to Present

2	Oxford university Press Journals	49	
3	Royal Society of Chemistry	34	2013 to Present
4	Taylor & Francis	430	1997 to Present
5	Wiley-Blackwell	253	Current to All Archival
6	IEEE	663	Current to All Archival
7	J-Gate plus through Login		
8	ASTM standard through Login		

6. Conclusion:

E-resources are the strength for research and academic activities and help in faster access and retrieval of information in various disciplines. National Knowledge Resource consortium (NKRC) is an e-journal consortium facilitating 24 × 7 online access of all major science and technology journals to all the 39CSIR and 26 DST Scientific research community through IP authentication.It is a single platform that stands as the backbone for knowledge resources sharing for all the laboratories.

The study discussed about the consortia needs, benefits and different models of consortiums and focused on CSIR-NKRC e-journal Consortium to find out the available e-resources of the consortium and observed the Lab contribution of CSIR-NGRI as a nodal institute of CSIR-NKRC. It is observed that NKRC consortia model (e-only) is alwayscost-effective for individual laboratories, within minimum cost they can getmoreaccess potentiality from the consortia platform. In this view Libraries in India, Academic and R&D Institutes should have a vison to establish their own group of consortium to work cooperatively in order to share their electronic resources to save themselves from financial crunch due to day by day increasing price of e-journals. CSIR-NKRC is a centre of art which is playing acrucialrole in the research anddevelopmental activities in Science and Technology in the country.

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Awareness and Utilisation of "Web 2.0 To 4.0 Tools" Among the Students and Research Scholars of Yogi Vemana University, Kadapa, Andhra Pradesh

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Abstract: The advent of Web innovations and technologies made the Web as a great platform for Higher Learning and Research. Sitting somewhere and accessing the content from anywhere is a dream during the 1980's. Today the Web has grown like a Universe of interlinked web pages that contains Audio, Video, and Interactive content in addition to text and images. Existing web technologies and browsers make Web as a huge network of websites with vast content spread over millions of machines throughout the globe. Since Collaboration and Sharing of views and information plays a vital role in Higher learning, present Web tools like Learning Management Systems (LMS), Blogs, Wikis, Instant messaging (i.e. WhatsApp, Google hangouts, telegram & skype), Podcasting, RSS (Really Simple Syndication) feeds, cloud storage, Google docs, Social book marking (Delicious, dig & StumbleUpon), Social networks (Facebook, Twitter, Google +, LinkedIn) have enormous increase in adaptation. During the starting period of Web, when Tim Berners-Lee launched the concept of Web, the technical community called it as Read only Web. Now the scenario has been changed a lot with innovations related to web services. The present study is conducted to know the awareness and utilisation of Web 2.0 to 4.0 tools among the students and research scholars. It is clear from the study that most of the respondents are aware of and utilising Web 2.0 tools. The utilisation is less on Web 3.0 -4.0 tools among the students and scholars. The University has to conduct more number of awareness programs on how to utilise Web 3.0 and 4.0 tools for the benefit of the students.

Keywords: Awareness, Utilisation, Web 2.0 to 4.0 Tools, ICT, Yogi Vemana University.

1. Introduction

A Web is referred to as a collection of website and web services. It is constantly evolving by incorporating new technologies thereby increasing the services provided by the Web. When compared with the web, the Internet is treated as a hardware platform with network of networks connected throughout the globe, whereas Web is software with a collection of websites with vast content. Web 1.0 (Read-only Web**)** also referred to as a Content Delivery Network (CDN). It consists of Static websites intending to present the content to potential users, like a catalogue or a brochure. HTTP is a protocol used for communication. Open

mark-up language HTML is used widely to develop the websites. Britannica Online is a popular service from Web 1.0. Web 2.0 (Read and Write Web) also called as a participative social web. The major drawback of Web1.0 is lack of interaction facility for users. Ajax and JavaScript became the major web technologies used in Web 2.0 to facilitate communication among the users. Web 2.0 made Publishing and sharing the content just with few clicks. Web 3.0 (Read, Write and Execute Web) also referred to as Semantic Web, not only reading and publishing the content, execution is also made a web service with Web 3.0. Presenting the required content to the users is a major aim of Web 3.0 with different searching mechanisms like Contextual search, Tailor-made search, and personalized search. The applications of Web 3.0 are called Smart applications. Web 4.0 (Read, Write, Execute and Concurrency Web) is still under development, and there is no exact definition of it. This Web aims to facilitate interaction between humans and machines. Also making machines intelligent in taking decisions based on present context. Web OS is another objective of Web 4.0 acts as middleware and works parallel to the human brain. This Web is moving towards like an Intelligent Web.

2. Brief Profile of Dr. Apj Abdul Kalam Central Library

Yogi Vemana University is premier state university dedicated to teaching, research and service and came to existence by an act of the Government of Andhra Pradesh in 9th March 2006. The main campus is located 15 km away from Kadapa city of the Kadapa-Pulivendual Road. Prior to this, it was Sri Venkateswara Univesity P.G centre, Tirupati for more than two and a half decades. The University has 652 acres of land for its main campus with required infrastructural facilities. Yogi Vemana University is semi-residential in character. It has the potential to attain phenomenal academic growth in the disciplines of Basic and Advanced Science and Technologies, Humanities and Social Sciences in the year to come.

The library was established in the erstwhile, (Sri Venkateswara Univesity, Tirupati) P.G centre, in the year 1977 with a collection of 27857 books. After elevation of its status as a full-fledged university, the library received greater attention. Till 2012 it was functioning in sheds with sufficient amenities. On October 2015, to commemorate the birth anniversary of Bharat Ratna Dr. A.P.J. Kalam, and as a befitting tribute to the inspirational scientist and humanist, the library has been named after him. It is hoped that like Dr. A.P.J. Abdul Kalam, the library will be a beacon light for creative, spiritual, scientific and artistic pursuits. The library has an automated using SOUL (Software of University Libraries). The library has following print and online collection to meet the user's needs in the University.

Sl.No	Type of collection	Total no's
	Textbooks	50276
	Periodicals	92
	Theses	152
	Back volumes	382
	Dailies	13
	E-Journals	06

3. Objectives

- To know the awareness and utilisation of web 2.0 to 4.0 tools used by the students of Post-Graduate and Research Scholars for exploring relevant information
- To know the frequency of using web 2.0 to 4.0 web tools used by the students and Research Scholars.
- To find out the purpose and utilization of web 2.0 to 4.0 tools used by the students and Research Scholars.
- To know the most preferred Web tool of students and scholars

4. Scope of the Study

The present study is limited to know the Awareness and utilisation of Web 2.0 to 4.0 tools among the Students and research scholars of Yogi Vemana University, Kadapa, Y.S.R District, and Andhra Pradesh. Investigators have selected final year Post Graduation students and Research Scholars who have visited the university library.

5. Methodology

The present study is mainly based on the primary data collection apart from that the researcher has been designed a standard and simple questionnaire to distribute. The simple random sampling method has been used for the user survey to get opinions from the target group and all the students are replied for the questionnaire and presented the same data in this survey. 120 questionnaires were distributed and 107 questionnaires were received.

6. Data Analysis and Interpretation

Table 1.1 Gender wise distribution of respondents

Gender	No. of respondents	Percentage (%)
Male	64	59.8%
Female	43	40.2%
Total	107	100%

It is evident from table-1.1 that 64 (59.8%) are male and the remaining 43 (40.2%) are female. Hence, it can be concluded that majority of the response are male respondents.

Table 1.2 Category wise distribution of respondents

Users	No. of respondents	Percentage (%)
Post Graduate students	62	57.9%
Research Scholars	45	42.1%
Total	107	100%

Table-1.2 shows that 62 (57.9%) are post graduate students and 45 (42.1%) are research scholars.

Table 1.3 Location to access Web tools

Location	No. of respondents	Percentage (%)
Home	25	26.75%
University Library	37	39.59%
University Wi-Fi	51	54.57%
Department	22	23.54%
Cyber cafe	5	5.35%

Table - 3 indicated that most of the respondents are using University Wi-Fi and 37 (39.59%) are using university library to access Web tools

Table 1.4 Type of electronic device to access Web tools

Electronic Device	No. of respondents	Percentage (%)
Desktop at the University library	29	31.03%
Desktop at home	16	17.12%
Personal computer	19	20.33%
Laptop / tablet	47	50.29%
Smart phones	93	99.51%

It is evident from table1.4 that 93(99.51%) are using smart phone, 47(50.29%) laptop, 29(31.03%) desktop at the university library and only 16(17.12%) are using desktop at home to access Web tools. This shows that smart phones are gaining popularity day by day.

Table 1.5. Satisfaction level regarding the speed of Internet access

Speed of Access	Satisfaction level			
	Highly satisfied	Satisfied	Average	Dissatisfied
University	29 (31.03%)	31 (33.17%)	6 (6.42%)	1 (1.07%)
University Wi Fi	33 (35.31%)	29 (31.03%)	10 (10.7%)	4 (4.28%)
Home connection	18 (19.26%)	11 (11.77%)	9 (9.63%)	1 (1.07%)
Free Wi Fi	20 (21.4%)	19 (20.33%)	16 (17.12%)	1 (1.07%)
3G/4G service	47 (50.29%)	38 (40.66%)	6 (6.42%)	21 (2.14%)

It is observed that 47(50.29%) are highly satisfied with the speed of 3G/4G services followed by university wifi, 33(35.31%).

Table 1.6 Awareness and Utilisation of Web tools

Popular Web tools	No. of respondents	Percentage
Blogs	47	50.29%
Wikis	57	60.99%
Instant messaging IM (i.e.WhatsApp, Google hangouts, Telegram & Skype),	83	88.81%
Podcast,	34	36.38%
RSS Feeds	28	29.96%
Cloud storage	55	58.85%
GoogleDocs	52	55.64%
Social book marking (Delicious, Digg & StumbleUpon),	1	1.07%
Social networks *(*Facebook, Twitter, Google +, LinkedIn)	81	86.67%
Media sharing	80	85.6%
Virtual world	30	32.1%
3D graphics	6	6.42%
Virtual Assistants (i.e. Google Assistant, Amazon Alexa & Siri)	11	11.77%

It is found that the majority of the respondents 83(88.81%) are using instant messaging followed by 81(86.67%) using social networks, 80(85.6%) using media sharing.

Table 1.7 Purpose of using Web tools

Purpose	No. of respondents	Percentage
To create and share documents, pictures and videos	43	46.01%
For following famous people, artists, sports, etc	24	25.68%
Study and Research	80	85.6%
General Knowledge	37	39.59%
Entertainment	28	29.96%
Job opportunities	36	38.52%

It shows that majority 80 (85.6%) of the respondents stated that their purpose of using web tools for study and research, 43 (46.01%) are using to create and share documents and 37(39.59%) are using for general knowledge.

Table 1.8 Frequency of using Web tools

Frequency	Daily	Weekly	Once a month	Once a year	Never
Blogs	21 (22.47%)	25(26.75%)	12(12.84%)	6 (6.42%)	43 (46.01%)
Wikis	32 (34.24%)	23(24.61%)	12(12.84%)	3 (3.21%)	37 (39.59%)
Instant messaging	65(69.55%)	14(14.98%)	6(6.42%)	1 (1.07%)	21 (22.47%)
Podcast,	15(16.05%)	14(14.98%)	14(14.98%)	3 (3.21%)	61 (65.27%)
RSS Feeds	9(9.63%)	17(18.19%)	10(10.7%)	6 (6.42%)	65 (69.55%)
Cloud storage	24(25.68%)	16(17.12%)	19(20.33%)	5 (5.35%)	43 (46.01%)
GoogleDocs	34(36.38%)	17(18.19%)	19(20.33%)	4 (4.28%)	33 (35.31%)
Social book marking	23(24.61%)	20(21.4%)	9(9.63%)	6 (6.42%)	49 (52.43%)
Social networks	63(67.41%)	23(24.61%)	8(8.56%)	1 (1.07%)	12 (12.84%)
Media sharing	58(62.06%)	22(23.54%)	6(6.42%)	4 (4.28%)	17 (18.19%)
Virtual world	7 (7.49%)	11(11.77%)	10 (10.7%)	3 (3.21%)	77 (82.39%)
3D graphics	1(1.07%)	1(1.07%)	2 (2.14%)	2 (2.14%)	101(108.07%)
Virtual Assistants	3(3.21%)	4 (4.28%)	2 (2.14%)	2 (2.14%)	96(102.72%)

Respondents were asked about frequency of using web tools. It shows that majority of the respondents are using daily 65(69.55%) are using Instant messaging, 63(67.41%) are using social networks, 58(62.06%) are using media sharing. It is observed that less number of respondents is using web 3.0 and 4.0 tools

Table 1.9 Preference level of using Web tools

Preference level	High	Average	Low
Blogs	22 (23.54%)	29 (31.03%)	56 (59.92%)
Wikis	27 (28.89%)	43 (46.01%)	37 (39.59%)
Instant messaging	35 (37.45%)	41 (43.87%)	31 (33.17%)
Podcast,	12 (12.84%)	29 (31.03%)	66 (70.62%)
RSS Feeds	13 (13.91%)	23 (24.61%)	71 (75.97%)
Cloud storage	24 (25.68%)	35 (37.45%)	48 (51.36%)
GoogleDocs	26 (27.82%)	34 (36.38%)	47 (50.29%)
Social book marking	21 (22.47%)	24 (25.68%)	62 (66.34%)
Social networks	44 (47.08%)	38 (40.66%)	25 (26.75%)
Media sharing	36 (38.52%)	43 (46.01%)	28 (29.96%)
Virtual world	13 (13.91%)	17 (18.19%)	77 (82.39%)
3D graphics	2 (2.14%)	4 (4.28%)	101 (108.07%)
Virtual Assistants	5 (5.35%)	6 (6.42%)	96 (102.72)

It is evident from the above table 1.9 that the 44(47.08%) of respondents are using social networks, 36(38.52%) are using media sharing, 27(23.54%) and 22(23.54%) are using wikis and blogs. Less preference is given to web 3.0 and 4.0 tools

Table 1.10 Time spent on using Web tools

Frequency of time	Hours per week				Not used
	30minutes	1-2	2-4	≥6	
Blogs	27(28.89%)	27(28.89%)	11(11.77%)	11(11.77%)	31(33.17%)
Wikis	21(22.47%)	28(29.96%)	7 (7.49%)	10 (10.7%)	41(43.87%)
Instant messaging	20 (21.4%)	25(26.75%)	19(20.33%)	12 (12.84%)	31(33.17%)
Podcast,	22(23.54%)	18(19.26%)	7 (7.49%)	6 (6.42%)	54(57.78%)
RSS Feeds	23(24.61%)	15(16.05%)	6 (6.42%)	6 (6.42%)	57(60.99%)
Cloud storage	28(29.96%)	14(14.98%)	16(17.12%)	6 (6.42%)	43(46.01%)

Google Docs	20 (21.4%)	18(19.26%)	15(16.05%)	6 (6.42%)	48(51.36%)
Social book marking	19(20.33%)	22(23.54%)	14(14.98%)	4 (4.28%)	48(51.36%)
Social networks	21(22.47%)	40 (42.8%)	25(26.75%)	12 (12.84%)	9(9.63%)
Media sharing	30 (32.1%)	38(40.66%)	21(22.47%)	11 (11.77%)	7(7.49%)
Virtual world	12(12.84%)	8 (8.56%)	6 (6.42%)	4 (4.28%)	77(82.39%)
3D graphics	3 (3.21%)	2 (2.14%)	1 (1.07%)	0 (0%)	101(108.07%)
Virtual Assistants	7 (7.49%)	3 (3.21%)	1 (1.07%)	0 (0%)	96(102.72%)

It is observed that majority of the respondents 40 (42.8%) spend one to two hours in social networks followed by 38 (40.66%) media sharing. 15(16.05%) and 14 (14.98%) are using RSS Feeds and cloud storage.

Table 1.11 Use pattern of Web tools

Web Tools	Very easy	Easy	Difficult	Very Difficult	Not used
Blogs	21(22.47%)	33(35.31%)	14 (14.98%)	1 (1.07%)	38(40.66%)
Wikis	27(28.89%)	38 (40.66%)	12 (12.84%)	1 (1.07%)	29 (31.03 %)
Instant messaging	45(48.15%)	35 (37.45%)	4 (4.28%)	0 (0%)	23 (24.61%)
Podcast,	16(17.12%)	28 (29.96%)	21 (22.47%)	3 (3.21%)	39 (41.73%)
RSS Feeds	14(14.98%)	21 (22.47%)	21 (22.47%)	2 (2.14%)	49 (52.43%)
Cloud storage	20 (21.4%)	25 (26.75%)	24 (25.68%)	1 (1.07%)	37 (39.59%)
GoogleDocs	20 (21.4%)	34 (36.38%)	19 (20.33%)	2 (2.14%)	32(34.24%)
Social book marking	23(24.61%)	26 (27.82%)	10 (10.7%)	3 (3.21%)	45(48.15%)
Social networks	52(55.64%)	38 (40.66%)	5 (5.35%)	1 (1.07%)	11(11.77%)
Media sharing	47(50.29%)	36 (38.52%)	5 (5.35%)	0 (0%)	19 (20.33%)
Virtual world	10 (10.7%)	15 (16.05%)	4 (4.28%)	1(1.07%)	77(82.39%)
3D graphics	2 (2.14%)	2 (2.14%)	1 (1.07%)	1(1.07%)	101(108.07%)
Virtual Assistants	6 (6.42%)	3 (3.21%)	1 (1.07%)	1(1.07%)	96(102.72%)

It shows that majority 52 (55.64%) of the respondents stated that it is very easy to use web tools like social networks. Less number of respondents stated that it is difficult to use Web tools.

7. Major Findings

- 64 (59.8%) are male and the remaining 43 (40.2%) are female
- 62 (57.9%) are post graduate students and 45 (42.1%) are research scholars
- Most of the respondents are using University Wi-Fi and 37 (39.59%) are using university library to access Web tools
- 47(50.29%) are highly satisfied with the speed of 3G/4G services followed by university wifi, 33(35.31%).
- Majority of the respondents 83(88.81%) are using instant messaging followed by 81(86.67%) using social networks, 80(85.6%) using media sharing
- 44(47.08%) of respondents are using social networks, 36(38.52%) are using media sharing, 27(23.54%) and 22(23.54%) are using wikis and blogs.
- 40 (42.8%) spend one hour on social networks followed by 38 (40.66%) media sharing. 15(16.05%) and 14 (14.98%) are using RSS Feeds and cloud storage.
- 52 (55.64%) of the respondents stated that it is very easy to use web tools for social networks. Less number of respondents stated that it is difficult to use Web tools

8. Suggestions

- Need to create awareness among the students and research scholars on Web 3.0 and Web 4.0 tools as less number of students are using those tools
- Need to conduct workshops and seminars on the privacy and security on Social networks as majority of the respondents are using
- Teachers need to encourage the students and scholars to create blogs as writing skills are increased to maintain blogs which are helpful in their study and research

9. Conclusion

It is clear from the study that most of respondents are aware of web 2.0 tools of instant messaging, social networks and media sharing for different purposes such as study and research , to share documents to others and searching for job opportunities etc, It is also found that less number of students are using Web 3.0 and 4.0 tools. The library has to organise more awareness programs on utilising those tools as the library is playing a vital role in the promotion of research in universities.

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Design and Development of Learning Management System by Using Moodle for Library and Information Science Students and Research Scholars of Sant Gadge Baba Amravati University: A Study

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ABSTRACT: E-learning is one of the tools that emerged from information technology and has been integrated into many universities, education programs, shifting from the traditional way of education to electronic environment in which a student can access and make use of information anywhere and at any convenient time. This paper observes the possibilities of applying open source learning management systems (LMS) in the teaching and learning process of Department of Library and Information Science, Sant Gadge Baba Amravati University. This paper discussed with the role of Moodle LMS as a tool in delivering effective teaching and learning.

Keywords: E-learning, Learning Management System, Moodle

1. Introduction

Traditional learning refers to any form of instruction that utilizes classic paper and pencil methods in a regular classroom setting. The information age is making new demands on all. Education must find ways to face the new challenges. There is the need for every child to be educated. The information now resides out there, distributed across a vast network and shared between all peoples. Education is usually perceived as the method whereby students in a classroom receiving lessons from a teacher, but with the help of information technology through the Internet, learning can now be achieved without necessarily having a teacher right in front of a student. E-learning is one of the best ways to enhance the teaching skills of aspiring teachers and helps to boost their motivation up to a great extent. Using a Learning Management System in education to deliver content to students can increase adoption rate, minimize costs and cut down the training time substantially.

2. Sant Gadge Baba Amravati University (Sgbau) : At A Glance

Sant Gadge Baba Amravati University (SGBAU) was established on May 01, 1983 in Amravati, Maharashtra, India. The University has a lush green campus spread

over 470 acres. SGBAU also referred as Amravati University is situated in Vidarbha with its jurisdiction in 5 states of Vidarbha; Amravati, Yavatmal, Akola, Washim and Buldhana. The University in its small span of two decades has contributed in many ways for economic, social & cultural upliftment of the society by offering quality education. The University offers varied graduate, post graduate, doctoral programs through 28 teaching departments with excellent faculty providing quality education and a vibrant environment to the students. The University has been inclined to create necessary infrastructure conducive to the teaching learning. The aim of the university is to provide high quality, comprehensive education learning, research and extension activities those are compatible to the current and forth coming generation. The University has been contributing to the educational sector for ages now and is famous for the quality education it provides.

Universities are striving to find ways to help their students improve their learning and teaching skills both inside & outside of the classroom. E-learning is one of the tools that emerged from information technology and has been integrated into many universities, education programs, shifting from the traditional way of education to electronic environment in which a student can access and make use of information anywhere and at any convenient time. Using a Learning Management System in education to deliver content to students can increase adoption rate, minimize costs and cut down the training time substantially. All these developments are leading to a move in the role of universities as a source of knowledge to create an environment that the students can explore discover and learn by themselves.

Library and Information Professionals always play a crucial role to make the users informed and knowledgeable and to support the teaching, research and institutional programmes.

3. Learning Management System

Learning Management Systems are online platforms where teachers and students can collaborate in order to improve student achievement.

3.1 Types of Learning Management System

LMS vendors competing to offer users the most engaging learning features and functionality fill today's learning technology market. The technology determines whether an LMS offers the functionality needed to reach E-learning goals.

- Closed Source LMS
- Open Source LMS

Closed-source options typically provide an out-of-the-box eLearning platform. They often present limitations on customization and functionality based on what's proprietary to the specific product.

Open-source solutions allow creating an eLearning experience by offering the ability to incorporate additional plugins and third-party solutions, as well as customize the design and course structure based on learner's need.

4. Modular Object-Oriented Dynamic Learning Environment (MOODLE)

Moodle (Modular Object-Oriented Dynamic Learning Environment) is an Open Source e-learning platform. Moodle was created by Martin Dougiamas while working on a postgraduate degree at the Curtin University of Technology in Australia. In 2002, Martin Dougiamas was a Webmaster of a university and a system administrator of WebCT installation.

Moodle is a Course Management System (CMS) - a software package designed to help educators to create quality online courses. Such e-learning systems are sometimes also called Learning Management Systems (LMS) or Virtual Learning Environments (VLE). Moodle presents an excellent platform for resources and communication tools to run. Moodle must first be installed on the main server; an administrator configures the settings to enable access through user names and passwords. The user access Moodle through the Internet as it is web-based and does not have to install anything locally. It is a learning platform designed to provide educators, administrators and learners with a single robust, secure, and integrated system to create personalized learning environments.

Moodle supports infinite of features out of 21 different types of features which can be found in standard platform. All these features and activities help the students to interact with other students or teachers that can be used to support teaching and learning process. (Table No. 1)

4.1 The key functions of an LMS are

- Manage courses and programs.
- Provide and administer course registration.
- Track student registration, access, and progress.
- Manage to learn administration and reporting.
- Enable financial tracking and control of learning.
- Provide course scheduling and administration.

Table No. 1: Activity and Resources of Moodle E-learning Platform

Interactive Features	Assignments	An activity used to submit files for marking
	Attendance	An activity used to take attendance during sessions
	Custom Certificate	This activity allows for the dynamic generation of PDF certificates
	H5P	This activity enables the creation of a variety of interactive content for formative assessment.
	Lesson	An activity for creating flexible learning paths using a series of HTML pages and choices.
	Quiz	Activity that can automatically provide marks and feedback to participants.
	Checklist	An activity that allows a teacher to create a list
	SCORM Package	Allows uploading of a standard package of interactive content
	Group Choice	Allows students to select one or more groups they wish to be a member of in a course
	Database	An activity which allows students and editors to input and store searchable data
	External Tool	An activity that links to an external source of learning resources and activities, such as a website
	Feedback	An activity that enables the creation of custom surveys to collect feedback.
	Big Blue Button	allows participants to join the conferences with their webcams and invite guest speakers
	Chat	An asynchronous chat tool activity that can be used for group work.
	Forum	Allows students to have asynchronous discussion
	Glossary	A list of definitions that can be added to by student or editor
	Survey	An activity that can use to assess and stimulate learning
	Wiki	A series of web pages that can be edited by participants and automatically links entries
	Workshop	An activity that allows uploading of assignments and facilitates peer and self-assessment

Resources	Book	A multi-page resource with a book-like format that you can page through or navigate using a table of contents
	File	Allows to upload a text, image, audio/video file
	Folder	Allow to create folder to organize files
	IMS Content Package	Allows to add static material from other sources in compatible IMS content package format
	Label	It can be used to add text, images, multimedia or code in between other resources in the different sections
	Page	Allows teachers to create HTML pages for the students
	URL	Link to an external website

Source: www.moodle.org

4.2 Technical Requirement for Moodle

- Server Requirement

  Moodle is primarily developed in Linux using Apache, PostgreSQL/MYSQL/ MariaDB and PHP (called as the LAMP platform), but it works on Windows Vista/7/8/10/2008/ 2012

  Microsoft Visual C++ 2015 Redistributable package is required for PHP

  PHP version: PHP 7.2.x, 7.3.x and 7.4.x

  PHP extension intl is required

- Software Requirement

  256 MB RAM (minimum), 1GB RAM (recommended)

  500 MB free Fixed Disk (more space will be needed depending on user uploads)

- Hardware Requirement

  Disk space: 200MB for the Moodle code, plus as much as you need to store content. 5GB is probably a realistic minimum.

  Processor: 1GHz (min), 2GHz dual-core, or more recommended.

  Memory: 512MB (min), 1GB or more is recommended. 8GB plus is likely on a large production server

5. AIMS and Objectives of the Study

1. To provide interactive instructional environment to students.
2. To enhance the learning opportunities of students in both conventional and online education.
3. To develop learning management system using Moodle platform.
4. To provide the course content for the MLISC Students, Research Scholars of Sant Gadge Baba Amravati University.

5. Scope of the Study

The study is confined only to LIS Professionals, Research Scholar and Master of Library and Information Students studying in colleges affiliated to the Sant Gadge Baba Amravati University.

6. Methodology

The paper observes the possibilities of applying Open source software in the teaching and learning process in the Department of Library and Information Science, Sant Gadge Baba Amravati University. Moodle was downloaded and installed in a local server. Home page of Moodle LMS has been customized and personalized. The course contents of BLISc, MLISc have been created and students of BLISc and MLISc have also been enrolled. E-course Contents available on this website have been developed by subject experts of the respective disciplines. Furthermore, E-courses would be conducted for the research scholars and LIS professionals to delivered effective teaching and innovative learning.

7.1 Moodle@ DLISc, SGBAU, Amravati

Moodle e-learning platform is developed and adopted by the Department of Library and Information Science, Sant Gadge Baba Amravati University to help the course teachers to create quality online courses, in that way managing the learning outcomes of students. Students can access and participate in the course with the help of availability of electronic resources. Moodle@DLISc offers many features like, chat, wiki, forums, feedback, survey, quiz, lessons, Blog (shown on table no. 1) that can be used in the teaching and learning process.

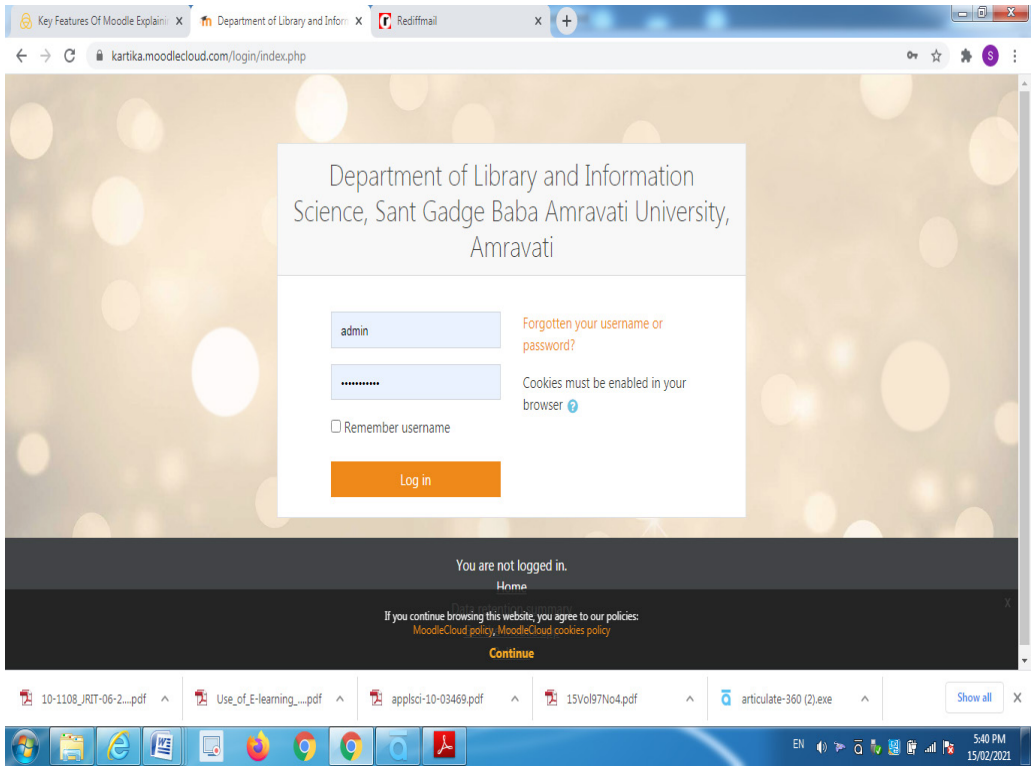


Fig 1: Home page of DLISc@Moodle

7.2 Create Categories and Courses

Moodle@DLISc can be accessed by providing user ID and Password. After applying login ID and Password the user will be moved from home page of the website. A course creator or administrator can put all courses in the miscellaneous category.

- Adding course Categories:
- Click on Site administration & then courses, Manage Courses
- Add a category. Put all required information and click on create new category
- Save the changes after choosing alternative.

Moodle has various options for course formats like SCORM (Sharable Content Object Reference Model), Social format, topic format and weekly format. Since the Department of Library and Information Science have BLISc and MLISc have been created. In addition, Digital Library and Reference Management tool has also been created. Each course category has sub-categories according to their syllabus.

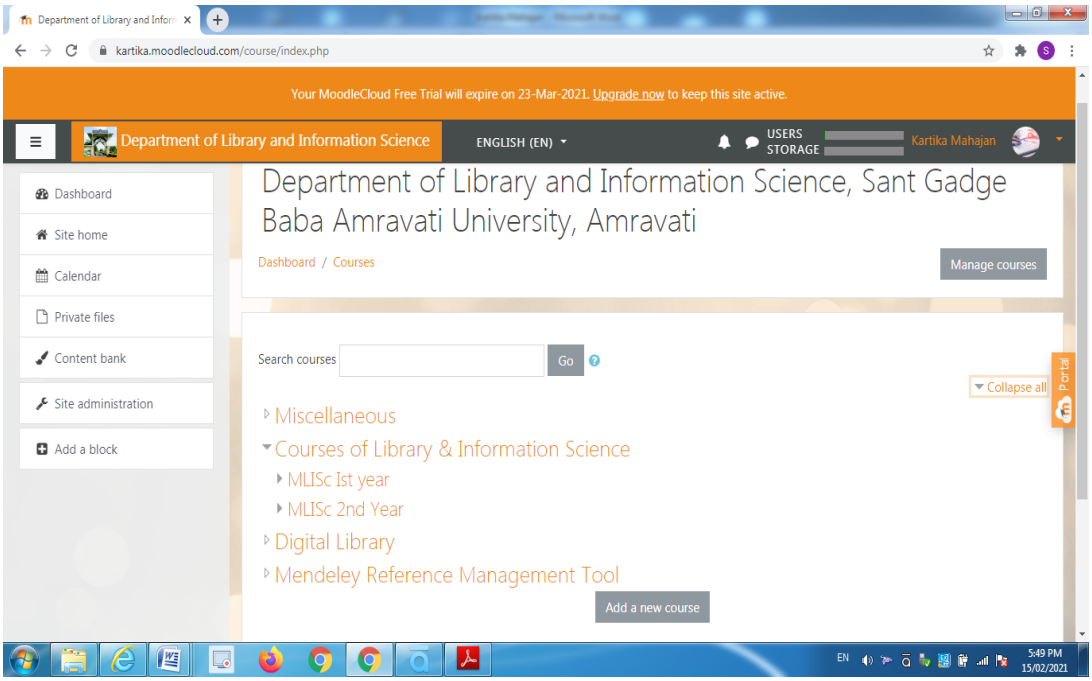


Fig 2: Create Categories of courses

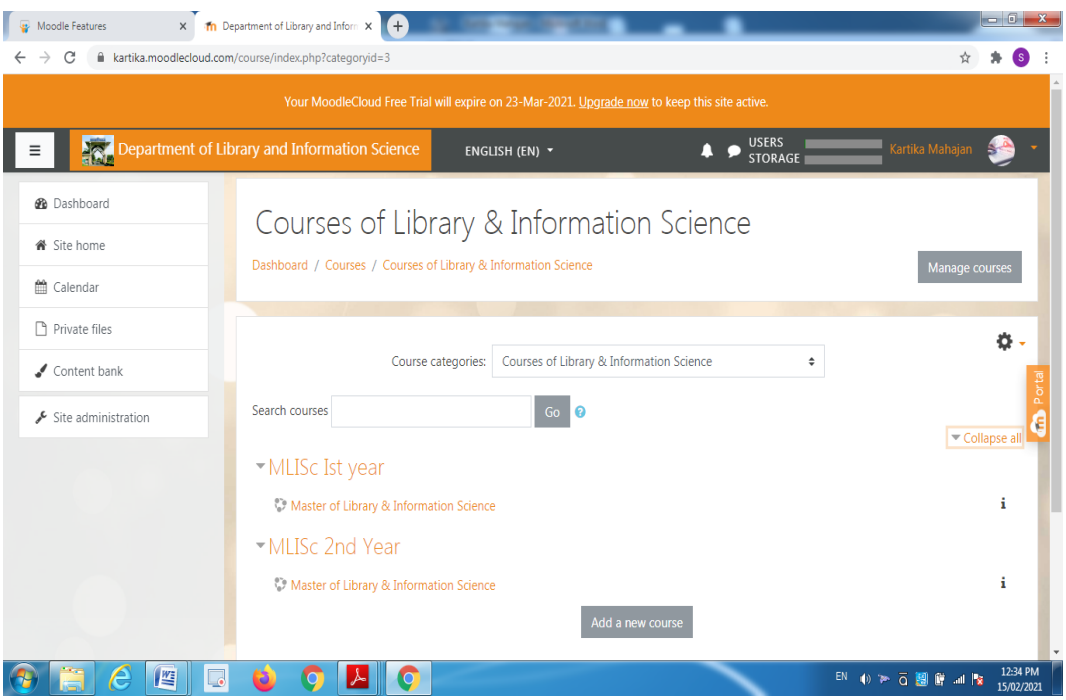


Fig 3: Add Subcategory of the course content

7.3 Integration of E-course/training via SCORM

SCORM is a specific way of constructing Learning Management Systems (LMSs) and training content so that they work well with other SCORM conformant systems. SCORM is all about creating units of online training material that can be shared across systems. Courses of Information Literacy, Digital Library and Mendeley: A Reference management tool would also be integrated through SCORM that enables effective and efficient online training.

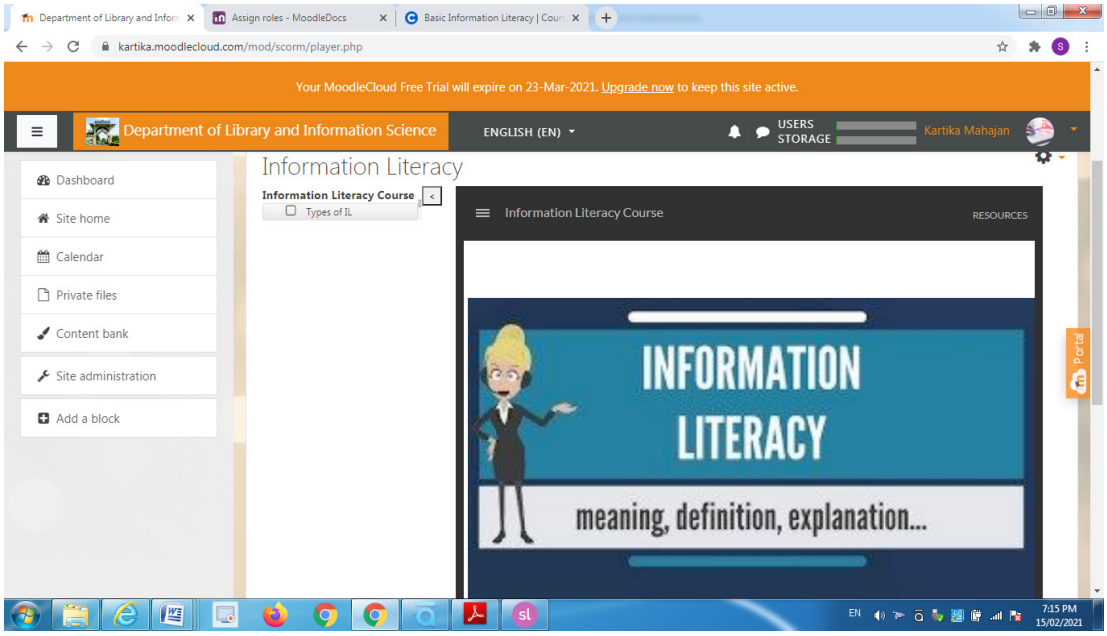


Fig 4: Integration of E-course with SCORM package

7.4 Accessing Moodle@DLISc:

The compatible and user friendly Moodle has been designed for easy access to students of Sant Gadge Baba Amravati University. Easy access of Moodle will enhance the e-learning in an effective way.

7. Conclusion

By applying this E-learning platform, the quality of teaching and level of student achievement will be improved. In fact, Moodle is an effective tool that enables the teachers to organize, manage and deliver learning materials to students. The implementation of Moodle in the Department of Library and Information Science is a prototypical framework, which will be implemented for all departments of

Sant Gadge Baba Amravati University. Further, E-courses would be conducted for the research scholars and LIS professionals to delivered effective teaching and innovative learning.

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Effective use of Digital Resources: Case study of D J Academy for Managerial Excellence, Coimbatore, Tamilnadu: A Study

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Abstract: Digital Resources are those resources whose deals with digital and digitized materials which can be either accessible from libraries in house database or from World Wide Web, the born digital materials includes digital books, e-journals, e-magazines, e-newspapers, e-thesis etc. and other related materials which can be considered necessary by the user, researcher, informational professional, or even by the library management itself. The degree of acceptance and pattern of use of such materials is a great interest to library collection development. It is important that the library has an informed perspective on how Digital Resources are used and valued by the user community regarding their awareness and use of these electronic materials. The objectives of the study were to determine users knowledge of digital resources; and purpose of use of digital resources, both number and frequency; and the areas of training needed. The questions covered computer literacy, computer access and location, knowledge and use of digital resources, and training needs.

Keywords: Digital Resources, Electronic Resources, User study, Survey,

1. Introduction

The utilization of information and communication technology has become an indicator of the level a nation's wealth. The libraries are switching over to ICT based resources and services at an accelerated pace. E – Journals, e- Books, CD-ROM databases, online databases, web based resources and a variety of other electronic resources are fast replacing the traditional resources of libraries. IT is generally defined as the technology that deals with the collection, storage, processing, dissemination and use of information.

Academic libraries have been early adopters of electronic resources to provide information and services. They need not come physically to the library to use print formats but can stay at their place and access online library resources and services

via networks or authentication methods at any time. Users often prefer increased access to databases of online refereed journals and to the Web which provides information that is up to the minute, international in scope, and sometimes not available elsewhere because they see these resources as easier to access and search. Availability of e-resources has changed what users actually read and use. They now tend to use only what is easily accessible. Therefore, they visit the library a lot less, and, as such, discovery through serendipity is reduced. Access to e-resources has decreased the time spent searching for information. The library plays a leading role in user relationships and in instructional services such as orientation and training in use of library resources. If efficient and effective use is to be made of library's e-resources, then user training will have to increase in both intensity and coverage. It is important that the library has an informed perspective on how e-journals are used and valued by the user community regarding their awareness and use of these materials.

Review of Literature

Over the past few years, people's preferences for print and electronic resources have been the focus of numerous studies. Most of these studies were conducted in the academic environment, with particular attention given to surveying students and faculty.

Torma and Vakkari (2004) demonstrated relations between digital library use by university faculty, users' discipline and the availability of key resources in the Finnish National Electronic Library (FinELib), by using nationwide representative survey data. The results showed that the perceived availability was a stronger predictor of the frequency of use of its services than user's discipline. Regardless of discipline, a good perceived provision of central resources led to a more frequent use of FinELib. Similar study from Atilgan and Bayram (2006) reported the results of a survey on the use of e-databases at Ankara University. They surveyed faculty in 2002 to determine the level of awareness of digital library resources, particularly journal articles, along with their usage rate, and to evaluate the preferences of faculty for specific electronic databases. They distributed a questionnaire to researchers at Ankara University. The main findings were that the majority of respondents indicated that they knew that digital library resources available in Ankara University. Many of the faculty members (88 percent) used electronic databases.

Kurata, et al. (2007) in their study was carried out to show the position of electronic journals in scholarly communication based on Japanese researchers' information behavior and estimation. The survey method was questionnaire. The results

showed that Japanese researchers used electronic journals as a matter of course, and other electronic resources to some extent, for accessing information; but that shift to electronic resources seemed to be not a transformation but a modification of traditional patterns of use.

- Gowda and Shivalingaiah (2009) gathered data from researchers of humanities, social science and science disciplines in six universities in Karnataka. Results of the survey shows that in general research scholars prefer print resources and there exist significant differences in the preference of print and e-resources among various disciplines. The discipline wise responses show that the science researchers use the facility most and their counterparts in humanities use least. More than half of the social science disciplines respondents are using the facilities. Full text databases and e-journals are most used resources followed by bibliographic databases and portals.

Another study conducted by Kumbar and Gururaj (2009) indicates that electronic sources of information are highly useful for the research, teaching and learning processes. In order to make it successful and best use of the consortium, authorities of the University Library should conduct regular user education or awareness Programmes to maximize the use of electronic sources of information more effectively and efficiently.

About DJAME Library

The DJAME Library is on its way to becoming an outstanding learning resource Centre catering to the ever growing and uncompromising information and intellectual requirements of the students, faculty, and researchers. The DJAME Library strives for a high quality of library service, which emphasizes the actual delivery of information rather than the actual delivery of documents to meet the generic as well as specific needs of users. It has computerized all its housekeeping activities using Library software that is being maintained and updated regularly, which is connected to campus wide network. This enables users in searching and availing the library resources. Subscribed online databases such as EBSCO, DELNET &NPTEL. It uses the state-of-the-art technology in its functioning and services.

Objectives

The objectives of the study were

(i) To identify the frequency of digital resources.
(ii) To know the preferred type of digital resources.
(iii) To know the availability of digital resources in their subjects.
(iv) To find out the satisfaction level of the digital resources.
(v) The areas of training needed by faculty to utilize digital resources efficiently and effectively and to recommend how the library could fulfill identified training needs;
(vi) What strategies the library could use to improve service as well as what areas the library could research further.

Method of Study

Questionnaire method was used to collect the data for the present study. The questionnaire comprised twenty-nine questions in three sections: (1) access to internet; (2) knowledge and use of electronic resources; (3) training. A Questionnaire was distributed to 150 users of D J Academy for Managerial Excellence. Out of these 130 responded and the response rate is 86.7%. The data were presented in following tables.

Analysis and Interpretation

The data collected through questionnaires, observation and interviews were organized and tabulated, descriptive statistics were employed using SPSS for windows.

Table 1: Frequency of useVs. Respondents

S.No.	Frequency of Use	Respondents
1.	At least Daily	51(61.9)
2.	2 or 3 times a week	32 (63.1)
3.	Once a week	39 (30.0)
4.	Rarely	8 (06.0)

The frequency of access to internet and average time spend on month has been shown in Table 1 and Fig.1. Majority of users were access the internet on 2-3 times in a week followed by daily. There are hardly users who access the internet on rarely basis. It seems that 95% of the respondents were using internet on regular basis.

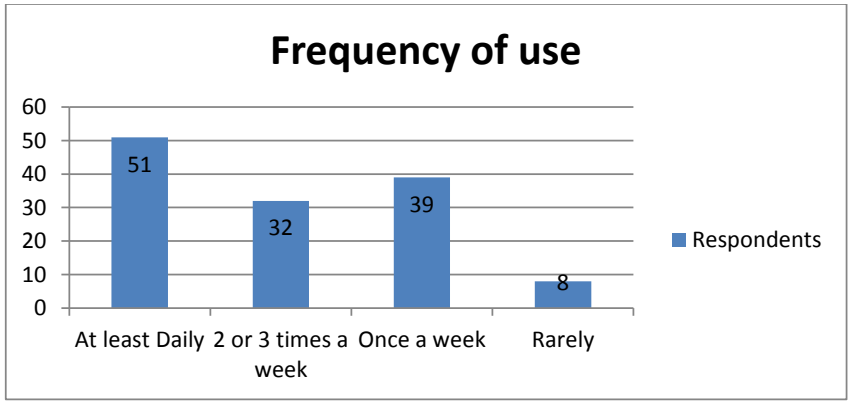


Fig 1. Frequency of use

Table 2: Preferred type of Digital Resources

S.No.	Preferred type of digital resources	Respondents
1.	E-articles/ E-Journals	38 (29.20)
2.	E- books	26(20.00)
3.	E- Newspaper	35(26.90)
4.	Others	31(23.80)

Preferred type of Digital Resources has been identified and shown in Table 2. A result shows that 29.20% of the respondents have preferred electronic journal articles; it is followed by digital newspaper. Only 20% of users were using E-books.

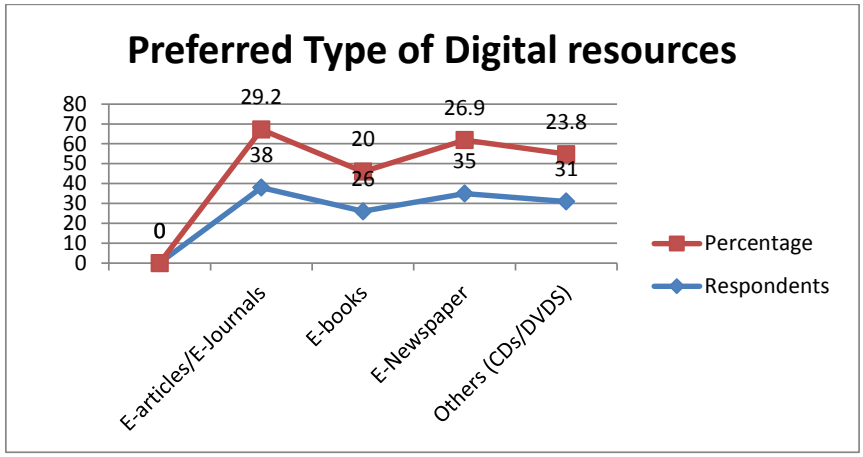


Fig 2. Preferred type of Digital Resources

Table 3: Availability of Digital Resources

It is important to know the adequacy of the available digital resources in the library and to find out to what extent the users feel about the collections.

S.No.	Availability of Digital Resources	Respondents
1.	Available	112 (86.15)
2.	Not Available	18 (13.85)

Table 3 shows the availability of the digital resources in their subjects provided by the library. Most of the respondents are said that Digital resources in the library is covered their subject and their requirements. Few Respondents complain that the digital resources are not covered their subject and internet speed.

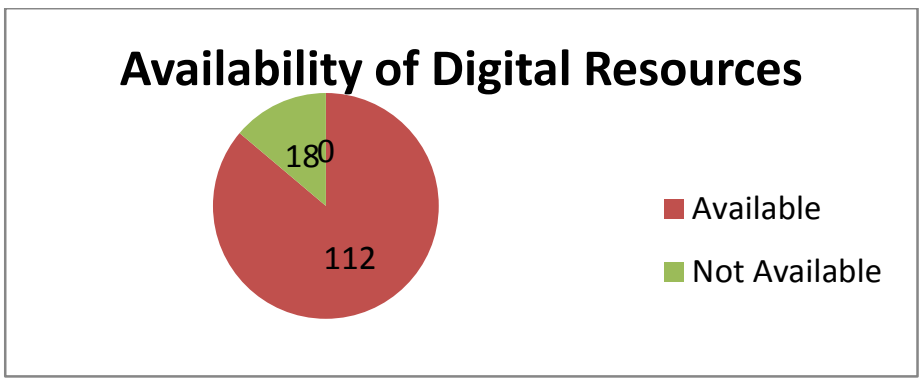


Fig 3. Availability of Digital Resources

Table 4: Satisfaction on Digital Resources

S.No.	Satisfaction on Digital Resources	Respondents
1.	Satisfied	105 (80.77)
2.	Not Satisfied	25 (19.23)

Table 4 and Fig.4 shows the satisfaction of the user with the services provided in the library. Majority (80%) of the respondents are satisfied with available Digital resources in the library. Only 20% of the Respondents complain that the digital resources are not covered their subject and internet speed.

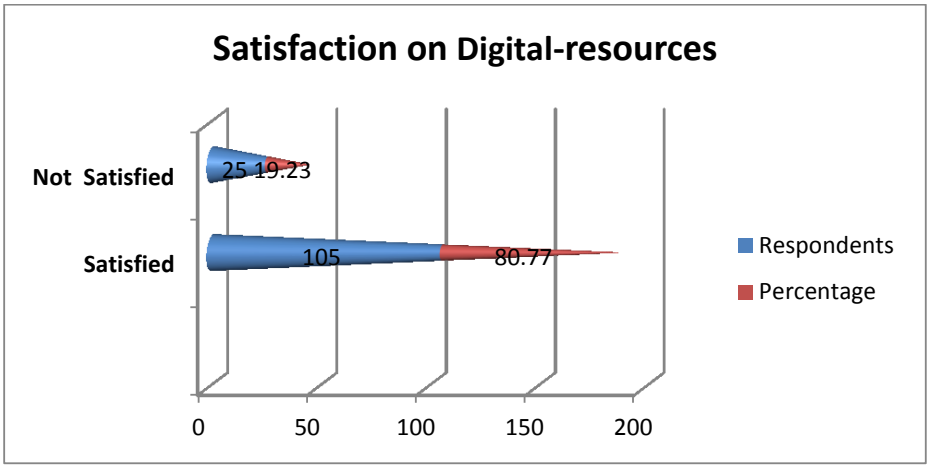


Fig 4. Satisfaction on Digital Resources

Table 5: Training on Digital Resources

S.No.	Training on Digital Resources	Respondents
1.	Short Time Training Programmes are required	39 (44.82)
2.	Awareness Programmes need to be organized	36 (40.90)
3.	Existing library staff must be trained to provide timely assistance	16 (23.18)
4.	Latest information on digital journals must be promptly informed	39 (45.34)

The study attempted to know about the training required for maximum using of digital resources. Most of the respondents required Short time training and awareness Programmes for using digital resources. They said that latest update on e-journals should be informed promptly and library staff should give their assistance.

Suggestions

Based on the findings of the study, the following suggestions are put forward to improve the use of Digital resources.

- More high end computers with high speed internet should be provided
- Some hand on training, orientation programs should be organized frequently by the library
- Digital Resources facility should be made familiar to all.

2. Conclusions

The emergence of internet as a ubiquitous global information and communication resource propelled people's lives into the digital epoch. With the development of the internet and new information technologies, more and more of the educational resources are being produced, distributed and accessed in digital form. The Electronic Resources in the virtual world represent a large investment of people's efforts and wisdom. Digital resources at academic institution is important means and tools to support teaching, learning, and research. The study result shows that the usage of digital resources has great impact on higher education. As the number of digital resources available is good and satisfied the information needs. In spite of positive attitudes towards digital resources, there are some frustrations regarding their use. Lack of computer knowledge, doesn't know how to use and restricted access by publishers.

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Digital Library Software and Services

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Abstract: Emerging technology for digital libraries (DL) can drastically improve the management of resources of libraries. The advantages of having a DL are now well understood by librarians, technologists,and others. Several factors play a major role in digitization of materials for a DL. This paper discusses the transformation of a library from traditional to automated to digitalIf technology push, crashing costs, and global connectivity are the signposts for the coming decade, digital libraries are the next step in the convergence revolution. Digital libraries are innovations, the implementation of which is nascent in the developing countries. However, they hold the promise of becoming key technologies for knowledge creation and management in the future. The purpose of this article is to describe basic concepts, processes and services of digital libraries, discuss challenges and opportunities offered/faced by digital libraries

Keywords: Digital library, Use of Information and Communication Technology in education, Electronic resources, User centered services, Internet Access.

1. Introduction

Digital library is an electronic or virtual library where information (online or offline) is selected, Acquired, processed and organized in digital form. One can access the digital library resources online or offline. Digital Library is a collection of information which is both digitized and organized and can be searched for keywords, accessed anywhere in the world, copied without error, is service-orientated meeting the time and location needs of users and takes up very little physical space (hardware only). With increasing population and industrialization in city area there is always space problem to all educational institutions and libraries. As digital libraries are minimizing the storage space and also decreasing maintenance and resource distribution cost and manpower. The association for Research Libraries pointed out that digital library can serve as a network of links to other digital libraries.A Digital Library will give traditional library a reform that will increase library visits by the users providing their information in digital form at computers. Today DL had improve the library services like electronic journal support service, Electronic

Document Delivery, Electronic Publishing, Resource Service, Inter Library Loan, full text searching, cross-searching specialist abstracting and

Meaning of digital library

A digital library, digital repository, or digital collection, is an online database of digital objects that can include text, still images, audio, video, or other digital media formats. Objects can consist of digitized content like print or photographs, as well as born-digital content like word processor files or social media posts

Digital LibrarySoftware

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2. Digital Library Services

Digital Library Services:

Today we live in a world of instant global communication. Everyone is well known with the technological developments that have come with dazzling rapidity. New techniques for recording and transmitting texts, sound or visual images have proliferated. Digital technology has created prodigious capacities to store, disseminate and retrieve knowledge

1. Online Public Access Catalogue (OPAC)

Now a day's most libraries have online public access catalogues (OPAC) to make users aware of their collections. An OPAC can be used by a members of the library's to search the catalogue database in order to see if the library holds a particular work on a particular subject and be informed of the location of those

works. Library catalogue is perhaps the most important tool for locating material in the Library

2. Reference Service

Lankes defines digital reference as Internet-based question and answer services that connect users with individuals who possess specialized subject or skill expertise. Digital reference services refer to a network of expertise, intermediation and resources put at the disposal of a user seeking answers in an online/networked environment. Asynchronous tools such as e-mail, subject gateways, FAQs, and electronic libraries and interactive tools like chat rooms, virtual reference desk, and ask-me have replaced the conventional means of post, phone or in-person reference enquiries

3 Audio-visual Service

- Audio-visual materials are important sources of information, education and entertainment. Many libraries particularly media libraries and large academic and public libraries hold audio-visual material such as music, films, pictures and photographs, etc.

4. Others services

- Current Awareness Bulletins
- Externally Purchased Databases
- CD-ROM Databases
- Remote Information Services
- Internally Published Newsletters, Reports & Journals
- Electronic Table of Contents
- Electronic Document Delivery Service
- Electronic Theses and Dissertations
- Electronic Publishing
- Tools for loading, storing, searching, and displaying digital objects
- Central storage facilities for Hosting digital collections and indexes

ICT based new library services

Information and Communication Technologies (ICT) have drastically transformed the way of collection, processing, storage, retrieval and communication of information in libraries and information centers. Particularly, the Internet has

completely transformed the traditional method of processing information from collection to communication. It has emerged as the most powerful medium for storage, retrieval and communication of information

1. Internet Access
2. Access to Web-Based Resources

Function of Digital library software

1. Access to large amounts of information to users wherever they are and whenever they need it.
2. Access to primary information sources.Support multimedia content along with text
3. Network accessibility on Intranet and Internet
4. User-friendly interfaceHypertext links for navigationClient-server architect

Advantages of Digital library software

- No Physical Boundary : The user needs not to go to the library physically
- 24/7 access. A major advantage of digital libraries is that people can gain access 24/7 to its information.
- Multiple Access
- Information Retrieval
- Preservation and Conservation
- Space. ... Easily Accessible

Disadvantages of the Digital Librarysoftware's

- **Copyright:** Digitization violates the copy right law as the thought content of one author can be freely transfer by other without his acknowledgement. So One difficulty to overcome for digital libraries is the way to distribute information. How does a digital library distribute information at will while protecting the copyright of the author
- **Speed of access:** As more and more computer are connected to the Internet its speed of access reasonably decreasing. If new technology will not evolve to solve the problem then in near future Internet will be full of error messages

- **Environment:** Digital libraries cannot reproduce the environment of a traditional library. Many people also find reading printed material to be easier than reading material on a computer screen

3. Challenges

Economical:

There is always a cost in its creation, its production, and its dissemination. Digital libraries introduce new and uncertain economic realities and relationships into libraries. Where the costs of accessing information were once hidden to patrons, the digital era is likely to require customers who will be required to pay fees for access to digital services and collections. The major obstacle is digitization. Digitization is very cost intensive. Especially when one goes single handed toward digitization

Administrative:

For building and working with Digital Library the long-term organizational, fiscal, and institutional commitments will be necessary. Management of the technical infrastructure for "digital library" services will be a significant obstacle for most libraries, especially as budgets continue to shrink and the costs of developing and maintaining collections increases. Administration of the digital collections locally, is harder and more expensive than managing a comparable print collection

Technological obsolescence:

The digital storage media such as hard disk, tapes and floppy disk have a very short life–span due to rapid technology obsolescence. The computer hardware and software which used for storage and retrieval become obsolete and they are replaced by batter technologies

Reasons to Use of Digital library Software

The Library Management System Software for Library Management is used to find books and access journals easily. ... The integrated library system is used to manage the more-complex activities and it enables the librarian to manage library resources in a more effective way to save time and effort

Digital library software

There are a number of software packages for use in general digital libraries, for notable ones see Digital library software. Institutional repository software, which focuses primarily on ingest, preservation andaccess of locally produced documents,

particularly locally produced academic outputs, can be found in Institutional repository software. This software may be proprietary, as is the case with the Library of Congress which uses Dig board and CTS to manage digital content

D space

Labs it is a digital asset management system that allows institutions, such as libraries to collect, archive, index, and disseminate the scholarly and intellectual efforts of a Community. Written with a combination of technologies by MIT, it is primarily used to capture bibliographic information Describing articles, papers, theses, and dissertations. DS pace Isadaptable to different community needs. Interoperability between systems is built-in and it adheres to international Standards for metadata format. Being an open source technology platform, DS pace can be customized to extend its

Greenstone

Greenstone Digital Library Software is a project from New Zealand that provides a new way of organizing information and making it available over the Internet. Collections of information comprise large numbers of documents (typically several thousand to several million), and a uniform interface is provided to them. Libraries include many collections, individually organized, though bearing a strong family Resemblance. A configuration file determines the structure of a collection existing collections range from newspaper articles to technical documents, from educational journals to oral history, from visual art to videos, from MIDI pop music Collections to ethnic folksongs.

Eprints

EPrints is free software developed by the "University of Southampton, England". EPrints repository collects preserves and disseminates in digital format the research output created by a research community. It enables the community to deposit their preprints; post prints and other scholarly publications using a web interface, and organizes these publications for Easy retrieval. It is the world's first, most widely used, and by far the most functional of all the available OA IR software

Fedora

Fedora is the underlying architecture for a digital repository, and is not a complete management, indexing, discovery, and delivery application. It is a modular architecture built on the principle that interoperability and extensibility are best achieved by the integration of data, interfaces, and mechanisms (i.e., executable programs) as clearly defined modules.

Alfresco software

1. Alfresco Software Inc. also provides open source Community Editions as free, LGPLv3
2. licensed open source software. These have some default restrictions in terms of scalability and availability, e.g. there is no built-in clustering support.Quality assurance by Alfresco is limited and bug

   Fixes are only issued for the current versions
3. There is a community support for the Community Edition including an independent association, the Order of the Bee

Advantages of Digital library software

- No Physical Boundary : The user needs not to go to the library physically
- 24/7 access. A major advantage of digital libraries is that people can gain access 24/7 to its information.
- Multiple Access

  Information Retrieval

  Preservation and Conservation

  Space. ... Easily Accessible

Dis-advantages of the Digital Library

Copyright

Digitization violates the copy right law as the thought content of one author can be freely transfer by other without his acknowledgement. So One difficulty to overcome for digital libraries is the way to distribute information. How does a digital library distribute information at will while protecting the copyright of the author?

Speed of Access

As more and more computer are connected to the Internet its speed of access reasonably decreasing. If new technology will not evolve to solve the problem then in near future Internet will be full of error messagesEnvironment

Environment: Digital libraries cannot reproduce the environment of a traditional library. Many people also find reading printed material to be easier than reading material on a computer screen

4. Conclusion

Digital libraries software are among most complex existing forms of information systems. Access to information today is simpler and the sources are many. Building effective DL will help people to deal with this situation by guiding them in the process of information search and retrievalGiven that the digital library field is still quite new, it seems strange to be talking already about enhancing digital libraries. However, in this fast-moving environment, the initial digital libraries resulting from digitization projects, or even virtual collections, are being enhanced as user expectations and technology capabilities allow. In the midst of this furious activity, it is valuable to analyze users' needs and interests and then to identify Knowledge Organization System that can be used to enhance the digital library. By going beyond the initial organization of the digital library, digital librarians can use the network environment to provide additional value to its users.

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Theme-3

Reinventing, Re-engineering and Emerging Technology in Libraries

The Smartcity and its Smart Library.

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Abstract: Do libraries helps in setting up smart city? Can the smart city give a new outlook for academic and public libraries? Does the smart city can influence the libraries as scientific and cultural assets? The recent library models, like the green library or the learning center divulge empathy with the idea of the smart city, peculiarly regarding the integration of technology and central role of information and institutions and, people. From this finding, the paper set up new abstraction of the smart library, which can be summarize in four dimensions, i.e., smart assistance, smart individuals, smart site and smart administration. Nevertheless, the smart library concept does not represent a unique project or model, but a sequence of steps, a way to get the things done, in a less structured, less linear and innovative and more creative way. Also, smartness is not the only solution for all library problems.

Keywords: Smart city; smart library; public library; library marketing; academic library.

1. Introduction

The idea or the models of the smart city contain various interconnected components, such as manufacturing and industry, healthcare, security, shopping, energy and retail, green spaces, waste management, home, transportation, and even farming. Home and cultural elements are also subpart of these models, along with university and education or, society as a whole on a more hypothetical level for smart citizenship. Sometimes, they precisely mention libraries.

Libraries can be narrated as technological and social-intellectual infrastructures, as crucial element in a "larger network of knowledge institutions and public services of which each library is a part" [1]. Its traditional function is to preserve, buy, and make available journals, books, and other media to a community or academic. But, as an information service, they allow people connections and it has the ability to become actual community centers. It is a physical space, or a good place to go and spend a good time, comfortable and welcoming, highly accessible, free or inexpensive, with regulars, or staff [2]. But can they contribute to the development of smart city?

Libraries are scientific and cultural institutions with book stacks, reading rooms, holdings, physical learning spaces, as well as a place of knowledge production and consumption. It play's a role in information and education literacy. They are

also cultural assets, one of those scarce places where technology and productivity meet human and communal values. Will the smart city influence these assets? Libraries have a problem with marketing and advocacy. Forty years before, people doubt the future of the library. Few of them even speculate the end of the library, unable to survive with the social change and digital age, unsustainable, some of the people of the Gutenberg era; says, they may vanish like the dinosaurs [3]. Will the smart city come up with a new outlook? Will it add to the library value and its "gain on investment"?

Can the technological development results in the decline or "significant evolution" of the traditional library? One thing is sure: the emergence of mobility, connectivity, information technologies, digital gadgets in urban environment results in for the future development of libraries also libraries must come up with innovative ideas if they want to remain in the game. In short, libraries must take the challenge of the smart city as an golden opportunity, not as a threat.

This is the topic of our research paper: how libraries can use the opportunity of the smart city? How this new infrastructural ecology can redefine the libraries? What impact does the smart city set on the libraries? The paper summarize, relevant literature reviews about new finding and developments in libraries and about smart city model. Its objective is to present the idea of smart libraries and its potential for the development of smart cities. A theoretical framework for smart library has been presented in this paper.

2. Literature review

With the rising challenges from new technologies and social media libraries has developed new concepts for the advocacy and marketing of academic and public libraries. A lots of case studies, literature surveys show the academic and public libraries used new public policies, information behaviors, new communities, and new technologies to satisfy new user needs. In some of the case this find to be successful as they shaped the vision, mission, core values of new generation of libraries.

2.1 Information Commons

In the world of social media, the concept of control over resources and ownership has been applied to libraries, based on information sharing in online communities. The basic ideas are interaction, networking, shared governance, collaboration, and non-profit business models. The sharing and participation of the resources determines the value of resource and, does not by scarcity of resources. Sharing of

information is the basic principal of libraries. The main interest of the Librarians and other library workers is to provide the library users the access to information or data in any format. They nurture the principles of open licenses, open source and open access [6]. The term "information commons" has been used in library sciences to describe specific tools and services e.g. free available digital libraries, library-based open access journals as well organizing principles, like unrestricted access, openness, and non-profit, non-discrimination, The public institution like Libraries are built on the protection of intellectual freedom, i.e., freedom of expression and information on the participation of academic or local communities. Information commons has been a dominant concept for the promotion of the academic and public libraries. Public libraries in the United Kingdom is being converted into idea stores with informative, several learning, cultural opportunities and entertainment [7].

2.2 Learning Centres

Other models come up with the increase in the academic libraries' performance and attractiveness on campus, like media commons, learning commons, and above all learning centres. These models shift the focus of library away from silent reading and holdings to smart technologies, modular learning spaces and "great good place" features [2], which put user at the heart of the library. The focus of library is on learning. With the facility of learning processes centred on self-monitoring, autonomy and personal knowledge management pedagogy has become a major driver for library design. The major role is played by design and architecture. What kind of technical equipment, physical environment, building fits best to improve and support the quality of student learning [9]? Again, resources sharing facility are essential components of the learning centre. Other important aspects are the attention paid to learning, usage, cognition, experience, and the role of social and mobile technologies.

1.3 Green Libraries

How can the library helps in the conservation of the natural environment? Compared to road transport, chemical industry and power plants libraries are relatively clean, as their carbon emission is lesser than a blast furnace or a coal plant. Yet, libraries buy chemicals and produce waste consume water and energy. Like other services, they are also responsible for environment and pollution. The green library provides an relaxation to the challenge of ecology [10]. The Green library model offers the framework with large range of actions in favor of saving energy, recycling, waste reduction and so on. Some actions are related to important renovations (green roof) or new buildings construction, others can

be perform at any point of time(recycling of paper, use of energy-efficient light bulbs). Other levels of action are awareness raising, education, advocacy, and access to specialized information. Additionally, the model provides standards and checklists for the evaluation of the libraries' ecological impact [11]. The green library model is not restricted to academic libraries, but can be applied to all kinds of libraries. Equipment, clean technologies and Buildings play a central role, but they are embedded in education, training and everyday environmental actions. Also, it introduces sustainability into library sciences field.

2.4 Global Library

The green library model focuses mainly on environmental issue, it remains a somewhat incomplete concept, as it does not include the other dimensions defined by the UN and other international bodies of sustainable development. Libraries are considered to be education institutions, supporting cultural and research, but in fact they are more than just library. They are the local community, sometimes a social agency; a service provider, strong contributors to the sustainable development of mankind and society. Thus, the library management should built up a holistic approach ("global library"). They should show organizational social responsibility to the specific environment of academic and public libraries [12] and make use of the corporate principles.

3. Affinities with the Smart City

The smart city has been illustrated as fuzzy concept with "urban labeling" phenomenon. Some mention the smart city as an optimistic, generic and ambiguous concept of "future city", intended as an "technologically advanced, efficient, green, and socially inclusive city" [14]. The term "smart", is described in several way as efficient, sustainable, livable, equitable, interconnected, instrumented, intelligent city. The smart computing technologies is used for services and the critical infrastructure of city. A city that inspire, shares life, cultures and knowledge. A city that motivates its people to create and flourish their living [13]. Two interesting aspects of smart city are. the multidimensionality of the concept and the focus on information.

3.1 The Focus on Information

Smart cities is also said to be a "ubiquitous digital eco-system". It is developed by a information-centric services with the view to interact with each other [15], as an environment for sharing, information, interoperability, collaboration, and seamless experiences. Technology makes the city brilliant; (smart)people

generate knowledge by means of communication technologies and information. Libraries are subpart of the information ecosystem; they are, intellectual and technological Infrastructures which provides access to information, producing knowledge and information collecting data, creating scientific and cultural value for the community. The smart city shows affinity with the 3I's, i.e., instrumentation (the live real-world data is captured and integrated by using data-acquisition through the social networks and web), interconnectedness (interconnection and integration across multiple processes and systems, including, big data), and intelligence (a new insights from complex analysis of interconnected information drive decisions and actions that optimize outcomes and change the ecosystem or end-user experience).

3.2 A Multidimensional Approach

Even if innovative technologies and digital infrastructures are preponderant components of the smart city, the technological dimension i.e., the institutional and the human dimensions of the concept is embedded in a larger context. The concept of smart city is more than connected objects and new information and communication technology (ICT). It builds on intellectual, creativity, and social capital, "intangible assets" [17], and it needs regulations, governance and policy, i.e., aware decisions "to use technology to transform work and life and in remarkable and positive ways" [13]. Technology is among the fundamental dimension, but technology alone is not responsible for development of the smart city. The psychological people say, the people make the city and the smart people make the smart city. This is another affinity with libraries and their human, societal, cultural dimensions.

3.3 Towards a New Model

Both approach make the smart city concept fair for the development of libraries. A number of studies, especially from India and China, have brought the concept of the smart library [18]. However, term was used is centered on technology and related work skills in a non-consistent way. The American Library Association publish the Smart Libraries Newsletter which focuses on use of Big Data, infrastructures, mobile devices, connected objects, the Internet of Things, radio-frequency identification (RFID). Attention is given to the "soft" domains like government, living, people and economy [17] than to the human and social dimensions.

The human dimension of the smart city, i.e., the role and development of education, creativity, knowledge and learning is placed below technology makes the concept attractive for libraries (Figure 1). At the European Conference on Information

Literacy (ECIL) a multidimensional and inclusive concept of a smart library was presented in 2015, where Adam Sofronijevic and his colleagues described the public library transformation services as an "information literacy hub" for smart people [20]. Another study shows explicit knowledge as an indicator for a city's "informationality"; via digital libraries. An additional service for knowledge is offered on the city level [21] by the digital libraries. The some complementary insights are given below explore library's potential as useful for the development of academic and public libraries. One can consider smart libraries similar with modern libraries. This is because they are moving forward and accepting new technological and societal threats and opportunities. Libraries cannot be smart only if they implement RFID, It can be a part of smartness and multidimensional framework.

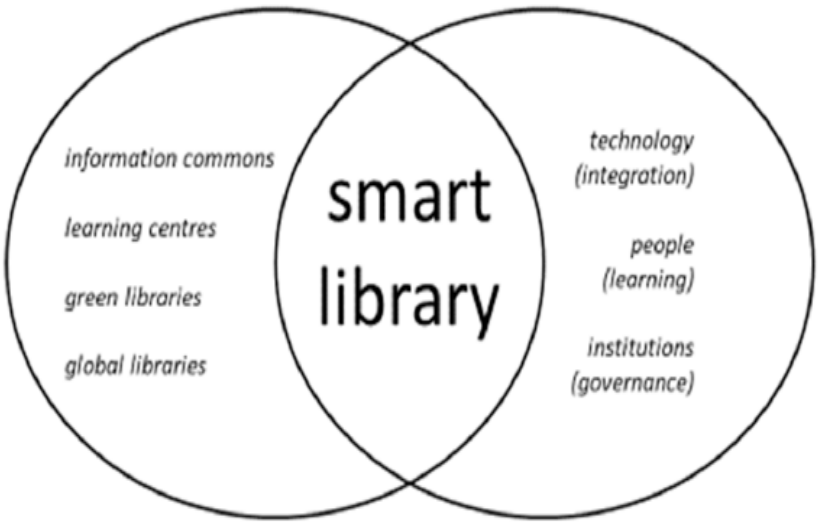


Figure 1. The smart library interface between the smart city and library concepts.

4. Dimensions of Smart Libraries

Smart city initiatives consist of a mix of soft (government, living, people, and economy) and hard (natural resources and transport, energy and buildings, mobility) and domains. For the development and description, smart libraries can be distinguish in four dimensions, i.e., smart assistance, smart individuals, smart site, and smart administration (Figure 2).

4.1 Smart Assistance

The Smart Assistance is the "spirit of innovation" of smart cities. Research papers of smart libraries mainly focus on this dimension, and provide technological solutions, such as mobile, RFID, remote assistance, wireless access, artificial

intelligence, semantic web, machine translation, the Internet of Things, natural language processing, voice and image recognition, augmented reality for delivering new experiences in enjoying cultural heritage etc. The smart library services are described in some papers as library-based ICT platforms, for searching document, collaborative collection building, retrieving information etc. One more characteristic of smart library services is the interconnection and interoperability with other information services. It is an information hub connected with urban services and other libraries in a large informational ecosystem. But, these services and tools are considered smart only if they are user-centered and user friendly. Smartness means new tools and services are developed based on the assessment of real usage. "Smart only if user-friendly rather than intelligent" [13].Smart libraries are required to adapt services based on user needs rather than existing library services.

4.2 Smart individuals:

Smart libraries are made with and for smart people. Smart library are based on the assumption that the smart library user are not only passive consumer of information but also an

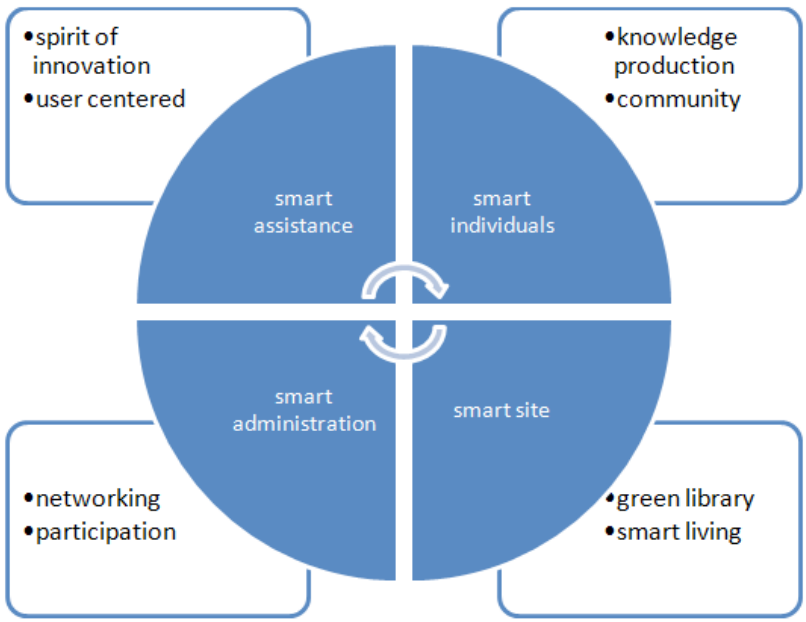


Fig 2. Smart library Framework

active (co)-producer of knowledge. The smart cities people are described in

terms of creativity, flexibility, cosmopolitanism, empowerment, tolerance and participation in public life. This concept of smart individuals can be classified on two levels: Smart community: It not only include user of smart library services and the smart citizen but also the staff of the library, their job and skills development. Production of knowledge: the library user is a producer as well as consumer of knowledge. Sharing, creation, enrichment of knowledge and information are other terms that describe the vision of the smart library user's action and role.

4.3 Smart site

The Smart site refers to the library's place as building. Thus, this can be described as smart environment and environmental monitoring. The smart environment is similar to the green library mentioned above [10,11]. It includes building rating systems, attractiveness of natural conditions, waste management, management of resources, lack of pollution etc. First part is engineering and architecture and second part is ecological functioning and management. The Smart site refers to smart living related to buildings such as control and monitoring building, personal safety, monitoring of electrical devices, and a healthy environment for the public, as well as for the staff. This aspect works to improve the quality of life and attractiveness of the building of library. This is similar with the "hard" attributes of the library architecture design.

4.4 Smart Administration

The last dimension of the smart library is political and institutional. It includes all library features like collaboration, partnership, cooperation, citizen participation and engagement which are related "smart administration"[27]. The community is in the heart of the smart administration, which understands the information technology potential for the development of the library. Community governance and institutional preparation are essential for the success of smart cities" [13].

Smart management: smart library management includes management system and increasing transparency of the administration, optimized and automatic administration procedures, user participation in decision-making processes, improve the quality of library strategies based on real-time analysis of big data and decision-making etc. The library user takes part in the library administration and management.

Smart networking: the second aspect of smart administration is networking. Decisions should not be taken as an isolated institution but collectively based on shared responsibilities between the library community, the library staff and other institutions.

5. Conclusions

The concept of the smart library is somewhat "fuzzy", dynamic and open. It does not constitute a unique smart library model or project, but a sequence of step to get things done, that is less structured, less linear and more innovative and creative. Even though smart library faces financial issues on the implementation of smart services, the library will be benefited in two different ways: first smart libraries will make use of new technology and services for accessing information and knowledge, it will increase the return of investment of public and second it will satisfies users information needs, this will develop the "virtual" social and cultural library assets. This concept may not applicable to all libraries and also only smartness is not solution for all library problems.

In a world where information is universal, libraries need to reinvent their function and role in the new ecosystem so that they can enjoy monopoly over information access. Traditional marketing concept says, without customers, no service. Using this rule, we can say without smart services, no smart people. If the library want to stay in the game of marketing and commerce then Smart library is the only option to defend the fundamental library as a civic landmark [1] in the upcoming smart society.

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Institutional Repository : A Best Practice With Special Reference to MGV's Arts, Science & Commerce College Library, Manmad (Dist-Nashik)

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Abstract: This paper emphasizes about Institutional repository as a best practice followed by MGV's Arts, Science & Commerce College, Manmad which facilitates to host all the e-content and provides search, browse facility for all hosted e-content wherein a learner can easily access the desired material including audio/video learning material, textual material, multimedia enriched materials etc. through a single interface.

Keywords: Institutional Repository, Best practice, College Library

1. Introduction

An *institutional repository* is an archive for collecting, preserving, and disseminating digital copies of the intellectual output of an *institution*, particularly a research *institution*. (Wikipedia) Considering the outbreak of COVID-19, due to social distancing and stay-at-home orders issued by Government Of India, all the schools, colleges & universities have been asked to shut down and make immediate transitions of moving education to online learning. This has posed a challenge for libraries, for users including teaching faculty and students, as well as the services the library has been providing during the pandemic period. To overcome this situation our college library has developed a Institutional repository which facilitates to host all the e-content created by the teaching faculties of the MGV's Institution wherein a learner can easily access the desired study materials through a single interface.

Aims & Objectives:

The aims & objective of the Institutional repository are as follows:

1. To provide open access to almost all e-content created by the teaching faculties of the MGV's Institution.
2. All the e-content created or being created by the teaching faculties of the MGV's Institution should be made available through a single point with search-browse, indexed and user-friendly interface.

3. Interlinking with other type of material (previous year question papers, syllabus, study materials hosted on the website of SPPU, Pune, e-books, e-journals, webinar lectures, articles, learning objects) to present single point access to related scholarly content.
4. To adopt digital preservation strategies to ensure long-term availability of e-content developed by the faculties of related discipline.
5. Provision to host other relevant e-modules available in open access.
6. To promote usage of e-content amongst students and the teaching faculties.

Scope

Scope of study has covered e-content created or being created by the teaching faculties of the MGV's Institution should be made available through a single point user friendly interface. Also interlinkages are given for other type of materials such as previous year question papers, syllabus, study materials hosted on the website of SPPU, Pune, e-books, e-journals, webinar lectures, articles, learning objects etc. to present single point access to related scholarly content.

The Process

E-content created by the teaching faculties of the MGV's Institution are hosted directly on the website & the access is given through the google drive if the data is compatable. There is another way to collect e-content developed by our faculties with the help of google form. The responces collected are use to make searchable with the help of search string according to needs of the users. All the e-content are made available on the website developed by the Librarian for all library users to access, download and print by 24/7 basis anywhere anytim**e**.

The Practice

Users are able to access these e-content using links provided by the library. These e-content as well as the number of users using these e-content are steadily growing. Users can access these e-content anywhere, anytime with facilities for browsing, downloading, printing etc. Usage and user feedback is encouraging and the library is able to add new resources regularly.

Problems Encountered and Resources Required

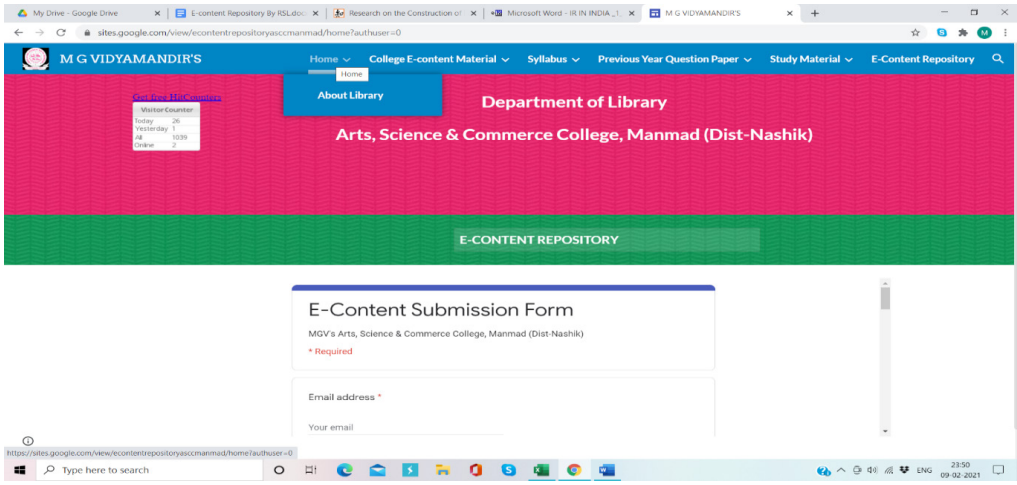
Good computing facilities and infrastructure, skilled manpower must require to create and constantly update the Institutional with new information. There are certain limitations of storage upto 15GB of data can be hosted on a free google site & the data for the e-content are access through google drive only.

Website for Institutional Repository

https://sites.google.com/view/econtentrepositoryasccmanmad/home

Home Tab of the Repository

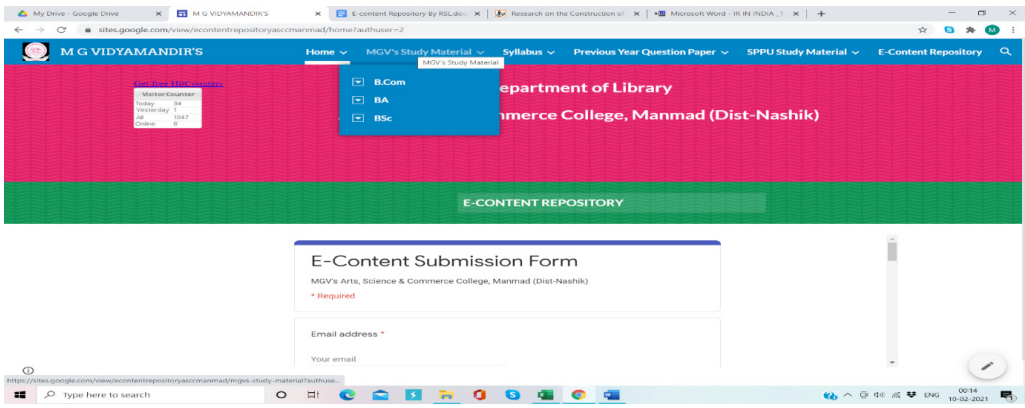
In a Home tab, Information about the library is given where the students and faculties can knows about the services, infrastructure and collection of the Arts, Science & Commerce College library, Manmad (Dist-Nashik)



Screenshot of Home Tab of the repository

MGV's Study Material Tab

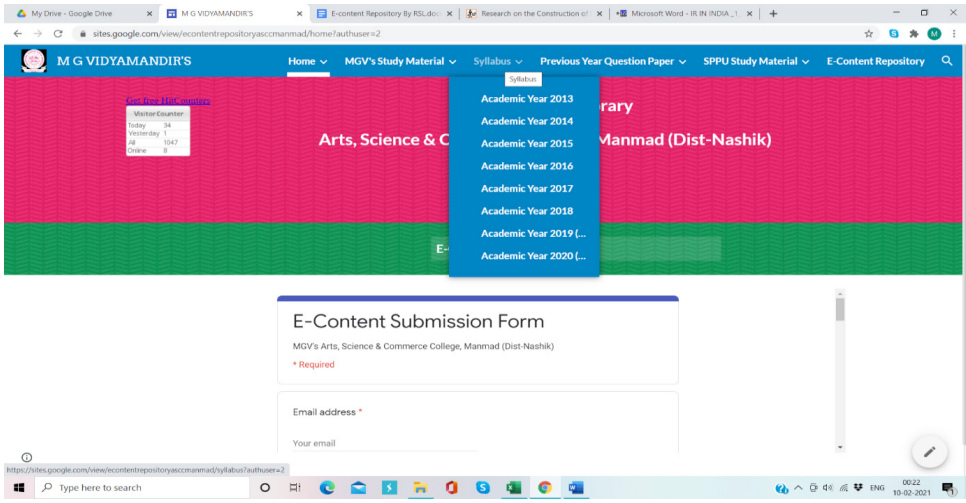
In MGV's study material tab, all the e-content created or being created by the teaching faculties of the MGV's Institution are made available through a single point with faculty wise search-browse, indexed and user-friendly interface.



Screenshot of MGV's study material tab of the repository

Syllabus Tab

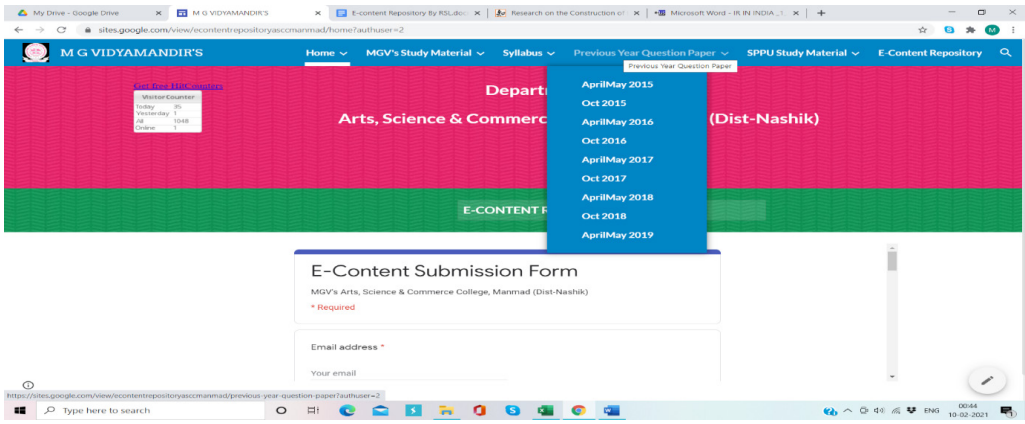
In Syllabus tab, interlinkage with syllabus of SPPU from the academic year 2013 to 2020 are made available with search-browse and user friendly interface where the faculties as well as the students can get access to the year-wise syllabus for their reference purpose.



Screenshot of Syllabus tab of the repository

Previous Year Question Paper Tab:

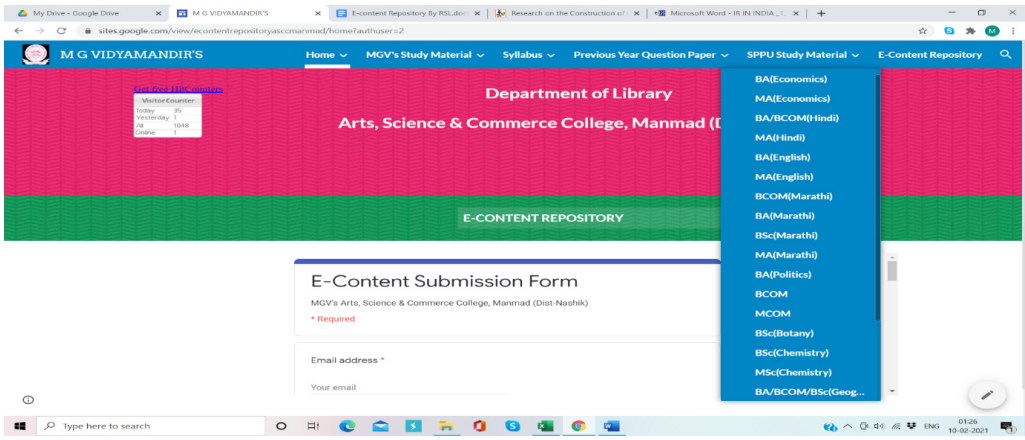
In Previous Year Question Paper Tab, interlinkage with Previous Year Question Papers of SPPU from the year AprilMay2015 to AprilMay 2019 are made available with search-browse and user friendly interface where the faculties as well as the students can get access to the year-wise question papers for their reference purpose.



Screenshot of Previous Year Question Papers Tab of the repository

SPPU Study Material Tab

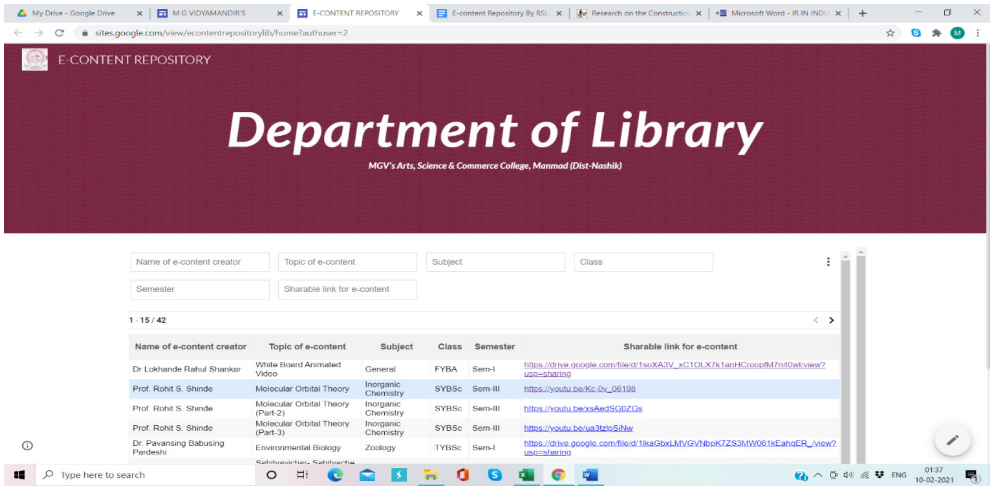
In SPPU Study Material tab, subject-wise direct links of SPPU website are made available with SPPU Study Material where the faculties and students can access the subject-wise & topic-wise notes for their study purpose.



Screenshot of SPPU Study Material Tab of the repository

College Institutional Repository Tab

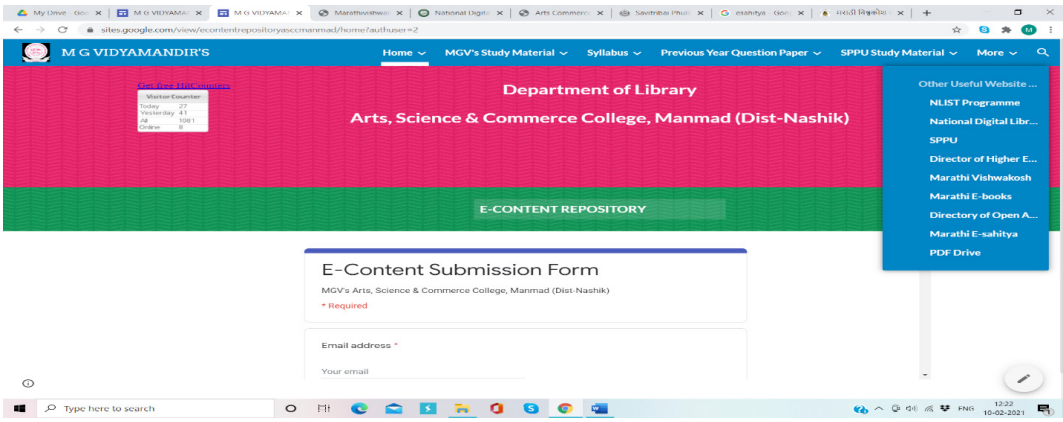
In College Institutional Repository tab, the study material (i.e. notes, ppts, audio-video lectures), seminars, webinars, conferences, workshops and all such activities organized by ASC College, Manmad for the benefit of the students are made available. All the faculties of the college are requested to fill e-content submission form with the sharable link of the material and made them searchable with some searchable fields (i.e. e-content creator, subject, class, semester etc.)



Screenshot of College Institutional Repository Tab

Other Useful Website Links Tab

In Other Useful Website Links Tab, the list of useful websites provided to the faculties and students which helps them in their study, research purpose, project purpose etc.



Screenshot of Other Useful Website Links Tab

2. Conclusion

Institutional Repository is a new technique for e-collection development, managing documents in digital form. By using this repository the institution can offer service like dissemination of information, access to preserve and use information and as well as e-content submission and organization of information. Libraries and LIS professional should have to take part in Institutional Repositories in developing successful and valuable repositories for their institution.

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Online Reading for Pleasure: Parent's Role in Improving Reading Habits Among Children's During Covid-19 Pandemic

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Abstract: The present study narrates various observations and patterns relevant in online reading for pleasure and Information seeking activities among the children during the Covid-19 pandemic period. The study in particular focuses on online reading for pleasure and reading activities of children other than academic or study activities. Nowadays a concept of "Reading for Pleasure" has been talked about among the LIS research fraternity. Recent trends in usage pattern of electronic devices like smartphone, computer, tab, kindle, laptop etc. has shown that children can be engaged for the pleasure reading and schooling in fruitful manner. It is also known from the newspaper columns, social media feeds that there is change in information seeking by the children during the lockdown period. Based on the observation, study has suggestions for the guardians/parents which will be helpful to inculcate parent's role in improving reading habits among the children during the pandemic period.

Keywords: Reading Style, Reading Habits, Online Reading, Covid-19 Pandemic, etc.

1. Introduction:

The study focuses on the "Online Reading for Pleasure: Parent's Role in Improving Reading Habits among Children during Covid-19 Pandemic" when the whole of India suddenly ent into a stringent lockdown due to the Covid-19, Children, Youngsters and Adults of all age groups over the country spent their time at home. Writing, reading and teaching suddenly moved online. People have faced many disasters like pandemics throughout the history, where some of them were more dangerous for the whole community of humans. During this pandemic too once again people are facing a very tough situation i.e. fighting with a hidden enemy called Covid-19. This is a new virus which is spreading over all the age groups over the world very rapidly. Many people are infected with the current Covid-19 virus.

According to U. S. A. based writer Mr. Sidney Sheldon, "Libraries store the energy that fuels the imagination. They open up windows to the world and inspire us

to explore, and achieve, and contribute to improving our quality of life." Due to Covid-19 situation the physical library systems are totally stuck due to maintaining the pandemic rules of social distancing & also help to overcome the spread of virus infection people to people. In this pandemic situation, the role of library and librarian is the most important to serve the whole our community through a digital or electronic platform. Traditional libraries and modern libraries are one of the most important and best places that anybody can go and gain the knowledge without the expectation of having to buy something. Library professionals also conducted the online lectures, webinars, seminars, conferences, meetings, etc. during this period in order to improve the reading for pleasure at home and also serve as a lifeline for various library readers and researchers and many more people in our rural or urban societies (Bhati, P. & Kumar, I. 2020).

The Government of India, teachers, libraries, researchers have started motivating people to improve reading habits, pleasure reading and develop reading style during lockdown period, which may be one of the best way and effective measure to handle the depressing situation with negative-positive interesting activities (Parikh, K. 2020). Government of India suddenly declared a State and National Covid-19 Lockdown for a period of three week. Nearly everyone was asked to stay safe, healthy and at home or at whichever place they are. The Local, National, International autos, buses, trains, flights and all public transport was suspended for 3 weeks. The entire states in India went into a lockdown closing school, colleges, universities, institutions, supermarkets, shops, centers, companies, industries, malls, markets, shops, construction projects, businesses, etc. only except essential and medical services is opened. All of the sudden change, life came to a standstill. Slowly as day after day or week after week passed, the people were indoors for many weeks. This scenario was a best situation for the spread of virus among people to people.

Reading Habits during the Pandemic

The Covid-19 pandemic entailed a sudden change of all phases in our everyday life. Many more years reading literary work has been used as a best tool to support mental and physiological health. Observations in the social media, internet and traditional books or newspaper columns were quick to speculate about changes in all persons reading situations due to pandemic crisis. Books, comics, newspapers, articles, novels, poetry, biographies, magazines, storybooks offered pleasure reading lists to match the Covid-19 lockdown situation. According to Parikh, K. (2020) during lockdown people many have many other activities to do which is ranging from: work from home, learn from home, sitting at home, doing homework, doing household work, writing, reading, use of smartphone, watching television,

playing games, cooking, joint reading, together aloud reading for pleasure, doing new cooking, helping cooking, cutting fruits, cutting vegetable and many more to pass the time at home.

During this period the traditional book reading pattern of children's or students have not changed with the influence of the social media and smart media. Pleasure reading habits whether using smart modern patterns or traditional patterns play an important role in developing and improving children's performance. Reading is the process and early support system in reading improvement impacts us for lifelong period and no matter which age group people belong to, a purpose for pleasure reading is necessary. According (Priyanki, V. & Balvant, T. 2020) most of the children enjoy reading during such period. During the pandemic period, most of the children were reading every day. Various types of reading sources are preferred by children for pleasure reading like E-books, e-articles, e-comic books, e-projects etc. and also traditional books while also using audiobooks for listening. The main resources of reading material used to update their current awareness, pleasure reading and subject knowledge are newspapers and magazines. Children also use to resort to online reading newspapers, comics, books, etc. to get and update their knowledge. Children are improving reading style during this period like quick browsing of e-resources on internet, in-depth online reading, note-making online, online classes and meetings and many more activities. During pandemic period children are spending most of their reading time on online platforms. Many children spent their time on smartphones while very less children spent their time for reading offline books. Such reading was mostly done by children using online reading sources through various e-devices like smartphone, computer, tablet, laptop, kindle and other e-devices. For pleasure reading habits, for seeking new information and for updating the current awareness and subject knowledge through online reading materials, they spent their time for pleasure reading and developing their reading style. (Karim, N. S. 2007).

Reading E-Books Online During Pandemic Period

According to Prafula Grace Busi (2020) there are various types of e-resources freely available online for reading during the pandemic period. As the Covid-19 lockdown period continues child-parent stuck indoors are looking for new reading ways to entertain themselves. Pleasure reading habits as an activity can be beneficial and extraordinarily comforting, to help bookworms in these stressful periods, a few online platforms are opening up their e-resources including e-books, e-comics, e-articles, e-journals, e-biographies, e-theses, e-projects, etc. where one can read online and download for free. During pandemic period child-parents are downloading e-resources regularly and developing small home electronic library

and home reading rooms. Many people have started the e-library or digital library in their home for themselves. Books at home can make kids smarter. Various kinds of digital content is accessible to the world's largest selection of audiobooks and the apps are optimized for audiobooks. Nowadays, younger and older generations access e-resources and read on e-devices like smartphones, laptops, computer, kindle, tablet, iPad, etc.

Audiobooks

During Covid-19 lockdown period audiobooks are getting more and more popular. The main reason is people don't have to buy books, CD-DVD, etc. You can access the audiobook version of the new books from your favorite authors or writers. The benefits of audiobooks is that readers can listen all types of digital books in one place which are also easy to use and sync between connected devices. Readers don't need to keep that old CD, DVD, Radio, etc. and can just listen to audiobooks anywhere and at anyplace. Many people have discovered during pandemic period the joy of playing audiobooks on their speakers such as smartphones, computers, laptops, tablets, Amazon Echo, Google Home, Apple HomePod, etc. The most interesting and most popular Android audiobooks applications are the following:

- **Google Play Books:** Google play books brought audiobooks to play store in January 2018. The application or app is now a usage hub for various types of digital contents: e-books, e-articles, e-comics, textbooks, novels and many more-eventually audiobooks.
- **Audible:** It's the most advanced and largest audiobooks service in the world offering exclusive titles, audiobooks, audio shows and book series. Amazon audiobook platform, Audible recently announced that kinds W.W.W. can instantly stream a collection of various content across six different languages. The stories, categorized by every age group can be streamed through the audible application on smartphone, computers, laptops or kindle.
- **LibriVox:** It is latest and offers free audiobook version of classic books. The app gives advanced service and easy access to Bluetooth controls and Bluetooth enabled speaker or headphones. A large collection of free audiobooks and easy sound management.
- **Libby:** Started by OverDrive, Libby is a next generation app to manage the content you borrow from public libraries. If readers have ever borrowed

e-resources from local library, readers will love libby. Very interesting and important feature is that, if you connect to local library which offer audiobooks, you can access and borrow them just like e-resources and you can play them within the app. The catalog of audiobooks and e-books is available. It's a very simple, enjoyable and one can listen to audiobooks for free. The benefits of Libby are reading e-books and playing audiobooks from local libraries and public libraries, sign in to multiple readers or libraries.

- **AudioBooks:** Audiobooks are given access to free based titles and paid based both. It offers over 100,000 paid audiobooks and 7,000 audiobooks which can be downloaded for free.
- **Oodles:** During Covid-19 lockdown period people are looking for or are interested mostly only in free e-books and audiobooks from legal sources and services. It gives over fifty thousand e-books and fifteen thousand audiobooks from the public domain. You can find and access e-books in either Hindi or English language and listen them in offline mode.
- **Kindle:** Most of the child-parents are using Kindle during pandemic period. Kindle is one of the most popular and interesting e-books reading application on Android and also play audiobooks. It is first e-reader developed by Amazon in 19 November 2007.
- **Scribd:** It offers e-books and audiobooks for subscription based service. It offers all contents including e-books, audiobooks, journals, articles, and magazines are available for free for a month.

Joint Reading during Pandemic

Joint reading has also been used for children during this Covid-19 pandemic period. Pleasure reading children's books to child can be incredibly important. When child-parents are constantly reading together, it develops a relationship through the books that can lead to a discussion about the importance of the world in a way they can realize, leading to a stronger connection. The brain is a muscle that needs strength to continue its development. Reading is an easy way to help keep purpose and focus in the minds of students which has created many barriers in learning. Reading not only increases students' curiosity about intelligence and literacy, but also helps them develop important skills such as analytical thinking,

creativity and comprehension. These are important factors to help students approach their education until the formal education system is fully recovered. Reading increases literacy and literacy changes lives. Reading gives us the ability to make progress in the lives of others and to immerse ourselves in alternative realities. By encouraging reading among students who have the opportunity to do so and focusing on providing academic support to those who are unable to do so, we can take small but effective steps to combat illiteracy in these challenging times. The Sun Books team is also encouraging teachers and parents to use tablets at home and in their community to help children learn and read, with over 400 e-books and educational activities on the Internet and non-essential apps.

Reading for Pleasure

Why are traditional books and electronic books important for children in Pandemic period? Reading for pleasure has powerful, measurable real-life benefits that can transform lives. Here are some tips to keep children engaged in reading for fun:

- **Pleasure Reading Habits:** The parent role is very important during pandemic period for ex. joint pleasure reading, reading with children, reading from children, reading together, etc.
- **Joint Pleasure Reading:** Child-parent read joint stories books, mystery story, mythological story, novels, dramas, poetry, articles, newspapers, fictions, traditional books, e-books, comics, travels books, travels articles, motivational articles, science fictions, science articles, children articles, editor articles, historical articles, historical books, motivational books, motivational novels or story, picture books emotional stories or novels, religious books, etc.,
- **Number of all Readings:** Forget the level of achievement and let the kids choose their hobbies; comics, storybooks, novels, dramas, poetry, motivational books, articles, fiction, newspapers, magazines, graphic novels, pocket books even sports pages and also including e-resources like e-books, e-articles, e-storybooks, audiobooks, etc.
- **Encourage re-Reading:** If books feel like familiar friends again, enjoy reading for pleasure, read aloud, child-parent read aloud.
- **Storytelling:** The children were told stories by their grandmother and

grandfather during Covid-19 lockdown period.

- **Try Listening:** Audiobooks, story tell, music and watching videos, movies, songs can be one of the books that sound annoying.

2. Conclusion

Though the ecosystem of online learning and reading was available earlier, the pandemic has changed the way people use these services. There is an increased use. Libraries and LIS professionals have to study and develop their strategies newly in order to cater and deal with the changed scenario and manage it effectively according to changing dynamics while also developing new strategies and tools in order to increase their presence and reach a larger section of society.

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ICT Marketing and Promotional Tools for Academic Library

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Abstract: Library consists of various types of resources such as huge collection of books, journals, magazines, reports, e-magazines, e-resources, and audio-visual data. Library has its role to fulfill the demands of the users. He must know the availability of the resources. Librarian professional can make aware them through marketing and promotion of these available resources to satisfy users need. In this study researcher has studied about electronic or digital marketing tools for the librarian professional.

Keywords: Digital Marketing, Social Media.

1. Introduction:

ICT has changed the face of the world. ICT creates the digital environment and we are living in that environment. It touched the every area of the human being. It has changed the need of the people, users and customers. ICT helped us to make available information in electronic form. With the help of Internet this information reaches to the globe. During the period 1969 to 1973 started the marketing in academic libraries. Marketing and promotion is very useful for libraries and librarian professional to improve their quality and uses. Many libraries have various services and products but users of that library have not knowledge about the availability of its products. To create awareness about the available products and information such as books, magazines, journals, e-journals, e-books, videos, audios, services and any other resources of the library by marketing and promotion.

Objectives of the Study

1. To study about the marketing
2. To study the need of marketing of library products and information.
2. To study about useful way of marketing and promotion of library products.
3. To study about useful electronic media for the marketing and promotion.

Methodology

Throw this research paper researcher intended to study about the sources for the marketing and promotion of the library products. For that purpose, research has studies the available primary and secondary data such as books, e-books, journals.

Information as a Product

Marketing is a promotion of products. "Products are the key components in the marketing exchange. Successful marketing rests on the ability of the product to deliver a solution to the customer's problem or to deliver the bundle of benefits that a customer seeks" (Webster, 1994). Library have its own products i.e. books, Journals, Magazines, Videos, Audios, etc. which librarian professional need to promote to make aware about the available products to users. Marketing creates awareness about the products to the users or customers. It can help to users to seek their products easily.

Definitions

The association of Research Library (Smykla, 1999) Explain that, Marketing is "The organized of ideas, goods and services to create exchanges that will (if applicable) satisfy individual and organizational objectives. Marketing collects and uses demographic, geographic, behavioral and psychological information. Marketing also fulfils the organization's mission and like public relations inspires public awareness and education."

Digital Marketing

In the world of ICT (www.digitalmarketer.com/digital-marketing)Marketing changed its mode. It replaced previous mode of marketing with electronic and social media. Since, it is necessary to take advantage of Digital marketing for library promotion and marketing. "Digital marketing is the act of promoting and selling products and services by leveraging online marketing tactics such as social medial marketing, search marketing, and email marketing." It will help us in following ways.

- It will make it easier to create awareness and engagement
- It will provide benefits of word-of-mouth and social sharing.

Need of Marketing

It is essential to create a link between the library and its users. It will create awareness among the users and they will come to know about the available products and information in the library. According to Savard (2000) "library and archives are facing the challenges for a long time. To find out specific answer to facing challenges librarian need to understand the importance of marketing." Duke and Tucker (2007) explain the importance of the marketing such as,

- To fulfill the objectives of the library.

- To satisfy the user's demand.
- To attract users.
- To create awareness about services which providing by the library.
- To improve library service.

Planning for Marketing and promoting services:

Library is huge collection of books, services and all type of resources. User of that particular library doesn't know about the availability. To create awareness about the library services library must reach to the users. First of all librarian professional must have a plan to promote its services and products. Secondly he should set the objectives regarding marketing, which helps him to move on the right direction. Thirdly Librarian professional should adopt a user centric approach, which will help him to deliver the demanded information to the users in right time. Secondly he must arrange the training about the marketing for the staff. Fourthly arrangement of fund is necessary. Without financial support plan cannot execute successfully. For the successful execution of the librarian professional should be aware about each and every problem he has to face.

Marketing Tools:

There are various tools available for marketing and promotion of library products such as,

- Online Survey
- Library Website
- Web 2.0 Tools
- E-mails
- Blog
- Display Screens

Online Surveys

A survey with the help of Internet is the online survey. User whenever visits the library website asks to respond to the questionnaire. It will provide huge data about users approach, needs and awareness about the library. Through survey librarian professional come to know user's demand and their views. They will provide few suggestions. Collecting data and suggestions of user's will help in improving library services and products. Librarian professional conduct this survey electronically.

Marketing Through Websites

As we know that the Information and Communication Technology (ICT) has changed the interest of the people. It also affected library services and affected the demand of the library users. To satisfy the users it became necessary for Librarian professionals to develop their library websites to provide services and create connection between users and library. It represents the whole library of the institutions. It support to users to meet their questions and answer without visit to library. It will help to library professional to deliver demand of the user according to their demands on time. Today lot of user searches their required information on the website. Users visit various websites to find their required information. Library professional can take advantage of library website to promote library availability. He can post various information, promoting videos, audios, e-books, e-journals, e-magazines, digital images, online articles and lot of other information regarding library.

Mobile Apps and Social Networking Platform

Mobile apps and Social Networking Platform are widely using media. It has provided opportunities to reach more people within few minutes. Today, most of the users are using android mobile phone with internet connections. They use various mobile apps and social networking sites on their phones such as Whatsapp, Facebook, Twitter etc. Librarian professional can take advantage to share information and availability about the products and promote them. He can share promotional videos and posters, events, audio, news and can do marketing library products. Librarian professional can use the library alert services like banks and other institutions.

Whatsapp

Whatsapp is a popular mobile app provides wide range services. To keep the users update librarian professional can take advantage of whatsapp. Librarian professional can infirm about the books, various journals, e-books collections time to time to their users. It will create awareness in library users about collection in library. We can create a group of users who have same interest and fulfill their demand in easy way. In the same way we can send promotional video document on this app. Library professional can share promoting videos, events and other important e-data such as e-books, e-journal, e-magazines, digital posters, audios, and other important information for users.

Facebook

Facebook is widely popular social networking platform among the users. "Facebook is a popular and free social networking website that allows registered

users to create profiles, upload photos and videos, send messages and keep in touch with friends, family and colleagues." (Rouse, 2009). On the facebook librarian professional can create his library account for academic students. Promoting their available library services on the page he can attract and create awareness in users. He can also share various events, promoting videos about the books and authors, library news. Through this he can build friendly relationship and atmosphere with users. Librarian professional can come to know the interest through sharing documents and comments of users.

Blogs

According to Gunelius, (2014), "A Blog is a website consisting of entries appearing in reverse chronological order with the most recent entry appearing first." It is a popularly used by the bloggers to promote their thoughts and other literature of their interest. Anyone can search and visit their blogs according to their interest. Blogs facilitates the visitors or user to ask their questions. And bloggers can satisfy the user's questions to answer them. Librarian professional should develop their library Blog and post their library information and promote their products. Librarian professional can publish here their news, events and encourage users to see library services.

2. Conclusion

In order to fulfill the demand of users and the goal of library, library must reach to the. It can happen only through the marketing and promotion of the library products. There are various marketing and promotional ways to reach to the users. As we are living in the digital age librarian professional must use the new digital marketing ways to the users. Through this ways users can meet the required information in no time. Use of digital marketing and promotion librarian can reach to the users and find out their interest. For that purpose library professional can use website, blogs and social media effectively.

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Online Information Resources and Learning Management in Virtual Library Environment through LMS-MOODLE

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1. Introduction

The learning management system has become an important part of the higher and technical education. It is helpful for physical as well as online education. Effective use of online infrastructure and continuous growth of information in education system transforming learning environment. Integration of learning management into library has been a standard growth in librarianship for supporting learning and teaching. Online educational resources and teaching in a virtual learning environment using learning management system can be more effective and constructive. In current scenario, maximum information resource centers are providing online educational resources and services to their users through virtual environment. It is impacting on their continuous education, distance education, research, self-study, competitive examination, and many more. LMS-MOODLE is very effective and standard platform for virtual learning to enhance the professional growth and academic performance. Library plays an important role in teaching learning process in physical or online learning through learning management system. it is right time for the integration of library resources and tools with LMS, thereby promoting effective learning and use of library resources.

Learning Management System-MOODLE : An overview

The learning management system is the infrastructure that delivers and manages instructional content, identifies and assesses individual and organizational learning or training goals, tracks the progress towards meeting those goals, and collects and presents data for supervising the learning process of an organization as a whole (Szabo & Flesher, 2002). MOODLE stands (Modular Object-Oriented Dynamic Learning Environment), system and program developed by Martin Dougiamas. Is one of the most popular LMS across the world. It is a web-based application that educators and researchers can use to develop e-content and complete online courses. MOODLE is originally developed for Linux operating system, but now it is compatible with windows and MacOS. Learning management system has various functions for teachers, researchers and students to view multimedia lectures, communicate with their professors and learning communities, online class test,

download course materials, take online quizzes, submit homework, classwork assignments, evaluation and assessment process.

MOODLE an integrated LMS

- It is an easy way to connect and communicate with students and faculty anywhere and anytime.
- MOODLE is an e-learning and online information access tool that offer easy and simple solutions to any academic institution.
- It provides fastest way to share online resources like doc files, presentations, pdf, useful links, database, and so many.
- Enhance the learning with online information services and activities
- It provides online evaluation and assessment process
- It saves time and improving connectivity among student and teachers.
- Encouraging co-operative and collaborative learning.

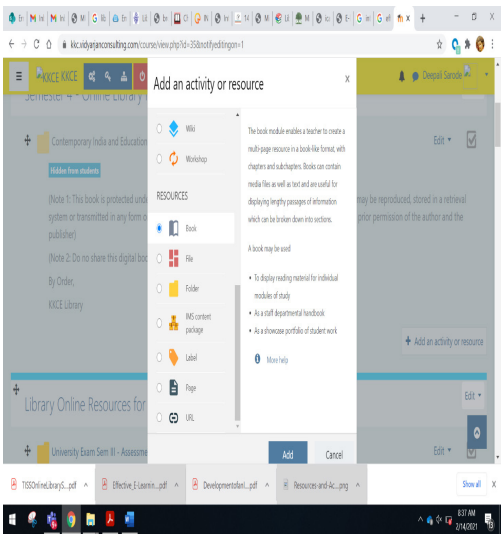
Learning Management in library through MOODLE:-

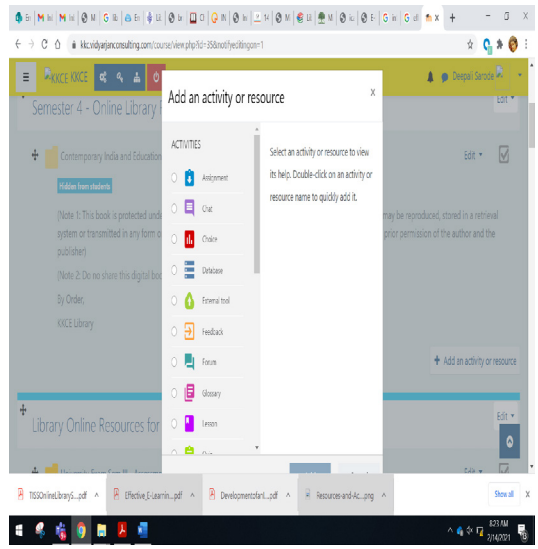
The library professionals can perform best role in designing, management, and organization of information resources for the LMS-MOODLE. Some features of course management for online learning are-

- Files & Folders- Library professionals can upload files and folders according to their syllabus
- Assignments:- Library activities are done through journal and e-journal article review assignment. Students can submit any digital content (files), such as word-processed documents, spreadsheets, images, or audio and video clips.
- Chat:- Synchronous communication by learners for any solution. Regular meetings of students participating in online courses to enable them to share experiences with others in the same course but in a different location
- Forum:- The forum activity module enables participants to have asynchronous discussions i.e. discussions that take place over an extended period. A social space for students to get to know each other
    - For course announcements (using a news forum with forced subscription)
    - For discussing course content or reading materials
    - For continuing online an issue raised previously in a face-to-face session

- For teacher-only discussions (using a hidden forum)
- A help Centre where tutors and students can give advice

- Quiz:- The quiz activity enables a teacher to create quizzes comprising questions of various types, including multiple choice, matching, short-answer and numerical
- Database:- The database activity module enables participants to create, maintain and search a collection of entries (i.e. records). The structure of the entries is defined by the library professionals as several fields. Field types include checkbox, radio buttons, dropdown menu, text area, URL, picture, and uploaded file.
- Feedback:- The feedback activity module enables a library professional to create a custom survey for collecting feedback from participants using a variety of question types including multiple choice, yes/no or text input.
- Survey:- Survey activity module provides a number of verified survey instruments that have been found useful in assessing and stimulating learning in online environments. A librarian can use these to gather data from their students that will help them to learn

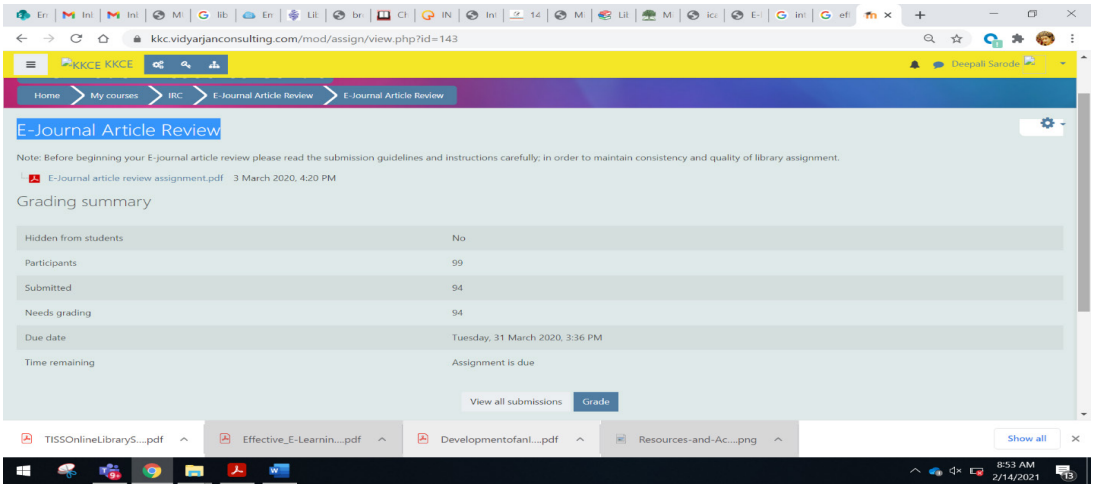




(Source: https://kkc.vidyarjanconsulting.com/mod/assign/view.php?id=143)

- Book:- A book may be used
  - To display reading material for individual modules of study

- As a staff departmental handbook
- As a showcase portfolio of student work



(Source: https://kkc.vidyarjanconsulting.com/mod/assign/view.php?id=143)

In each section, we can add various activities and resources for students. Especially in assignment, Students can upload library review assignments to mark. librarians get an automatic alert when a new assignment arrives. All marks can be stored in the Moodle grade book.

Shows various learning activities supported by the virtual library information services into LMS:

Online library reading sessions, Paper presentations, Preparations for exams through question papers and study material, E-journals and online databases, discussions on forums, solving problem tasks on particular topic, Academic calendar, Library notice and events, Notifications on latest updates, etc.

Library users are highly satisfied with libraries' e-services into learning management system which are

- Saving time for searching learning materials
- Easy access to relevant sources for learning of E-resource database and another online database
- makes learning process dynamic
- encourages development of soft skills

Nowadays, increases in online learning and in use of LMS at institutions for both online and face-to-face courses have made LMS embedded librarianship

much more feasible and more important for librarians. Library professionals are effectively using online learning LMS platform for e-service and activities.

Library Support:-

Information resource centers are knowledge hub and library professionals are playing important role in effective support for teaching faculty to develop e-content and providing upgraded information service to students. Some useful information services library professionals can provide:-

- Provide support in development of web-content management
- To provide online book and journal content exhibition
- To help in search of online databases
- Develop digital repository
- To help in the process of evaluation and assessment
- Conduct online test, quiz, and assignments
- Provide important links relevant to subject and circulars
- Set academic library planner- events, workshop, notice, and activities
- Online open educational resources
- Organize webinars
- Connect with social networking sites

2. Conclusion

Latest trends in libraries show the importance of libraries' virtual presence through virtual learning and online information resources into LMS-MOODLE. The main goal of this paper is to explore effectiveness of LMS-MOODLE for learning and resource sharing on this platform. Library professionals should take advantage of this opportunity to show skills in virtual environment and fulfill the need of library users. Learning Management Systems are changing the process of teaching and learning. Now students are using LMS-MOODLE platform for accessing their course materials i.e. syllabus, class notes, presentations, assignments, quiz, class test, important links, and other learning materials. In this virtual environment, it is imperative for the library to remain an active part in the learning management system and virtual learning environment that is taking place.

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A Study on Library Security System with Particular Reference To Government Degree College Libraries of Telangana State

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Abstract: The main objective of the study is that to know the library security system applied in degree college libraries of Telangana State. The study is conducted in 111 degree college libraries of Telangana State. The study focused on need of security system, status of library automation, types of security system, types of attackers in information security, methods for information security. The study also focused on library security regarding, collection, infrastructure, staff and patrons used in degree college libraries of Telangana State.

Keywords: Library Security System, Types of Security System, Attackers, Information Security

1. Introduction

Access to information is vital to human civilization. The present age is characterized as the age of information. 21st century world is changing to an electronic era. In the information era past few decades computer applications have brought rapid changes in Library and Information Centers, in the form of information collection, storage, and dissemination. There is a paradigm shift from traditional libraries to digital libraries, therefore security is more important. There are various library security systems are available today they are mainly, Security Gate, Automatic Alarming, RFID Technology, Automation of Library, Magnetic Strip affixed each item, Web Cameras etc. Security prevention is the best policy for protection of unauthorized access, avoidance of loss of books and safeguard of library material.

Need for the Study

There is a paradigm shift from traditional libraries to digital libraries. Very limited research is done on security systems in libraries. Therefore a systematic study is essential in degree college libraries of Telangana State to find out ways and means

of library security regarding collection, infrastructure, staff and patrons. The study finds out the current state of the security systems, types of security system, types of attackers in information security, methods for information security, used in the degree college libraries of Telanagana State.

Objectives of the Study

1. To find out the current state of the security systems adopted in the degree college libraries of Telangana State.
2. To find out different types of the security systems using in the Libraries
3. To find out the different types of attackers in information security in the degree college libraries of Telangana State.
4. To find out the advantages and limitations of the electronic security systems in the Libraries

Hypotheses of the Study

1. Manual and Technological security systems are available in the libraries
2. Traditional Security systems are used in the libraries
3. There is no attackers in information security in the libraries
4. Electronic Security systems is more advantageous in the Libraries

Statement of the Problem

This study answers Library Security System with particular Reference to Government Degree College Libraries of Telangana State

Scope and Limitations of the Study

The scope of the study is Government Degree College Libraries of Telangana State and the limitations of the study is security systems adopted in the Government Degree College Libraries of Telangana State.

Literature Review

Dr. Jagadish M.V (2019) study reveals that crime rate is increasing day to day in libraries, book theft as become a common phenomenon in libraries. **Mamata and Dr Vijay Kumar (2019)** in their article entitled as "Library Security tools & techniques an overview" opined that Library security is one of the major challenges being faced by the Library professionals. The number of resources and users are increasing day by day and this causes increase in the vulnerabilities of theft and other related issues, further opined that Anti theft systems, security from natural hazards print as well as electronic materials needed. **Vikas Singh and Madhusudhan Margam (2018)** study reveals that information security measures need to improve in the university libraries. **Neeraj Kumar Singh and Preeti Mahajan (2017)** examined

that circulation of library documents has increased, library collection has become more secure, etc. with the use of RFID technology a majority of librarians indicated "high cost" and "lack of proper RFID standards and protocols" as a problem in implementing RFID technology. **Lucky Oghenetega Urhiewhu, Daniel Emojorho and Joy Emmanuel Omah (2018)** study reveals that security methods need to adopt like installation of Closed Circuit Television (CCTV), secret pages of book stamped should not be revealed to users by any library staff, Orientation of how to use the library should be done in every semester.

Methodology of the Study:

Survey Method adopted for data collection. In this analysis 136 questionnaires were administered during in the month of January and February 2020 to the Degree college Librarians and Library in-charges in Telangana state. 111 questionnaires were received. The data is analyzed on the basis of simple statistical method using SPSS.

Data Analysis

Collection of books in Govt degree college libraries in Telangana State

The collections of Books depending on the age of the library. The older colleges have collection more than 50,000 books even though the younger colleges which was established in the year 2008 is having more than 5,000 collection of books. Autonomous colleges, NAAC going colleges and other colleges those who are maintaining PG sections they are procuring journals and magazines also. Regarding the UGC-INFLIBNET-NLIST e-resource only few govt. degree colleges renewed this academic year. Only 18 govt. degree colleges renewed the NLIST e-resource for the academic year 2019-2020. (Source: http://nlist.inflibnet.ac.in/members.php).

Table 1: Collection of books in Govt degree college libraries in Telangana State

Year of Establishment in between.	Collection of Books
1950-1960	50000-60000
1960-1970	40000-50000
1970-1980	25000-30000
1980-1990	15000-20000
1990-2000	10000-15000
2000-2019	5000-10000

Library Staff Details in Government Degree College Libraries in Telangana State

Professionally trained person will give better services for the enrichment of the academic library. The below table reveals that only 35% well trained librarians are working in TelanganaGovt degree college libraries also there is no supporting staff for major libraries.

Table 2: Library staff details in Government degree college libraries in Telangana state

Library Staff	Number of working Professionals	Total Govt. Degree Colleges
Librarian	54	136
Asst. Librarian/Record Assistant	22	
Library Attender	28	
Part time Attender/Part time D.T.P Operators	16	

ICT Infrastructure and Library Automation status of Govt. degree college Libraries in Telangana State:

The INFLIBNET centre provided SOUL (Software for Universities Libraries) software to all these colleges and collegiate of higher education sanctioned all the ICT infrastructure which required to run the SOUL software. Majority of government degree colleges in Telangana had internet connections and sufficient ICT infrastructure to do library automation like scanner, barcode readers, higher configuration systems towards purchase of IT infrastructure.

Table 3: Present Status of Library Automation in GDC's in Telangana State

Library Software	Status of Library Automation	Number of Colleges
Open Source software	Completed	8
	Partially Completed	0
	Not initiated	0
Paid Software (SOUL)	Completed	3
	Partially Completed	28
	Not initiated	
Software not Initiated		96

Preference of security used in Government Degree College Libraries

Government Degree College Libraries in Telengana adopted different types of security they are mainly Network Security, Database Security, etc.

Table 4: Preference towards security type

Types of security	No. of response	Percentage
Network security	12	11%
Database security	5	4%
Others	94	85%
Total response	111	100%

The above table shows that, 12(11%) library uses of network security, 5(4%) library uses of Database security,94 (85%)library use of other security like Physical security and CCTV Security.

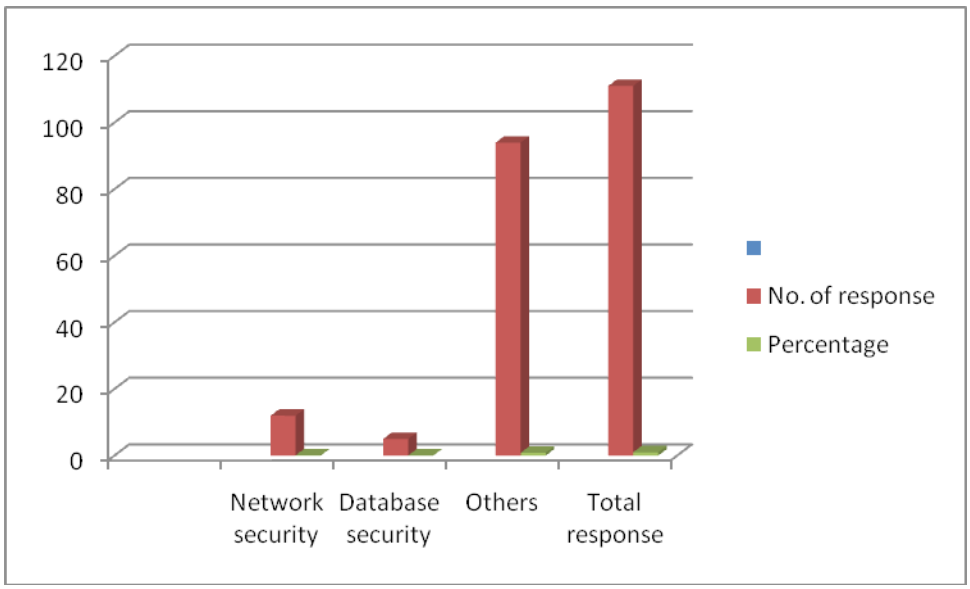


Fig 1: Preference toward security type

Security used in Library Software Packages

Government Degree College Libraries in Telengana adopted different types of security they are mainly Password Security, Licensed Security, Web based Security, etc.

Table 5: Preference toward Software security

Types of security	No. of response	Percentage
Password security	97	87%
Licensed security	13	12%
Web based security	1	1%
Total response	111	100%

Above table shows that password security [97/111(87%)] is the favorite technique used for library software security. Only 1/111 (1%) library provide licensed security and 13(12%) library provide web based security for library software package.

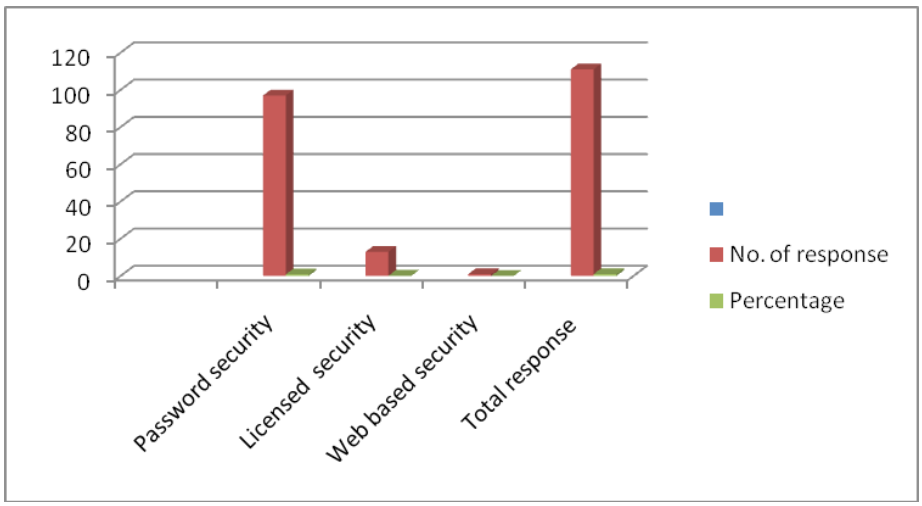


Fig 2: Preference toward software security

Types of Attackers in Information Security

There are different types of attackers in Information Security; they are mainly Thieves and Hackers, Unauthorised users and websites, Viruses etc.

Table 6: Type of attackers

Types of Attackers	No. of response	Percentage
Thieves and Hackers	38	34%
Unauthorized users and websites	13	12%
Viruses	43	39%
Others	17	15%
Total response	111	100%

The above table shows that 43 (39%) are affected by the viruses, 17(15%) are affected by the others attackers, 38(34%) are affected by the Thieves& Hackers

and 13(12%) are affected by the Unauthorized users. Virus attacks which destroy library system in today's library environment.

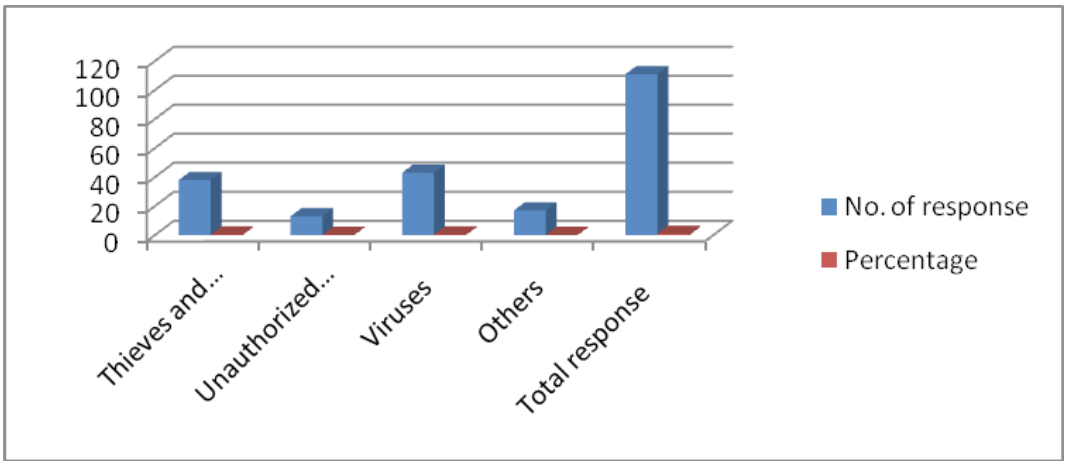


Fig 3: Type of attackers

Preference toward techniques for securing E- Resources from attackers

Whenever attackers destroy systems there are various techniques used by LIS professional for protecting their information.

Table 7: Preference toward techniques

Preference toward techniques	No. of response	Percentage
Password	12	11%
Firewall	1	1%
Antivirus	48	43%
Backups	15	13%
Web cameras	35	32%
Total Response	111	100%

Above table shows that 12(11%) by Password Protection, 48(43%) by Antivirus, 15(13%) by backups, 35(32%) by Web cameras and 1(1%) by Firewall Protection.

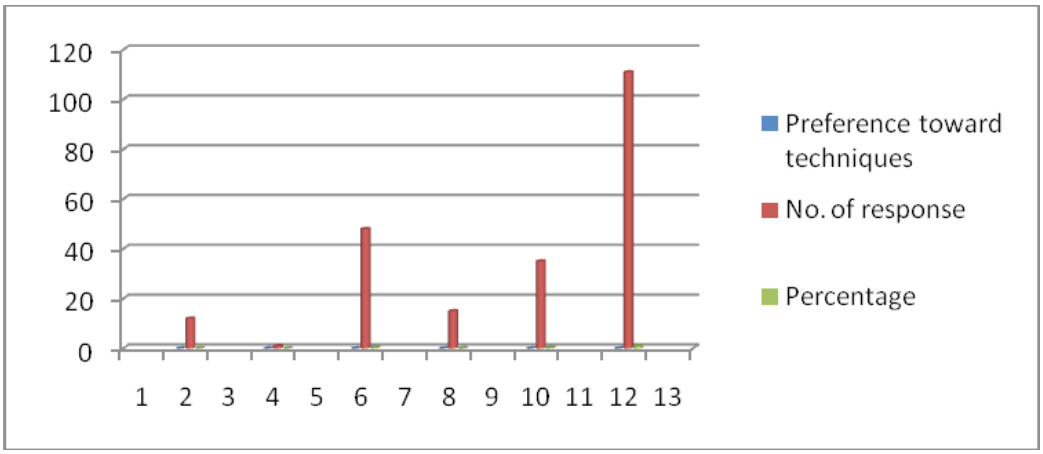


Fig 4: Preference toward techniques

It is clear from the graph that Password protection, Antivirus, backups etc. are the more preferable security techniques used by Govt. Degree College Libraries in Telengana.

Continuous steps for securing Information

The below table shows that libraries use backup of information, continuous update antivirus and ban on unauthorized access to securing information.

Table 8: Continuous efforts for Information Security

Methodology	No. of response	Percentage
Regularly update antivirus	65	65%
Store backup of data	28	25%
Stop unauthorized accessing	12	10%
Others	6	5%
Total response	111	100%

The above table shows that 65(65%) are regularly updated antivirus, 28(25%) are Store backup of data, 12(10%) are in Stop unauthorized accessing and 6(5%) are using some other techniques used in Govt. Degree College Libraries in Telengana.

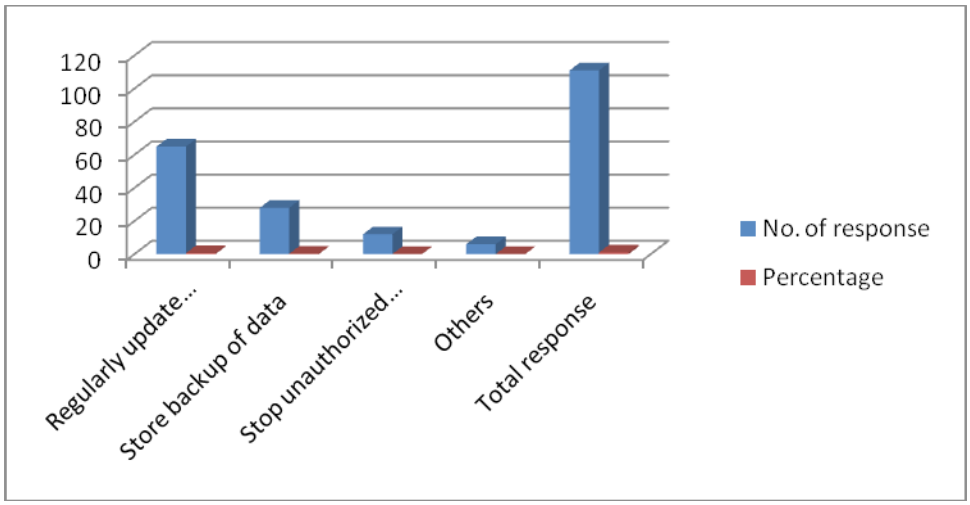


Fig 5: Continuous efforts for Information Security

Findings of the study

1. Majority of the Government Degree College Libraries are using Password Security.
2. The Most common type of attackers in the libraries is Virus attacks.
3. Majority of the libraries are using antivirus software to protect information.
4. Almost of all the libraries well connected by computer systems. Libraries are using Automation software and CCTV.
5. 50% of Libraries are updating Antivirus software, 36% Libraries are using backup of data to secure information in libraries.
6. Majority of the Libraries are facing Financial Problems, Budget allocation from Government from time to time.

Conclusion and Suggestions

The study concludes that Government Degree College libraries need to adopt the latest technologies in there libraries to save the time of the reader in disseminating the information. All the Government Degree College librarians and library staff need sufficient training programmes to update their knowledge. Almost all the Government Degree College Libraries are facing lack of manpower out of 136 colleges only 42 regular Librarians are working in GDC's of telengana state. All the other libraries are maintained by In-charges. There is an urgent need to recruit

the librarian posts in the Government Degree College Libraries of Telangana State for smooth functioning of Higher Education.

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Specialised Library Services and activities for Enhancement of Quality Results: A study with reference to KV Bilaspur

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Abstract: The present research paper reveals the enhancement of quality oriented output by means of Library , its resources and specialised services in a hybrid way. The paper emphasized use of specialized services of Library Media Centre such as CAS, SDI and other specialised activities. The data have been analyzed and presented in the form of table and 2-D Columns. User's feedback from teachers, students on the execution of these specialised services has been appended. The present research paper is based on functioning of specialised services and activities of Kendriya Vidyalaya Bilaspur. Results and findings have been explained.

Key Words: Kendriya Vidyalaya, Library Media Centre, Library Sources, Library Specialised Services, Current Awareness Services, Selective Dissemination of Information, Quality Output, Library 2.0 Tools, Annual Library Activity Plan, e-granthalaya, Information Communication Technology, Read-A-Thon, Digistories

Introduction

"A library is not a building stacked with books – it is a repository and source of information and ideas, a place for learning and enquiry, and for the generation of thought and the creation of new knowledge."

–National Knowledge Commission, 2005

Specialised Services and activities of KV Bilaspur

(i) CAS
(ii) SDI
(iii) ICT based Service
(iv) Library 2.0 tools such as web bl;ogs and e-newsletter
(v) ALAP
(vi) Green Day-Pustakophar
(vii) Read-a-Thon
(viii) Making Book Buddies
(ix) Audio Reader
(x) Students creativity
(xi) Book Talk
(xii) Glad Book Sad Book
(xiii) Reader's Theatre
(xiv) Book Buffet
(xv) Whisper a story
(xvi) Headline Grabber
(xvii) Article Index
(xviii) Digistories
(xix) New Ending
(xx) Event Timeline
(xxi) National Reading Day and Reading Month

Objectives of the Specilised Library Services (Source – KVS Library Guidelines)

- Supporting and enhancing educational goals as outlined in Kendriya Vidyalaya Sangathan's mission and curriculum.
- Be the knowledge hub of the school and disseminate knowledge as widely as possible.
- Provide a curriculum-based, flexibly scheduled, open access learning environment that accommodates all learners.
- Facilitate creation of new knowledge.
- Facilitate optimal use of knowledge by all staff and students.

- Encourage and foster reading habit among staff and students.
- Effectively participate in the teaching-learning programmes of the school.
- To provide intellectual access to information through learning activities that are integrated into the curriculum and that help all students achieve information literacy

Objective of the Study

The present work dealt with the enhancement of qualities using Library Media Centre and its existing resources and specialised services. The major objectives of the present work are as follows:

1. To find out the various Resources and Specialised Services and activities of LMC of KV Bilaspur
2. To find out the enhancement of Quality Education and Quality Results from these Specialised Sources, Services, activities
3. To find out the present status of creation of Library 2.0
4. To find out the status of optimum utilization of available resources
5. To find out the satisfaction level and promotion of reading habits among students.

Hypothesis of the Study

The major hypotheses formed with the help of review of literature are as follows:

1. The majority of the students, teachers are using existing facilities of their school media library and its specialised services
2. There is significant relationship between the students, Teachers and their willingness to attend library media centre for various sources and services of the LMC.
3. Great impact of Library 2.0 tools on LMC resources and services
4. Impact and significant relationship of Library Media resources and services on enhancement of quality education and quality results
5. Library Sources and Services enable students to promote their reading habits

Research Methodology

It has been found suitable Questionnaire Survey Research Method and telephonic interview to collect the data for the present work "Specialised Library Services and activities for Enhancement of Quality Results: A study with reference to KV Bilaspur" This study involves LMC Head, 40 Teachers and 105 students from KV Bilaspur. This study involves proper adoption of research design, tools, test, and collection of sufficient samples by opting appropriate sampling techniques, careful tabulation of data and use of proper data analysis techniques.

Variable

The below mentioned variables identified for the present research work:

(i) LMC Head- 01
(ii) Teachers -40
(iii) Students -105
(iv) Library 2.0
(v) Quality Education
(vi) Quality Results
(vii) LMC Resources and Specialised services
(viii) ALAP

Survey & Sample Population

The research work covered its LMC Head and 40 teachers, 105 students of KV Bilaspur as per the details given below.

Table 1: Questionnaire and Interview statistics

Respondents	Questionnaire sent	Questionnaire received	Questionnaire received (%)
Librarians	01	01	100
Teachers	40	40	100
Students	110	105	95.45

Data Analysis and Interpretation

Year of establishment and sector wise distribution of Kendriya Vidyalayas under KV Bilaspur Cluster

Table 2: Year of establishment and sector wise distribution of Kendriya Vidyalayas Bilaspur

Sl. No.	Name of KV	Establishment Year	Sector	Library resources and Services (Yes/No)
01	KV Bilaspur	1986	Civil	Yes

Table 3: Collection Development

Collection Types	Numbers
Books,	12500
Magazines	36
Journals	11
Non Print Media	CDs

Table 4: Measures to procure resources of library

Measures to procure resources of library- LMC Head Response (in %)

Measures	To large extent	To some extent	Not at all
NCERT BASED	100	0	0
KVS BASED	100	0	0
PUBLISHER'S CATALOGUE	-	100	0
BOOK EXHIBITION	100	0	0
BOOK SHOPS	100	-	0
ON-LINE PROCUREMENT	-	100	0

Table 5: Specialised Services - CAS

Specialised Services – CAS & SDI			
Users	**Effective**	**Not effective**	**Not utilised**
Teachers	37(92.5%)	0	3(7.5%)
Students	89(84.76%)	0	16(15.23%)

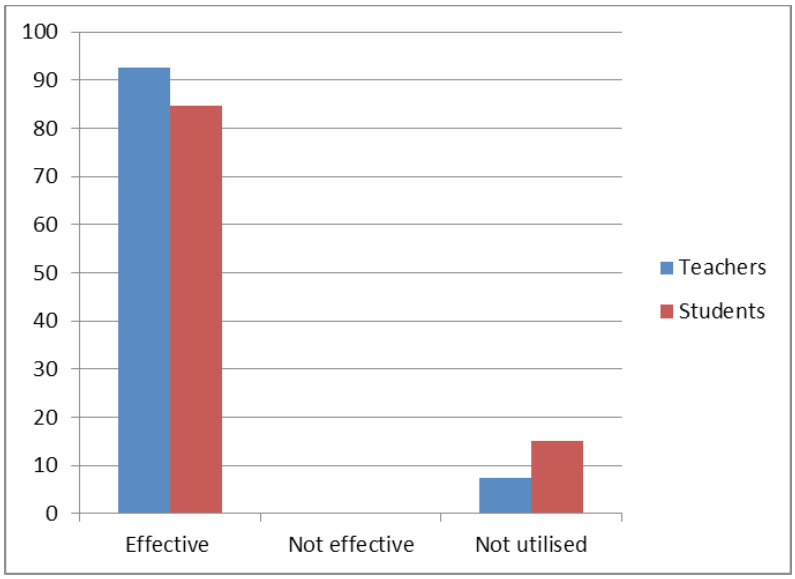


Fig 1 Specialised Services – CAS, SDI and Users Response

Effective use of Library Media Services to enhance quality education and quality results

Table 6: Library Media Services by Librarian to enhance quality education and quality results

Library Media Services	Students		Teachers	
	Effective	Less Effective	Effective	Less Effective
Circulation	105	0	40	00
Reference	105	0	40	00
Books and Magazines Reviews	101	04	32	08
Referral	105	00	38	02
Green Day – Reuse of Books	105	00	40	00
Students Creativity	105	00	38	02
Headline Grabber	98	7	34	06
Online access to desired materials - Net based Services	**102**	**03**	**40**	**00**
Library Orientation	105	00	40	00
Newspaper Clipping	96	09	38	02
Abstracting and Indexing	94	11	36	04

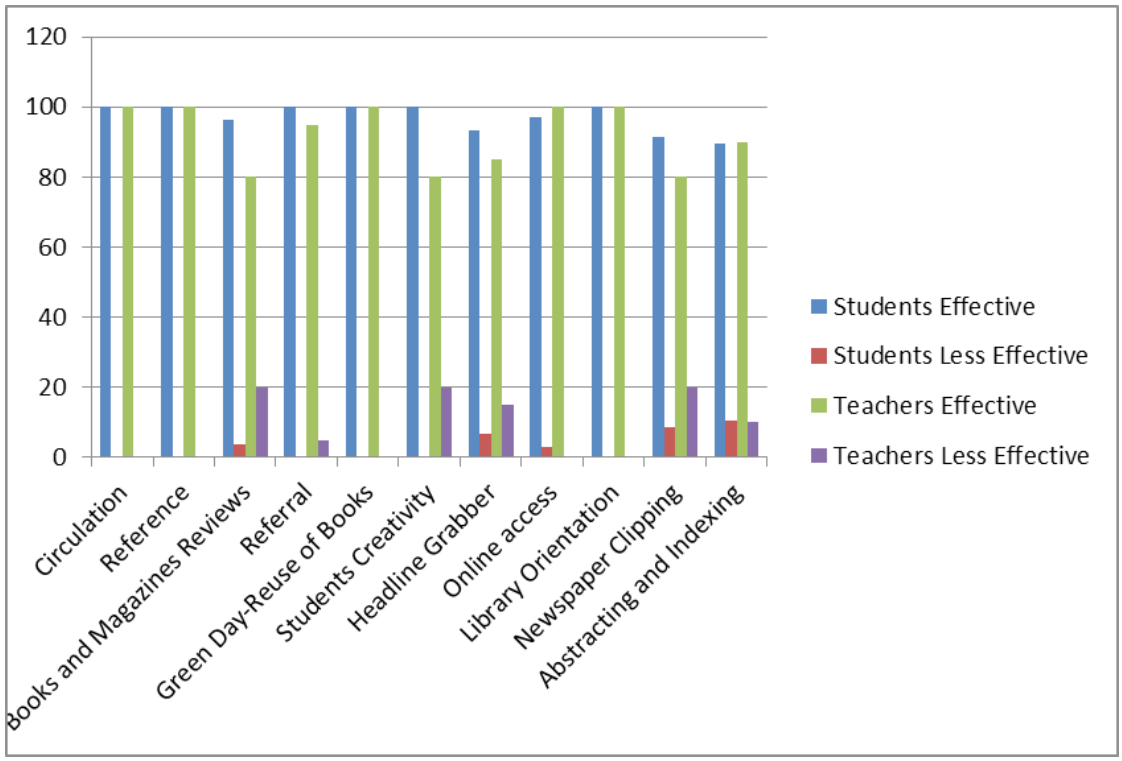


Fig. 2 .: Library Media Services by Librarian to enhance quality education and quality results

Table 7: Purpose of providing Internet facility

8 Purpose of providing Internet facility- Teachers Response

Sl. No.	Purpose	Yes	No
01	To access and retrieve additional subject materials	40	00
02	To access sample papers	38	02
03	To access split up of syllabus and CBSE Curriculum	40	40
04	To accomplish Project and assignments	34	06
05	For online quizzing	28	12
06	To access Library catalogue	40	00

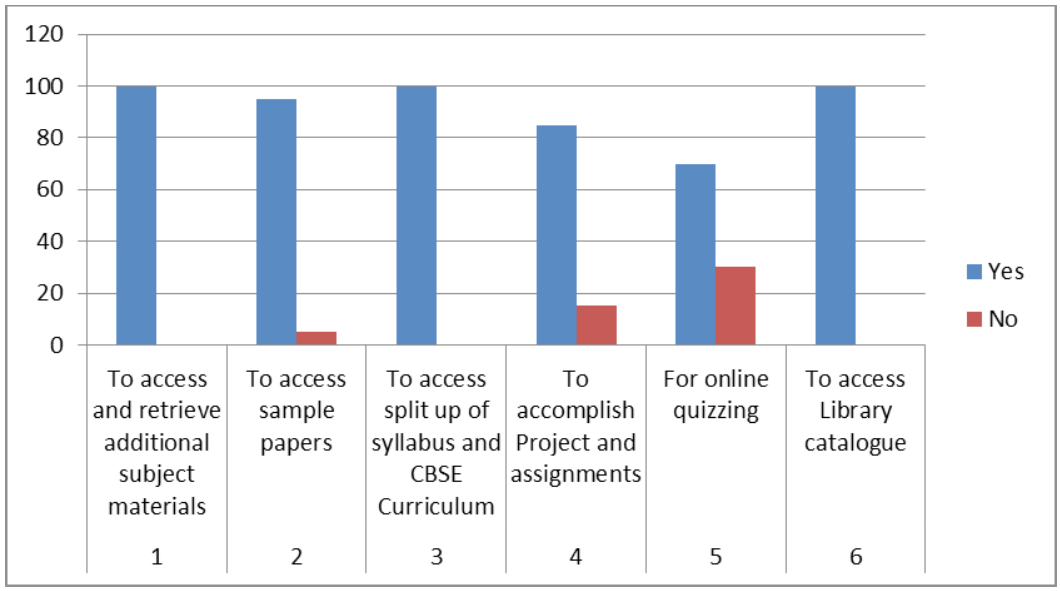


Fig 3. Internet utilities- Teachers response

Table 8: Existence of Library Software

Existence of Library Software- Librarian's Response

Sl. No.	Existence of Library Software	Yes (%)	No (%)
01	Library Software e-granthalaya for Library Automation	1(100%)	00
02	Is library software "e-granthalaya"	1 (100%)	00
03	Library Automation completed with bar coding	1 (100%)	00

Table 9: Existence of Green Library as per KVS Guidelines

Existence of Green Library as per KVS Guidelines – Librarian's Response (Yes/No)

Green Library	Whether Green Library is exiting (Yes)	Whether Green Library is exiting (No)
Green Library – A concept to minimize negative impact)	1 (100%)	00

Table 10: Measures for Interpersonal relationships and their willingness to attend library periods for various activities, sources and services of library

Measures for Interpersonal relationships and their willingness to attend library periods for various activities, sources and services of library- User's Response

Interpersonal Relationship	Interpersonal Relationship Measures taken (Yes in %)	Interpersonal Relationship Measures taken (No in %)
Teachers	40(100%)	00
Students	105 (100%)	00

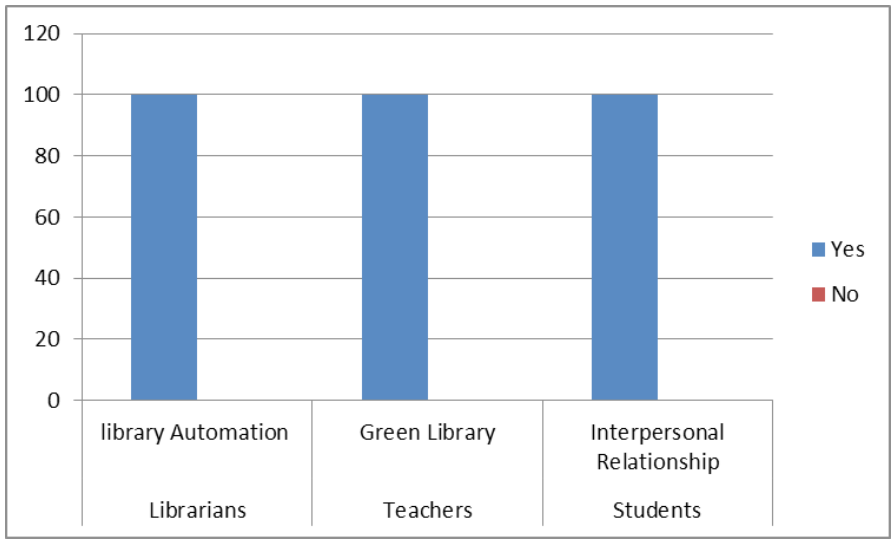


Fig 4. indicates the measures have been undertaken on Interpersonal relationships along with Status of Library Automation, Green Library qualitatively. Their responses were 100%.

Table 11: Annual Library Activity Plan (ALAP)

Annual Library Activity Plan (ALAP)

ALAP AS PER KVS POLICY & GUIDELINES	ALAP (Yes in %)	ALAP (No in %)
Librarian	1 (100%)	00

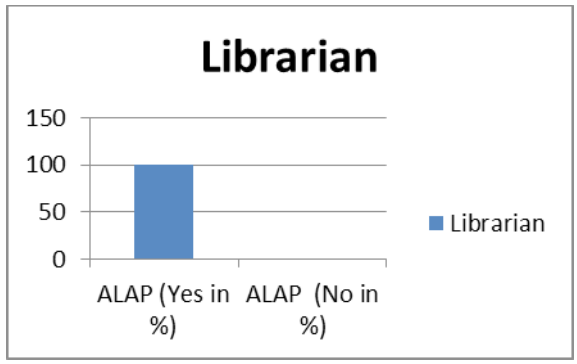


Fig. 5 "Annual Library Activity Plan " LMC

Table 12: Library activities planned to create new knowledge and generation of thought, source of information and place for learning and response

Library activities planned to create new knowledge and generation of thought, source of information and place for learning

Library activities for creating New Knowledge	Strongly agreed	Partially agreed	Not agreed
Librarian	1 (100%)	00	00
Teachers	32	8	00
Students	98	7	00

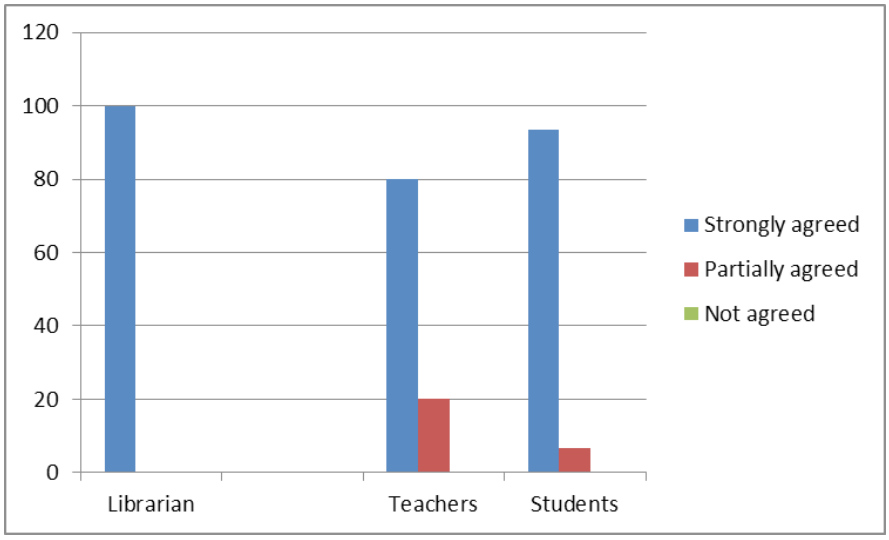


Fig. 6. Library activities planned to create new knowledge and generation of thought, source of information and place for learning and response

Table 13: Enhancement of Quality due to LMC Specialised Resources and services

Enhancement of Quality Results of Students by using Specialised Services (Response as Outstanding, Excellent, Very Good, Average, Poor)

Response	Librarian	Teachers	Students
Outstanding	01	34	87
Excellent	00	04	12
Very Good	00	02	06
Average	NIL	NIL	NIL
Poor	NIL	NIL	NIL

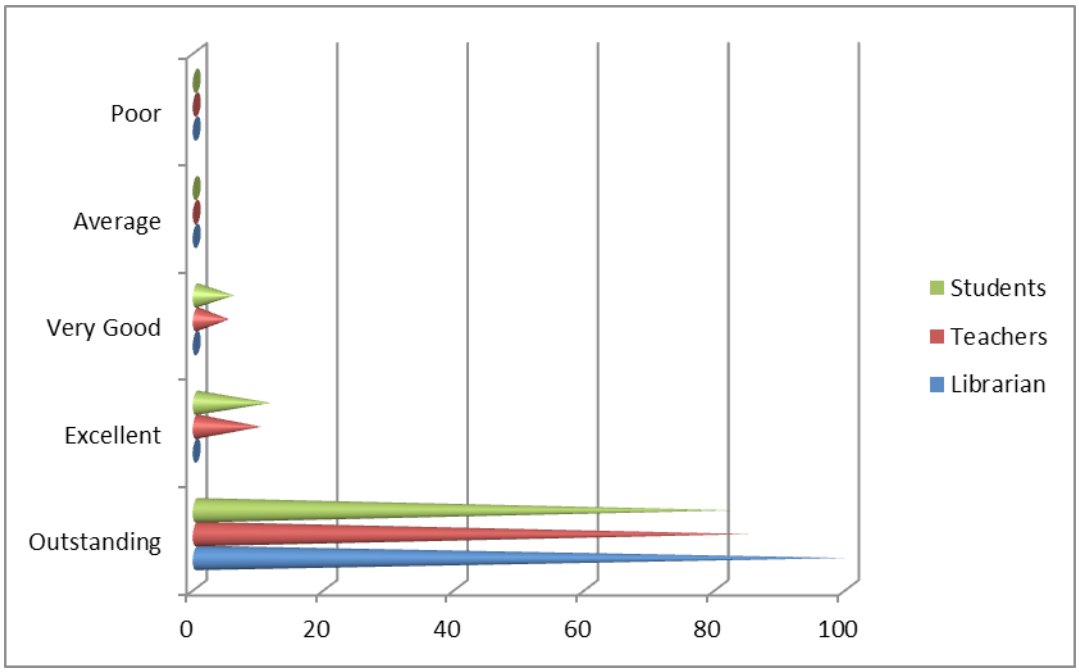


Fig.7 : Enhancement of Quality due to LMC Specialised Resources and services Ranking of Library 2.0 specialised activities (E = Excellent, VG = Very Good, G = Good, AV= Average)

Table 14 shows that majority of respondents agreed upon library 2.0 based services subsequently users are accessing desired demand of information very quickly, pin pointedly, comprehensively enhancing the quality in many aspects.

Sl. No.	Services	KV Bilaspur
01	Library web blogs	E
02	e-newsletter	VG
03	Internet based services	VG
04	Specialized Services	E

Table 15: Specialised other activities for enhancement of quality results and quality education

Specialised other activities for enhancement of quality results and quality education

Students Response - Very Effective (in %)		**Less Effective**	**Unawre**
(i) Read-a-Thon	92	8	0
(ii) Making Book Buddies	91	9	0
(iii) Audio Reader	84	16	0
(iv) Students creativity	100	0	0
(v) Book Talk	98	2	0
(vi) Glad Book Sad Book	97	3	0
(vii) Reader's Theatre	92	8	0
(viii) Book Buffet	89	11	0
(ix) Whisper a story	87	13	0
(x) Headline Grabber	92	8	0
(xi) Article Index	98	2	0
(xii) Digistories	82	18	0
(xiii) New Ending	81	19	0
(xiv) Event Timeline	93	7	0
(xv) National Reading Day and Reading Month	100	0	0

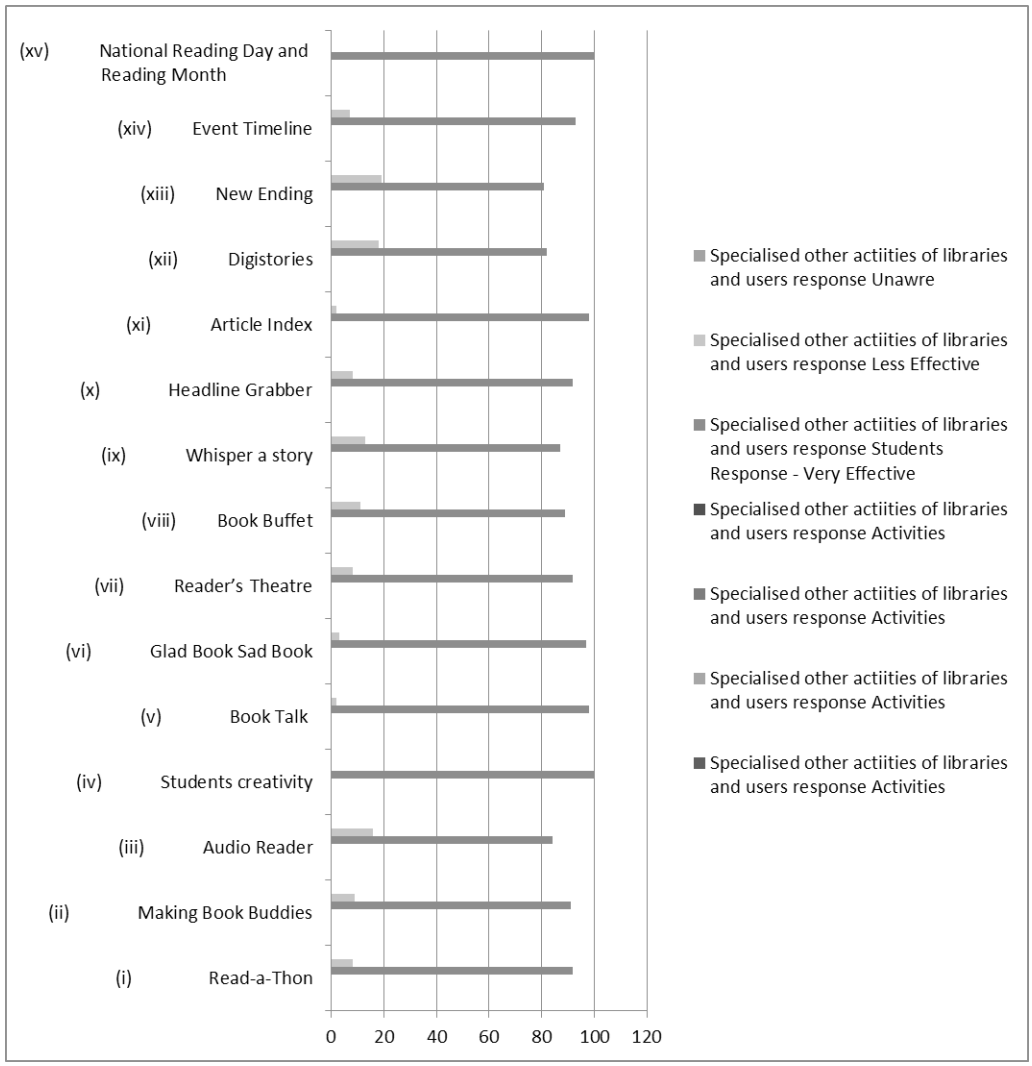


Fig. 8: Other Specialised activities of Library for the enhancement of Quality

Findings

Table 16 shows the results of students with quality in Academic Session 2018-19

Respondents	Results with Quality					
	Class X Board	Class XII Board				
Librarians	100%	100%				
Teachers	100%	100%				

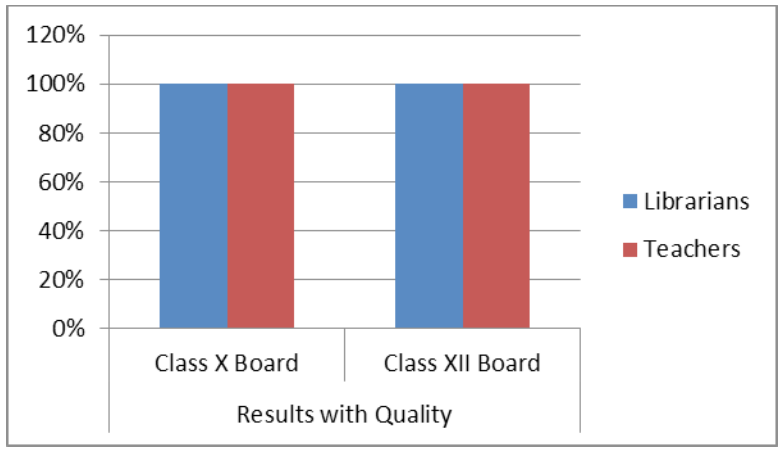


Fig. 9: indicated the 100% results of Board Classes in Academic Session 2018-19

Table 17: Promotion of Reading habits through specialised services and activities of library

Promotion of Reading habits through specialised services and activities of library

Respondents	Yes improved	To some extent	Not improved
Librarian	1(100%)	00	00
Teachers	40 (100%)	00	00
Students	102 (97.14%)	03 (2.85%)	00

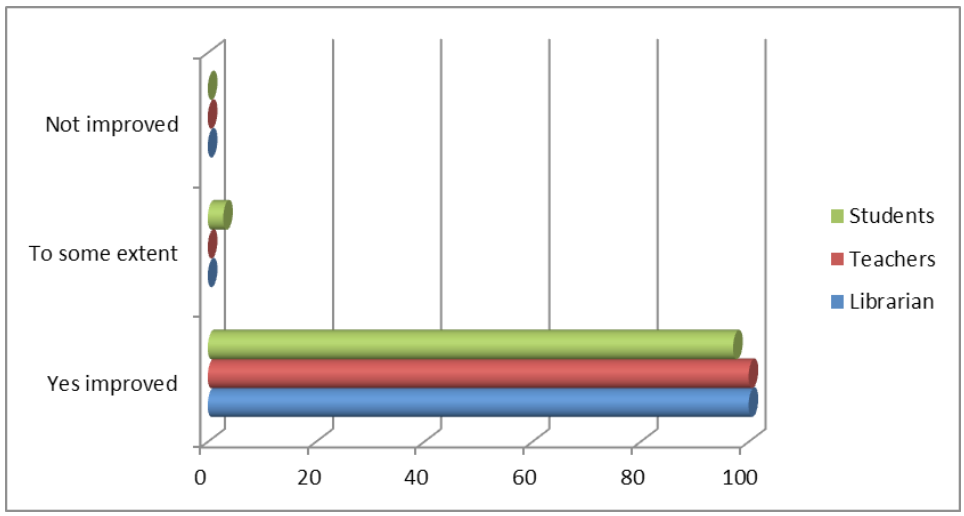


Fig. 10: Promotion of Reading habits through specialised services and activities of library

Library specialized activities are provided from primary, secondary, tertiary speialised sources of LMC. Library 2.0 has been the recent prominent features. They are also executing the specialized services such as CAS, SDI, Bibliographic searches besides regular routine services. These specialized services are executingin a hybrid ways. They have unique Library Management Software called "e-granthalaya" of NIC New Delhi. These helped students and teachers to access the desired information and same time they show their remarkable achievement through this newly added service. This helped to enhance the quality aspect of services and results of vidyalayas. Quality procurement of library resources and subsequently planning and execution of library media services play very prominent role to enhance quality education as well as quality results. These services enable modern day's school libraries to serve qualitatively to their users using these resources and services. Recent inclusion of library 2.0 seems to have entirely changed the scenario of modern day's school libraries of Kendriya Vidyalayas. It has become an integral part of all the library resources along with services. In this context policy of KVS Library suggests library as "Library Media Centre (LMC)" and Librarian as "Teacher Librarian". This has become possible mainly due to optimum utilization of library resources and services in a meaningful way. The LMC executes the Library Celebrations such as "National Reading Month" from 19th June to 18th July, "Librarian's Day" on 12th August and "Library Week" from November 14-20 every year and assisting the various events and celebrations of the vidyalayas actively.

Suggestions

The librariy need to strengthen the staffing, which does not exist. The networking of the cluster libraries will enable the services like resource sharing and can save time and money. Though library of KV Bilaspur is resourceful and executing the specialised services quite effectively , through implementation of networking among cluster libraries qulity will further be strengthened.

Conclusion

The quality aspect whether it is in terms of education or results of students, it is clear from this research survey study that "Library Media Centre being the hub and nerve centre" of vidyalaya has very prominent role to play. This role can easily be achieved by using these specialised activities and services, resources of the nerve centre with ease. Needless to mention and as per the study it helps tremendously to promote the reading habits. Their proper and timely execution yield qualities.

The schools LMC are covering a wide range of specialised activities and are main role player in achieving the mission and vision of the school. They are aiming to serve all potential users within the school community and meet the particular needs of different target groups.

Hence, as data analysis reveals these specialised resources and services of of Kendriya Vidyalaya Bilaspur helps greatly to enhance the quality aspects in education and as well as in the results of students.

Abbreviation

1. KV – Kendriya Vidyalaya
2. CAS – Current Awareness Service
3. SDI – Selective Dissemination of Services
4. ICT – Information Communication Technology
5. VMC – Vidyalaya Management Committee
6. LMC – Library Media Centre
7. NKC – National Knowledge Commission
8. Eg 3 – e-granthalaya Version 3
9. OPAC – Online Public Access Catalogue
10. NIC – National Informatics Centre
11. ALAP – Annual Library Activity Plan
12. NKC – National Knowledge Commission

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Online Resources for Teacher Education

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Abstract: The digitally divide environment insist National Agencies to improve our systems to compete the systems established in the developed countries.NCTE, NCERT, NUEPA, Ministry of MHRD ,Private Educational Agencies, Corporate and some NGO's contributing to develop own digital resources, but the lacking of awareness researchers could not find required information in time .Use of ICT improve our traditional systems and the result of improvement change the scenario of easily availability of information on line with 24/7accesibility

Keyword:

1. Introduction

Globalization makes a global village due to using only an advance communication technology transferring information from a corner to another corner of the world within a second with the help of high speed networks. In our country some national important agencies take an initiative to develop a world class digital archive, networks, databases to face the digital divide problem raised by the globalization

The education faculty and the researcher in the subject of Education and Teacher Education always facing a problem of real time data unavailability digital resources meet their needs up to some extent. Our indigenous e-resources were in the pipeline of development but some are getting shape they are as follows

2. National Council of Teacher Education (NCTE)

In the year 2020 in COVID-19 Pandemic situation NCTE has constituted a committee under the chairmanship of Prof. Saroj Sharma to obtain and curate open educational resources in the field of Teacher Education. The Committee has done very good job and available the freely accessible quality open educational resources for the use of student-teacher and the educators in the country. The Committee has indentified 29 core courses in teacher education. The Committee has not only insist to develop the online resources but also urge the various institution & subject experts to submit there e-content after peer reviewing each content by eminent experts. The grouped all these open educational resources in

the category.

1. OER Develop
2. OER Curated
3. OER by Institution and Academic groups

The open educational resources develop by NCTE is available on following website. http://ncte.gov.in/website/OER

3. Teacher Education in India

National Council of Educational Research and Training
www.ncert.nic.in

It is an official website of National Council of Educational Research and Training. working as National Nodal agency for making Primary and Secondary Education Policy, Implementation and Evaluation The website provides the authentic information about their programmes and schemes like as National Policy on Education 1986 and modified in 1992 available on the website and other programme run and administered by NCERT National Talent Search Examination Education Survey, The National Achievement Survey, Publication of Textbooks Reports ,Journals are routine work of NCERT

National Education Survey
http://www.ncert.nic.in/programmes/education_survey

NCERT conducted the education survey time to time to know the status and factual condition of education system in the country. In the survey main area of collection of data are as schooling facility in Rural and Urban area, physical facilities in the schools, Enrollment of students, Teachers and teacher ratio etc. and Manual on statistical and indicators of school, Atlas on school education these type of statistical data collected and presented statewise in each survey. Up to day the eight Educational Survey successfully conducted by the NCERT and the data available on the official website of NCERT.

National Achivment Survey
http://www.ncert.nic.in/programmes/NAS/NAS.html

The National Achievement Survey also conducted by NCERT to know the goals set by policy makers is it achieved are not. The Achievement Survey's conclusion presented statewise on the website.

E-Journals
http://www.ncert.nic.in/publication/journals/journals.html

NCERT published seven esteem journals in printed format as well as soft copy. The current issue of each journal were placed on website. The journals are as Prathmik Shikshak (Hindi),The Primary Teacher, Indian Education Review, School Science, Journal of Indian Education, Bharteeya Adhunik Shiksha(Hindi), Voices of Teachers and Teacher Educators.

E-Books
http://www.ncert.nic.in/NCERT/textbook/textbook.htm

NCERT play a key role to frame Primary and Secondary School Curriculum and compile textbooks on framed curriculum from standard I to XII. The text-books mainly published in English, Hindi ,and Urdu medium it is full text freely available on the website with a downloading facility.

National Repository of Open Educational Resources NROER
http://nroer.gov.in/home/

The National Repository of Open Educational Resources jointly created by The Department of School Education and Literacy, Ministry of Human Resources Development, Government of India, The Central Institute of Educational Technology and National Council of Educational Research and Training. The repository belongs to all of us anyone can participate, contribute, create and organize resources and activities, growing it to reach each every teacher and students in any language. The resource library in repository is categorized in Videos, Audios, Interactive, Images, and Documents with giving us the permission to Use, Comment, Critique, Create, Contribute and enrich. It helps to our Teachers, Students and Educational Researchers, Policy Makers, Management etc. in the process of teaching and learning.

National University of Educational Planning and Administration
http//www.nuepa.org/

National University of Educational Planning and Administration is another national agency to work mainly on Planning and Management of Education in the country. The official website of NUEPA provide very valuable information like as On going Training programme, Ongoing research projects as well as completed projects, Projects conducted by NUEPA, Publications as reports, Newsletter, Journals etc. The journal of NUEPA named as PARIPREKSHYA in hindi and journal

of Educational Planning and Administration in English available online with back issues freely on website.

Digital Archive of Education Document
http://www.nuepa.org/archives/index.html

The digital repository of Education Documents being develop and hosted by National University of Educational Planning and Administration. The depository plans to includes each and every document published on education by government. The depository includes Acts, Bills, Circulars, Resolutions, Recommendations, Court Orders, Educational Statistics, Guidelines, Educational schemes, Plans, Policies, Reports, Commissions Reports, Committees Reports, Right To Education etc. archive provides full text access to all education documents under one roof. The documents in the digital archive will be accessible to all users through internet. The documents full text freely available by registering themselves on website.

Digital archive of Education Documents would be a major source for educational research in all aspect, and levels9Primary Secondary and senior Secondary) of education system . It would be authentic source of information.

E-Journal of All India Association for Educational Research

www.aiaer.net/e-journal

The Educational Research e-journal freely available on their respective website on internet as a open source with the archive of back issues. Printed copy made available on demand of members only.

The main feature of of the website is to provide a link to other near about 250 e-journals available globaly with clicking on their address bar only. All e-journals freely full text available on internet.It is a vast collection of e-journals availabile to the researchers, students,teachers etc of the Education and Teacher Education subjects.

Prishikshak The Teacher Education Portal

Prashikshak the teacher education portal for District Institutes of Education and Training (DIET) will be launched recently on 30th June ,2016 The objective of Prashikshak is to help DIETs make informed decisions about their institutes, compare the performance of their institute against other DIETs in the state/ country as well as help aspiring teachers make informed decisions about which institutes to join. Prashikshak Portal has been developed by the Ministry of HRD in collaboration with Central Square Foundation.

Prashikshak is a unique IT Initiative taken by HRD Ministry which would entail the establishment of a strong monitoring mechanism with a database of teacher education institutes with all relevant performance indicator.

The major users of Prishikshak will be pre-service teacher educators, DIET principals and faculty, Policy makers at District, State Government and National Level and the General Public.

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Data Analysis Methods, Tools and Techniques In Research.

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Abstract: The explanation of how one carried out the data analysis process in research is an area that in sadly neglected by many researchers. This paper presents a variety of data analysis methods, tools and techniques described by various researchers. Data analytics is the process of analyzing raw data to draw out meaningful insights. Ultimately, data analytics is a crucial driver of any successful research. But how do data analysts actually turn raw data into something useful. In this paperexplore some of the most useful methods of data analysis and how to use data analysistechniques and tools to produce analytical results that are error free and reproducible.

Keywords: Data Analysis, Methods, Tools and Techniques, Research.

1. Introduction

Data analysis is a process used by researchers for reducing data to a story and interpreting it to derive insights. The data analysis process helps in reducing a large chunk of data into smaller fragments, which makes sense. The systematic application of statistical and logical techniques to describe the data scope, modularize the data structure, condense the data representation, illustrate via images, tables, and graphs, and evaluate statistical inclinations, probability data,

to derive meaningful conclusions, is known as Data Analysis.

Three essential things take place during the data analysis process the first data organization. Summarization and categorization together contribute to becoming the second known method used for data reduction. It helps in finding patterns and themes in the data for easy identification and linking. Third and the last way is data analysis. Marshall and Rossman, on the other hand, describe data analysis as a messy, ambiguous, and time-consuming, but a creative and fascinating process through which a mass of collected data is being brought to order, structure and meaning.It can say that "the data analysis and interpretation is a process representing the application of deductive and inductive logic to the research and data analysis."

Why data analysis is important in research?

In research, researchers rely heavily on data as they have a story to tell or problems to solve. It starts with a question, and data is nothing but an answer to that question. But, what if there is no question to ask. It is possible to explore data even without a problem. it is called 'Data Mining' which often reveal some interesting patterns within the data that are worth exploring.

Irrelevant to the type of data, researchers explore, their mission, and audiences' vision guide them to find the patterns to shape the story they want to tell. One of the required things expected from researchers while analyzing data is to stay open and remain unbiased towards unexpected patterns, expressions, and results. Remember, sometimes, data analysis tells the most unforeseen yet exciting stories that were not expected at the time of initiating data analysis.

Data analysis is a process used to transform, remodel and revise certain information with a view to reach to a certain conclusion for a given situation or problem. Data analysis can be done by different methods a according to the needs and requirements of different domains like business, social science, science and social science.Data analysis, in research supports the researcher to reach to a conclusion. Therefore, simply stating that data analysis is important for a research will be an understatement rather no research can sustain without data analysis.

2. Data Analysis Methods

Qualitative data: Those data that can be observed and recorded and non-

numerical in nature is known as qualitative data. When the data presented has words and descriptions, then we call it qualitative data.As said by **essay deutsch** it allows respondents to express his/her views fully in a contextual manner. It offers dynamic approaches; generate valuable conversation over a particular subject. This is specifically used for conducting marketing and consumer research, for instance, if a new brand is accepting by consumers or not. To know the answer, a researcher use qualitative approach to gather information about consumer experiences and their feedbacks.This type of data is usually collected through focus groups, personal interviews, or using open-ended questions in surveys.

Quantitative Data:Any data expressed in numbers of numerical figures are called quantitative data. This type of data can be distinguished into categories, grouped, measured, calculated, or ranked. Some examples of quantitative data are height, class interval, length of a wall, number of peoples, percentage of marks etc. Questions such as age, rank, cost, length, weight, scores, etc. everything comes under this type of data. Researcher can present such data in graphical format, charts, or apply statistical analysis methods to this data. The Outcomes Measurement Systems questionnaires in surveys are a significant source of collecting numeric data.

Categorical Data: It is data presented in groups. However, an item included in the categorical data cannot belong to more than one group. A person responding to a survey by telling his smoking habit, living style, marital status, or drinking habit comes under the categorical data. A chi-square test is highly preferred by researchers to calculate categorical data sets.

Data Analysis Techniques

There are different techniques for Data Analysis depending upon the question at hand, the type of data, and the amount of data gathered. Each focuses on strategies of taking onto the new data, mining insights, and drilling down into the information to transform facts and figures into decision making parameters. Accordingly, the different techniques of data analysis can be categorized as follows:

1. Techniques based on Mathematics and Statistics

- **Descriptive Analysis**: Descriptive analyses complete data or a sample of summarized numerical data. It shows mean and deviation for continuous data whereas percentage and frequency for categorical data.Descriptive Analysis takes into account the historical data, Key Performance Indicators, and describes the performance based on a chosen benchmark. It takes

into account past trends and how they might influence future performance.

- **Regression Analysis**: This technique works by modeling the relationship between a dependent variable and one or more independent variables. Regression analysis allows modeling the relationship between a dependent variable and one or more independent variables. In data mining, this technique is used to predict the values, given a particular dataset. For example, regression might be used to predict the price of a product, when taking into consideration other variables. Regression is one of the most popular types of data analysis methods used in business, data-driven marketing, financial forecasting, etc.There is a huge range of different types of regression models such as linear regression models, multiple regression, logistic regression, ridge regression, nonlinear regression, life data regression, and many others.
- **Dispersion Analysis**: Dispersion analysis is not a so common method used in data mining but still has a role there. Dispersion is the spread to which a set of data is stretched. It is a technique of describing how extended a set of data. The measure of dispersion helps data scientists to study the variability of the things.Generally, the dispersion has two matters: first, it represents the variation of the things among themselves, and second, it represents the variation around the average value. If the difference between the value and average is significant, then the dispersion is high. Otherwise, it is low.
- **Discriminant Analysis**: It is a classification technique in data mining. It identifies the different points on different groups based on variable measurements. In simple terms, it identifies what makes two groups different from one another; this helps to identify new items.
- **Factor Analysis**: This technique helps to determine if there exists any relationship between a set of variables. In this process, it reveals other factors or variables that describe the patterns in the relationship among the original variables. Factor Analysis leaps forward into useful clustering and classification procedures.

- **Time Series Analysis**: Time series analysis accounts for the fact that data points taken over time may have an internal. In this kind of analysis, measurements are spanned across time, which gives us a collection of organized data known as time-series.You know that, in almost every scientific area, measurements are executed over time. These look-outs lead to a collection of organized data known as time series. A good example of time series is the daily value of a stock market index. Time series data analysis is the process of modeling and explaining time-dependent series of data points. The goal is to draw all meaningful information (statistics, rules, and patterns) from the shape of data.

2. Techniques based on Artificial Intelligence and Machine Learning

- **Artificial Neural Networks:** a Neural network is a biologically-inspired programming paradigm that presents a brain metaphor for processing information. An Artificial Neural Network is a system that changes its structure based on information that flows through the network. ANN can accept noisy data and are highly accurate. They can be considered highly dependable in business classification and forecasting applications.
- **Evolutionary Programming**: This technique combines the different types of data analysis using evolutionary algorithms. It is a domain-independent technique, which can explore ample search space and manages attribute interaction very efficiently.
- **Fuzzy Logic**: It is a data analysis technique based on probability which helps in handling the uncertainties in data mining techniques.
- **Decision Trees**: As the name stands, it is a tree-shaped model that represents a classification or regression models. It divides a data set in smaller subsets simultaneously developing into a related decision tree.

3. Techniques based on Visualization and Graphs

- **Line Chart**: This chart is used to represent the change of data over a continuous interval of time.

- **Area Chart**: This concept is based on the line chart. It additionally fills the area between the polyline and the axis with color, thus representing better trend information.
- **Column Chart, Bar Chart**: Both these charts are used to present numerical differences between categories. The column chart takes to the height of the columns to reflect the differences. Axes interchange in the case of the bar chart.
- **Pie Chart**: It is used to represent the proportion of different classifications. It is only suitable for only one series of data. However, it can be made multi-layered to represent the proportion of data in different categories.
- **Funnel Chart**: This chart represents the proportion of each stage and reflects the size of each module. It helps in comparing rankings.
- **Word Cloud Chart:** It is a visual representation of text data. It requires a large amount of data, and the degree of discrimination needs to be high for users to perceive the most prominent one. It is not a very accurate analytical technique
- **Radar Chart**: It is used to compare multiple quantized charts. It represents which variables in the data have higher values and which have lower values. A radar chart is used for comparing classification and series along with proportional representation.
- **Gantt Chart**: It shows the actual timing and the progress of activity in comparison to the requirements.
- **Scatter Plot**: It shows the distribution of variables in the form of points over a rectangular coordinate system. The distribution in the data points can reveal the correlation between the variables.
- **Frame Diagram**: It is a visual representation of a hierarchy in the form of an inverted tree structure.
- **Bubble Chart**: It is a variation of the scatter plot. Here, in addition to the x and y coordinates, the area of the bubble represents the 3rd value.
- **Rectangular Tree Diagram**: This technique is used to represent hierarchi-

cal relationships but at the same level. It makes efficient use of space and represents the proportion represented by each rectangular area.

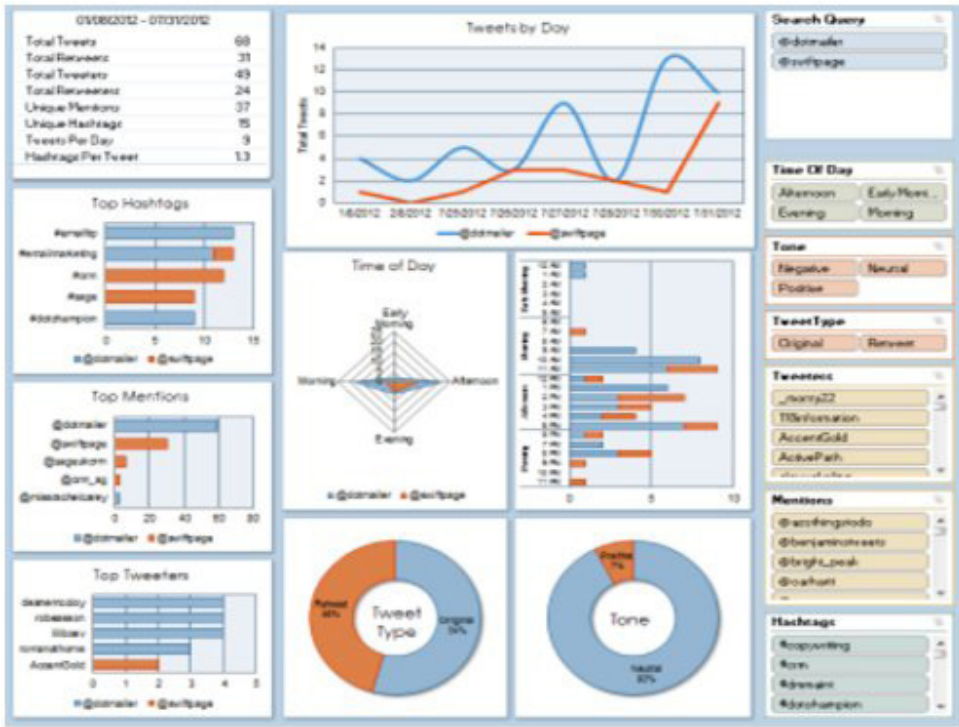
- **Map**
  - **Map:** It uses color to represent value distribution over a map partition.
  - **Point Map:** It represents the geographical distribution of data in the form of points on a geographical background. When the points are the same in size, it becomes meaningless for single data, but if the points are as a bubble, then it additionally represents the size of the data in each region.
  - **Heat Map**: This represents the weight of each point in a geographic area. The color here represents the density.
  - **Flow Map:** It represents the relationship between an inflow area and an outflow area. It represents a line connecting the geometric centers of gravity of the spatial elements. The use of dynamic flow lines helps reduce visual clutter.

3. Data Analysis Tools

There are several data analysis tools available in the market, each with its own set of functions. The selection of tools should always be based on the type of analysis performed, and the type of data worked. Here is a list of a few compelling tools for Data Analysis.

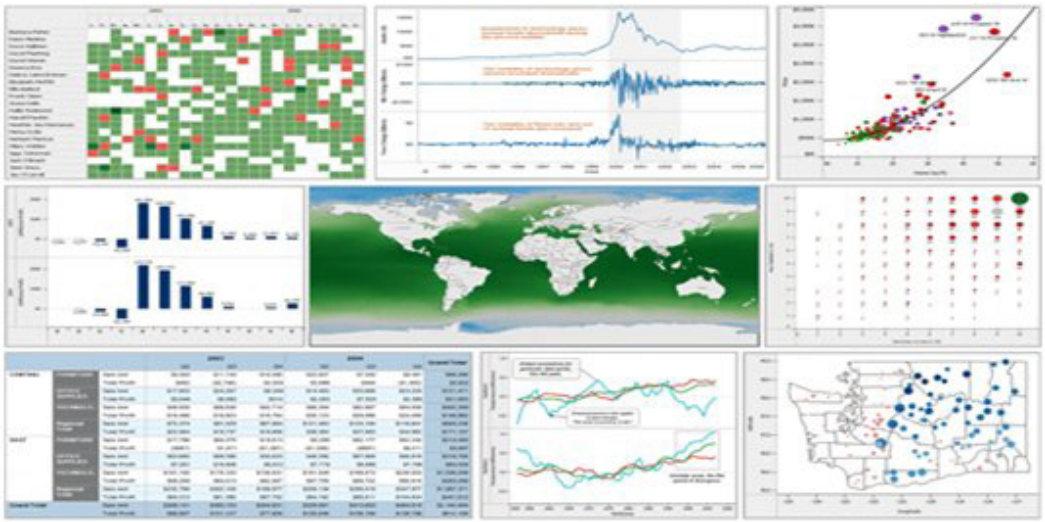
1. Excel

Excel is a basic, popular and widely used analytical tool almost in all industries as well as academic research. Excel becomes important when there is a requirement of analytics on the client's internal data. It analyzes the complex task that summarizes the data with a preview of pivot tables that helps in filtering the data as per client requirement. Excel has the advance business analytics option which helps in modeling capabilities which have prebuilt options like automatic relationship detection, a creation of DAX measures and time grouping.It has a variety of compelling features, and with additional plugins installed, it can handle a massive amount of data. So, if you have data that does not come near the significant data margin, then Excel can be a very versatile tool for data analysis.



2. Tableau

Tableau Public is a free software that connects any data source be it corporate Data Warehouse, Microsoft Excel or web-based data, and creates data visualizations, maps, dashboards etc. with real-time updates presenting on web. They can also be shared through social media or with the client. It allows the access to download the file in different formats. If researchers want to see the power of tableau, then they must have very good data source. Tableau's Big Data capabilities makes them important and one can analyze and visualize data better than any other data visualization software in the market.The essence of Tableau is the Pivot Table and Pivot Chart and works towards representing data in the most user-friendly way. It additionally has a data cleaning feature along with brilliant analytical functions.



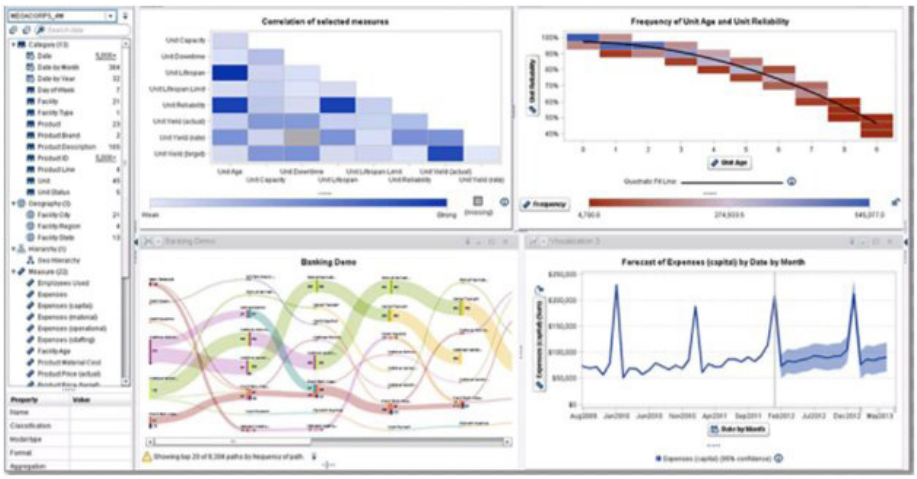
3. R Programming*(https://www.proschoolonline.com/blog/top-10-data-analytics-tools, 2021)*

These are programming languages which are very powerful and flexible. R is best at statistical analysis, such as normal distribution, cluster classification algorithms, and regression analysis. It also performs individual predictive analysis like customer behavior, his spend, items preferred by him based on his browsing history, and more. It also involves concepts of machine learning and artificial intelligence.



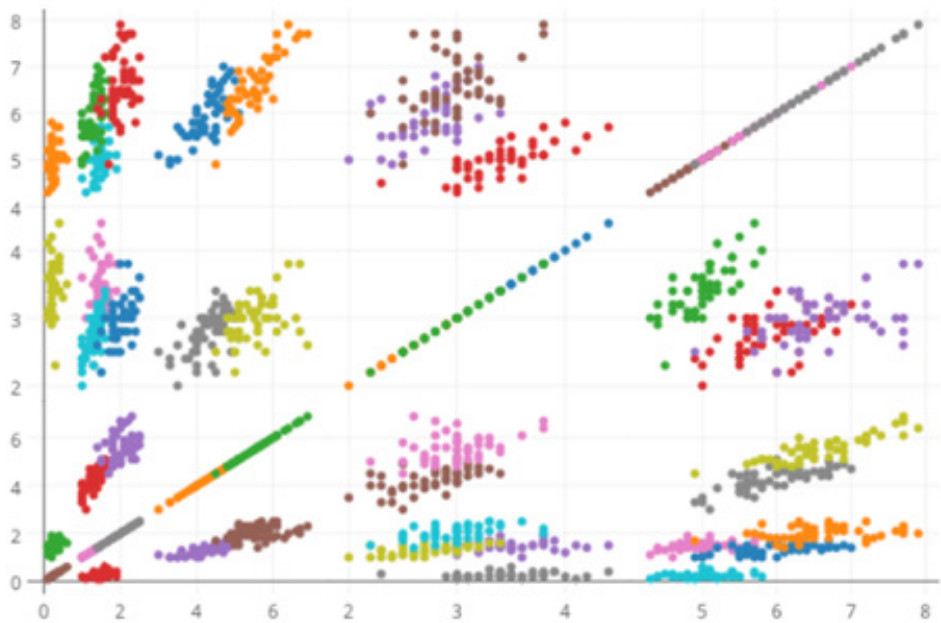
4. SAS

It is a programming language for data analytics and data manipulation, which can easily access data from any source. SAS has introduced a broad set of customer profiling products for web, social media, and marketing analytics. It can predict their behaviors, manage, and optimize communications.



5. Phython

Python is an object-oriented scripting language which is easy to read, write, maintain and is a free open source tool. which supports both functional and structured programming methods.Phython is easy to learn as it is very similar to JavaScript, Ruby, and PHP. Also, Python has very good machine learning libraries viz. Scikitlearn, Theano, Tensorflow and Keras. Another important feature of Python is that it can be assembled on any platform like SQL server, a MongoDB database or JSON. Python can also handle text data very well.



Conclusion

The process of analyzing data varies from one study to another, depending on how the researcher is guided by the research questions, the theoretical framework of the study. And the appropriateness of the techniquesfor making sense of the data. The purpose of analysis is to interpret and hence, convert the data into a story that describes the phenomenon or the participant's view. The process typically involves collecting data that will inform the study. Breaking downthe data into various categories and making connections between these categories in terms of relationship among them. While the discussions of data analysis, methods, techniques and tools provided in this article is by no means complete. It may provide novice researchers with some ideas for activities that will help them to begin analyzing data. Further it is my hope that veteran researchers will find such a review of techniques and tools useful for both conducting and teaching data analysis.

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Establishing Management Health Information Systems: A Potential Solution for Medical Information Explosion

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Abstract: The human capacity to manage and handle large numbers of statistics and to translate those statistics to information is limited to an extent. The demand for Information Scientists to manage data and statistics has been increasing exponentially. Information Science as a discipline has emerged as the confluence of multiple domains such as library science, computer science, statistics, data science, communication, and behavioural science. It comprises representation and analysis of information in natural as well as artificial systems. Information Science has various subfields; domain analysis is one of them. The rapid development of health informatics makes it essential for research scholars and healthcare professionals to be aware of current developments, emerging areas, core journals, authorship patterns, and trends. Creating a knowledge map for a particular domain is very essential for experts, newcomers, scholars, and policymakers. It would allow them to discover emerging trends and research areas.

Keywords: Health Informatics, Management Information Systems, Information Management, Health Data, Knowledge Mapping

1. Introduction

Sound and reliable information is the foundation of decision making process across all health systems building blocks. It is highly essential for health policy development and implementation, governance and regulation, health research, human resources development, health education and training, service delivery and financing.

Household surveys have become the primary source of data for developing countries as the health facility (hospitals) data is available of a limited quality. Household surveys mainly reflect individual beliefs, behaviours and practices. Data collected from hospital and institutional healthcare bodies also form the critical determinants of health status of a country.

There is a need for a comprehensive training database for large scale health data, healthcare information systems, and medical data exchange, initiatives have been taken by the government for shaping the future of public health, community health and healthcare delivery from a personal level to a system-level

A Health Information System can be understood as a system that integrates data collection, processing, reporting and use of necessary information for improving health services in an effective and efficient manner. Health Management Information Systems are "special systems which are designed to assist management and planning of health programmes." Health Management monitors the health status of the population.

The health information systems collects data from healthcare sectors, analysis the data and ensures the overall quality, relevance and timeliness and converts the data into information for health related decision making. The key functions of health information systems are-

1. Data generation
2. Data Compilation analysis and synthesis
3. Supports patient and health facility management
4. Global reporting and communication of health challenges to diverse users.
5. Trend Analysis
6. Stimulates research

Healthcare has experienced a rapid transformation through the advent of technology. It has evolved over time. The massive amounts of patient data and information explosion require the collection, storage, and retrieval of information in a systematic manner which led to the establishment of the field of health informatics. Information science professionals play an essential role in the preservation, tracking and sharing of medical information. Followed by security protocols to protect patient data

Health informatics discipline consists of the following areas-

Table 1: Broad and Narrow Areas of Health Informatics Domain

SN	Broad Areas of Health Informatics Discipline	Narrow Areas of Health Informatics Discipline
1	Development of Clinical Information Systems	Patient Data
2	Electronic Health Records	Personal Health record database
3	Clinical Diagnostic Systems	Diagnostics Database

SN	Broad Areas of Health Informatics Discipline	Narrow Areas of Health Informatics Discipline
4	Training and capacity building of health informatics professionals	Curriculum development, formal and informal education and practice
5	Research and Development into information modelling	Scholarly Communications in the field of health informatics
6	Framing well-defined framework and strategies	Policy frameworks and guidelines
7	Constructing Models for Health Informatics Systems	Data Analysis and retraction modelling
8	Drafting literature on Health Informatics	Research and dissemination of scholarly publications across healthcare professionals
9	Collaboration with experts and professionals	Capacity building programs
10	Clinical Informatics	Patient database and records
11	Pharmacy Informatics	Chemical compositions, formulae and catalogues
12	Informatics for education and research	Emerging research trends and forecasting trends
13	Customization of the Clinical Information Systems	Need based models and assessment to be carried out

The above represents the core areas of health informatics discipline which include the application of information systems, knowledge management principles, and clinical decision support systems. The major areas which the disciplines look upon comprise management information systems, emerging technologies, advanced statistics, and epidemiology. Thirteen broad areas have been covered which are further categorised into the narrower domains which come under them. Diverse areas ranging from clinical informatics to pharmacy informatics, training and capacity building in the field of health informatics research, development and dissemination of information across various sectors. Education and training stakeholders have been given utmost importance as they are the need of the hour. Followed by well-defined structured guidelines and framework for health informatics. Uniform standards need to be developed for easy interoperability and retrieval of records.

1.1 Subsystems of Health Management Information Systems

Health Management Information comprises of the following subsystems-

Table 1: Subsystems of Health Management Information Systems

SN	Components	Roles and Indicators
1	**Routine Service Reporting**	Hospital and Health centre based indicators
2	**Specific Program Reporting**	Programs and operations running in a particular country under various levels
3	**Epidemiological Surveillance**	Identification of diseases and risk factors, investigations and follow ups
4	**Vital Registrations**	Birth, Death, Migration
5	**Administrative Systems**	Accounts and financial systems Drug procurement, storage and delivery Personnel Management

Steps in Developing Health Management Information Systems

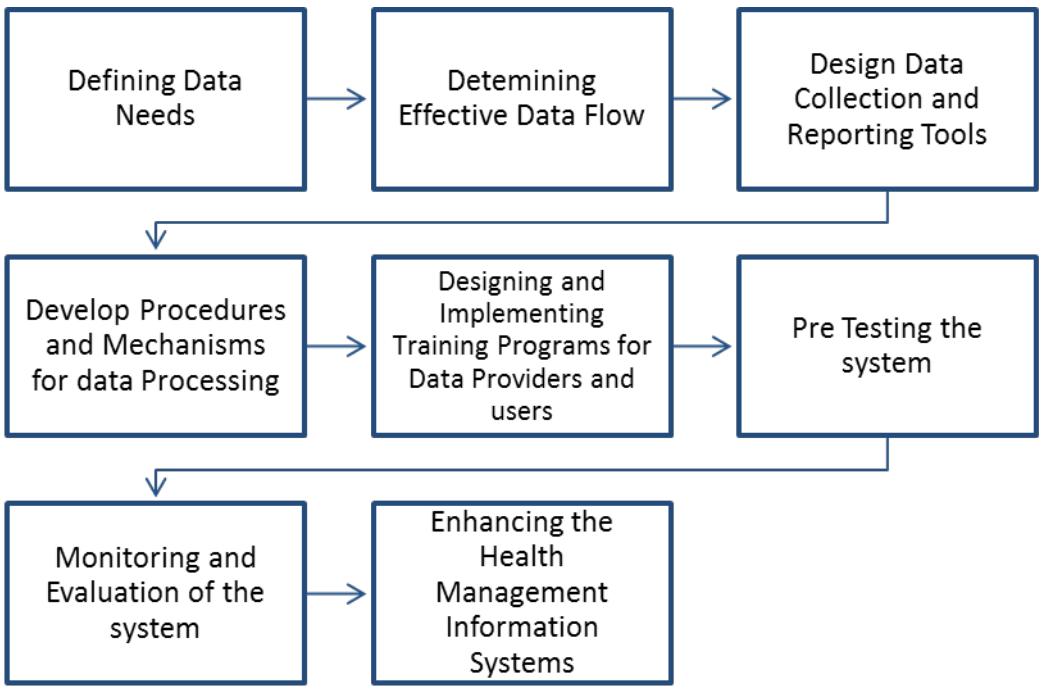


Figure 1: Steps in Health Management Information Systems

2.1 Defining Data Needs

Data needs vary at different administrative levels, data is not always generated through routine data collection methods. The functions also change invariably along with the needs at each level. The variables for each level need to be identified. The roles and functions of different units with respect to data generation and utilization to be well defined

2.3 Purpose of Country's Health Information System

The Health Information Serves multiple functions at various levels of the health system. Data from the different sources are used for multiple purposes at different levels of health care system which are as follows-

1. **Hospitals**

- The data from health facility levels enables health care managers to determine resources needs and can provide immediate information relevant to public health decision making. The data must be of high quality curated by following uniform standards and interoperable.

2. **Personal Data**

- Personal data includes patients profile, health care needs, treatment and form the basis for clinical decision making process. Well-coordinated sub systems should be deployed to manage individual level data.

3. **National Level Surveys**

- Data generated from National level surveys are the backbone to formulate national policies and frame works. Household surveys are the primary source of data for developing countries. Hospital level statistics are still of a limited quality which increases the gap between individual and institutional health sector.

4. **Public Health Data**

- Public Health data integrates information form facilities and communities and lays emphasis on defining problems and provides a basis for action especially in case of emergencies such as epidemic diseases.

3. Devices and Apps for Data Collection and Analysis

m-Health (mobile health or digital health) devices are being used to collect information for trials of specific devices. Research and development of more health devices for the purpose of monitoring and communication of health status Physician relationships to be established in association with the use of mobile/ web applications, association devices, trackers and sensors. Based on a survey conducted by the American Medical Association conducted in the year 2016. 31% of physicians claim that digital tools have the potential to improve patient safety, physician patient relationship, and improved diagnostic ability. (AMA, 2016) m-health comprises several approaches regarding personal networked devices and Applications to capture large corpora of data in order to improve artificial intelligence algorithms

4. Large Scale Health Data

In order to identify novel disease correlations and to match people to the best treatment based on specific health, life experiences, and genetic profiles systematically curated health data is required. Integration of all these data sources to develop medical breakthroughs and new insights on individual and public health. It also has to limit factors related to availability and accessibility of high data quality. Managing large scale health data requires the integration of data from various healthcare determinants. Such as family health surveys, census reports, heath, delivery data from hospitals and nursing homes, and genetics. Systematically curating extensive scale health data helps all the health care stakeholders to gain a complete picture of health scenarios and preparing for future needs and requirements.

4.1 All of Us Research Program- USA Based Model

All of Us Research Program is a project by the National Institute of Health, Precision Medicine Initiative. The primary goal of the program is to develop and collect a 1,000,000 person database of individuals across the country willing to share their biology, lifestyle, and environment data for research. The data collected in the initial survey collected data related to three significant domains are in the table below-

Large Scale Health Data: All of Us Research Data

- **Necessary information on medical history and lifestyle**
- (Personal habits and overall health)

- **Physical measurements:**
- Blood pressure, Pulse, Height, Weight and hip and waist circumference
- **Biosample assessments**:
- DNAtesting with additional participant consent Blood, urine samples and DNA testing with additional participant consent

The *All of Us Research Program* proposed to collect data continuously over ten years of the study. The primary purpose was to make data available to participants, researchers, and the public with the future goals of including all parts of electronic health records and data from wireless sensor technologies and geospatial environmental data. This approach makes it possible to create web services that can consolidate disparate pieces of data in one place and work well with the principle of sharing health data. (Derington, The Corporation, 2017)

5. Healthcare Information Systems and Medical Data Exchange

EHR: Electronic Health Record is an electronic version of a patient's medical history maintained by the healthcare professional and consists of all the essential elements relevant to a person's care. It includes details regarding demographics, problems, medications, vital signs, past medical history, immunizations, laboratory data, medical images, and radiology reports.(Menachemi, 2006) EHR automates the access to information, provides the hospitals with the infrastructure to collaborate efficiently at technical levels. Volumes of patient data have been collected, creating an atmosphere suitable for translating data into intelligence.

6. Stakeholders for Establishing Health Management Information Systems-

- Ministry of Health and Family Welfare, Government of India
- Central Government
- State level systems
- District Level bodies
- Public Health Centres

- Hospitals and clinics
- *Aanganwadi* Centres
    - Medical Practitioners
    - Data Scientists
    - Information Managers and LIS Professionals
    - Policy Makers'

7. Benefits of Management Health Information Systems

The core benefits of Management Health Information Systems are-

- **Data Analytics**
    - The healthcare industry constantly produces data. Health information systems help gather, compile and analyze health data to help manage population health and reduce healthcare costs. Then the healthcare data analysis can improve patient care.
- **Collaborative Care**
    - Patients often need to treatments from different healthcare providers. Health information systems — such as health information exchanges (HIEs) — allow healthcare facilities to access common health records**.**
- **Cost Control**
    - Using digital networks to exchange healthcare data creates efficiencies and cost savings. When regional markets use health information exchanges to share data, healthcare providers see reduced costs. On a smaller scale, hospitals aim for the same efficiencies with electronic health records.
- **Population Health Management**
    - Health information systems can aggregate patient data, analyse it and identify trends in populations. The technology also works in

reverse. Clinical decision support systems can use big data to help diagnose individual patients and treat them

Conclusion

Health Informatics is an emerging discipline, explosive growth can be traced in the last decade and has also been shaping several new areas and fields of study. The scope of the discipline leads up to several dimensions paving the way towards development. Health Informatics has emerged along with disciplines such as bioinformatics and biomedical informatics. In order to increase the global outreach of this field re-thinking of health, informatics has to span policy, research, and practice. The learning process at the policy level needs to be drafted and brought about. Health informatics systems are surrounded by the concerns of data governance, project maintenance and design and implementation of strategies. The scholarly communication landscape has evolved over the years and worldwide publications, collaborations can be traced out based on the findings of the study. It has the potential to meet the upcoming needs and requirements of the research scholars, academicians, medical practitioners, government, non-government bodies, and stakeholders. Bridging the gap between filed experts and common man, it's a step towards making "Health for All" a reality and empowering healthcare transformations to take place in a steady and efficient manner.

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Re-Engineering Library Services in Academic Libraries at Digital Era

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Abstract: Re-engineering is very popular modern management techniques. Application of re-engineering is present day need. Hence, present paper high lights how this techniques is applicable to Academics Library. Authors has emphasized on not only historical background of re- engineering but also background of studied library in brief and implementation of re- engineering in five phase manner i.e. activities to be re- engineered , selection of the re- engineering team , vision for the new improved processes and actions needed to implement the new process. This chapter also describe the re-engineering of services and resources of academic libraries.

Keywords: Re-engineering, Academics Library

1. Introduction

The term Business process re-engineering BPR was first introduced by Michael Hammer in 1990 at a Harvard Business Review article, "Re-engineering work: Don't Automate obliterate". Michael Hammer and James Champy have defined reengineering in the book, Re-engineering the corporation as reengineering is the fundaments rethinking and redesign of business processes to achieve improvements in critical, contemporary measures of performance, such as cost, quality, service and speed. Libraries initially originated as document system. However, with the changes the diverse aspects of the human society, libraries too change changed their role. The modem libraries exist to provide reading services to the humanity. Libraries have always tried to adopt the best principles and practices of other sciences and disciplines. They have observed and adopted many tactics and strategies of management discipline and the commercial world.With the growing emphasis on quality improvements, libraries adopting management techniques to give their best in the form of information products & services. The Management theories & principals which are applicable to an organization can be successfully implemented to library. The 1990‟s have seen tremendous evolution of recent management techniques such as T Q M, Re-engineering, Six Sigma etc. Re-engineering which has been very popular in the business world in 1990‟s, is equally beneficial for libraries to redesign their services in order to provide pin pointed exhaustive information up to end users. Re-engineering involves redesigning key processes, while keeping customer at the center of process redesign.

Meaning & History of the Term Re-engineering

The pressures to lower costs, reduce cycle times, raise quality and, in general, make workplace processes more productive & intensive. As a result, re-engineering which "burst upon the management scene in 1990" has been much in vogue. (Davenport). However the term re-engineering was first introduced by Michael Hammer in 1990 at a Harward Business review article, "Re-engineering Work: Don‟t Automate obliterate". (Gaur, Ramesh C.) .However Hammer & Champy (1933) says "Re-engineering is the Fundamental rethinking & radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service & speed." While as per opinion of Davenport (1933) - "Re-engineering is only the part of what is necessary in the radical change of processes, it refers explicitly to the design of new process. The term process innovation encompasses the envisioning of new work strategies, the actual process design activity & the implementation of the change in all its complex technological, human & organizational dimensions.

Objectives of the Study: The objectives laid down for the present study are as follows:

a) To identify the pre-requisites for the application of re-engineering management .

b) To propose a step by step method for re-engineering library & information services and sources for Academics Libraries.

c) To provide a modern re-engineering plan for Academics Libraries.

Need of Re-engineering for Academic Library:

Following reasons points out the need for

Re-engineering in Academics Library

a) To cope the challenges posed by information explosion.

b) To fulfill multidimensional information needs of library users.

c) To redesign information services of Academics Library.

d) To provide pin-pointed exhaustive information to the end-users of the library.

Re-engineering Plan for Academics Libraries: The Re-engineering plan for Academics

Library has been framed in the following five steps.

STEP – I, Processes/Activities to be Re-engineered: In the first step the Re-engineering team has identified the processes/ activities of the Academics, Library that have to be re-engineered. These are as follows.

a) Physical layout/ Facilities of the academic library.
b) Academic Library Collection.
c) Manual Processes of library housekeeping operations.

STEP - II, Selection of Re-engineering Team: For the successful re-engineering of Academics Library a competent team of experts should be established in order to redesign the library & information services of Academics Library.

STEP - III, Status of Current Processes in Academics Library: In most of the Academics libraries maximum processes & in house library operations such as, acquisition, cataloguing, circulation, serials control & various reports are being done manually. Use of Information Technology for library operations is very less.

STEP – IV, Vision For The New Improved Process: Following vision may be developed for the new improved process –

Vision: "We are committed to provide an easy and ready access to the library resources for updating the knowledge base of students and staff. Our endeavor is to keep the users of the library abreast of the state-of-the art inputs in respect of Arts, Commerce & Science, so that, they can face confidently challenges thrown open by 21st century. We are streamlining our concerted efforts to build our library as an excellent center for disseminating information."

STEP –V: Actions Needed to Implement or Redesign the New Process Physical Layout / Facilities of the library In order to provide better services to users, the physical layout of the library may be made as follows –

a) Separate Stack Room.
b) Computer Laboratory with sufficient no of computers having Broad Band Connectivity.
c) Separate Reading Room for students and teachers with sufficient library furniture.
d) Separate Reference Section.
e) Reprographic section
f) Processing section
g) Independent cabin for Librarian and Asst. Librarian.

Library Collection: In order to cope the challenges of multidimensional information needs of the library users, the library collection should built in digital format. It may include -

a) CDs, DVDs, Microfilms etc.
b) Online-Books, On-Line Journals, Online Databases.
c) E-Reference sources.
d) Membership with e-consortia

Manual Processes of Library House Keeping Operations: In order to improve efficiency of library housekeeping operations library should be automated with standard library software. With the help of Information Technology, the library housekeeping operations will be redesigned in the following manner.

a) Automated Acquisition system.
b) Automated Cataloguing system.
c) Automated Circulation system.
d) Automated Serials control system.
e) Automated Reporting system.
f) Automated Stock Verification system.

Library & Information Services: In order to redesign these information services, of

Information Technology may be used in the following way:

a) CAS & SDI services by e-mail.
b) Online Information Retrieval system.
c) Online Resource sharing.
d) Institutional Repository.

Human Resources: The vision for re-engineered HR in the Academics Library is that, all human resources services should be available instantaneously, on demand with radical redesign of workflow processes. Following steps may be conducted for re-engineering of human resources –

a) To inform the library staff about the re-engineering process, its need & impact.
b) To inform the library staff about their roles & responsibilities in Re-Engineering process.
c) Organization of motivation/study tours for the library staff.
d) Organization of in-service training programmes for library staff in the computer laboratory of Academics.

Reengineering of Information Resources: Due to increasing costs of publications it is completely impossible for a individual or library to purchase each and every book of his interest. In this situation to effectively meet the individual information needs, the users are searching for e-books & easy availability with latest information attracting more & more users towards the use of e-books. Online Dictionary of Library & Information Science defines e-books as –"A digital version of a traditional print book designed to be read on a personal computer or on e-book reader." There are two major categories of e-books i.e.

i) Off-line (CD-ROM)
ii) On-line

There are number of e-books in multidisciplinary subject available free-of-cost on internet.

B) Journals to e-journals: In order to provide latest information to the researchers & scholars, the concept of e-journals had been raised firstly in 1945.With the development of communication technology, the usage & popularity of e-journal has been increased Today e-journal is becoming the main source of scholarly information & its use has been increased. Easy and free availability on internet, 24x7 access, easy search facility attracting more & more users towards e-journals. There is number of quality e-journals which are available free-of-cost on Internet e.g. DOAJ provide full text access to 4590 scholarly e-journals. Golnessa, G. M. & Talawar, V. G. (2008) conducted a study at Indian Institute of Science entitled "The use of scholarly Electronic Journals at the Indian Institute of Science: A Case Study in India", with the purpose to investigate the use of scholarly electronic journals at the Indian Institute of Science. The results of the study showed a growing interest in electronic journals among the users at IISc. The electronic journals were mostly used for research needs & PDF format was the most preferred format. The fact is that users have free access to electronic journals at all hours from their own computers seems to be the most appealing feature.

Conclusion

The Library began its re-engineering efforts in 1994 and continues today. Many other projects have been completed or are underway. One of the things we have come to realize is that re-engineering is an ongoing process. Date collection and analysis, and monitoring of cycle times continues for current procedures and for 188 new processes. Change is an opportunity, but sometimes also a problematic fact of life. Planned and managed change remains the goal. Considering the importance of re-engineering in academic library and information services, it is necessary to rethink on this serious issue and how it will apply to the library for providing better services to fulfill multidimensional needs of the present patrons.

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MOODLE AND LIBRARY: An Overview

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Abstract: Information Communication Technology (ICT) is working as a support for any sector. Educational institutes are using internet to provide latest technological developments to their users. In this path of education e-learning has become a modern trend for everyone and playing important role in delivering the course content. This paper discusses about e-Learning system which is globally gaining wide popularity and defend the Open Source Software is known as Moodle. This paper briefly describe about Moodle and its benefits. On the other hand how library can incorporate their resources to give the maximum benefit to their users as well as make a between library and users.

Keyword: Virtual Learning Environment, Moodle, Open Source Software, E-learning

1. Introduction

With recent years, rapid popularity of internet created the demand of new concept that is e-Learning and its skills and procedures. An interactive learning process which includes availability of learning content online as well as offers spontaneous response to the student's learning activities is called E-Learning. Therefore there has been an increasing demand for Virtual Learning Environment (VLE) practices and skills to discuss to on-line learning between student and teachers. Presently various providers are available in the market with commercial e-Learning and Open Source Software (OSS) with free VLE systems. Some of them are Ilias, SAKAI, WebCT, Moodle, Blackboard.

Information and Communication Technology (ICT) is working as a game changer for education sector. Though library is playing an important role in learning and teaching process, but one open source software is in trend to meet the growing interest or demand of all is Moodle.

Moodle Learning Management System: An Introduction

Moodle (Modular Object- Oriented Dynamic Learning Environment) designed by Martin Dougiamas, is a web based Learning Content Management System and most prominent LCMS around the world. It is a free OSS which allows the users to download free of cost, usage, change. It is widely used by the universities to improve collaborative instructive atmosphere. It allows to offer and share documents, assignments, quizzes and many more in an easy-to-learn way. In the

starting it was developed with Linux Operating system, but now it is well-matched with several Windows.

E-Learning System: Moodle

E-Learning is a determination of group in which instructors, inventers, managers and users having different expertise, come closer to serve the need of learners, Now-a-days, demand on-line learners is increasing day-by-day. Although Virtual Learning Environment is works as e-Learning and creates an interactive on-line path between teachers and students with various facilities like anytime and anywhere access independent learning, but besides these there are some essential requirements which demands some another option for work.

In this connection Moodle is available to help educationalists to create high quality online courses environment. It is one of the most user friendly and flexible across the world. It assists to provide assignment, lessons, to share documents, quizzes as well as offer a forum for learners which is easy and high quality learning. A list of specialists have developed e-Learning system Moodle to serve the community with tremendous documentation, strong security support administration, information management system.

Moodle as a VLE has an important feature which is the Moodle.org website which provides a central point for information and collaboration among Moodle users, who include system administrators instructional designers and of course, developers. This site is always evolving to suit the needs of the community.

Why Moodle

Many reports shows that Moodle is highly used by the community and them rating well. Various institutions are using it due to its features of wide variety of active courses in many languages. Users by themselves can post their assignments resources e-journals etc. There are some important reasons for choosing Moodle:

- As an Open Source Software anyone can freely download it, use and modify.
- It works in two way as a content management system & virtual learning environment which leads the teachers to provide and share documents, assignments, discussion with 'easy to learn' process.
- It can be download and use it on any computer and can easily upgrade.
- It is designed in view of public constructionist teaching and good informative tools.

- It is independently used by anyone. Currently across the world many registration have done by various countries as it is offered in different languages.
- It supports Unix, Linux and Windows without any modification. It has many features.

Moodle and Library

Library is changing the learning environment with its updated resources as well as plays an important role in teaching and learning process. It is rarely found that library is involved in e-Learning. Now e-Learning stage is used by the students to get their course material in form of class notes, PPT, syllabus etc. It has been seen that in the digital environment there is a large breach between library and e-Learning and it is required to link this breach with Library Management System to support the available resources related to different courses. On the other hand it is also needed to increase the utilization of databases such as EBSCOHOST, Emerald, Springer, Science Direct, ProQuest etc. along with other resources available in the library.

According to Shank and Dewald (2003) there is two different means are available i.e. macro process and micro process to incorporate the library in e-learning environment with the help of Learning Management Systems.

- Macro Means: In this means all the library resources such as library catalogue, library website, databases available in library, Inter Library Loan, etc. get available in all course sites after incorporating with eLearning stage. Therefore as library supports available resources to its users which leads the maximum usage of resources. We can easily make some changes in searching box for easy searching of the articles, e-Books in the database. Through this method we can easily maintained the resources as well as rise the visibility of the library resources.
- Micro Means: This means is mainly concerned with two things; one is course and second is specific library resources of the course. As this means is specified with course which help the users to access the library resources that are visible related to particular course. The resources which contained by this means are text books, old question paper, research guide etc. Here resources are integrated according to the course. Various full text articles are provided by the databases that are useful for the students. Teachers

can put the link of URL of the article for the students in Moodle. Over all it provides the advantage to the instructor to add resources and activities for their students to complete.

Conclusion

The process of teaching and learning are changing with the introduction of Learning Management System. In this process Moodle is playing an important role all over the world as Virtual Learning Environment and used by various school, universities, companies, independent educators etc. Various tools or facilities create a successful e-learning experience for all and give the opportunity to others to implement it in their institutions. In this changing environment, library is getting a chance to remain as an active part of the learning environment and integrate the library resources into the learning management system. Moodle provides a sufficient possibility to the library to connect most of students as well as enhance their reading habits. We all know that young generation is totally attached with technology. So the library has to take the advantage of the technology and connect them to access their relevant material anywhere anytime.

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Analytical Study of Usefulness of Plagiarism in Acadmic Writing

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Abstract: In this article researcher highlighted thet present era is of information and technology. In this era it is impossible to assert own rights on someone else writing. This is known as plagiarism era. This comes under as a crime in literature world. Today in this time of competition literature that is increased. There are many software's available to stop plagiarism. The software is made available by various standard companies. Few literatures is available for new researcher which does not come under public domain but if they steal the literature than there are punished by educational punishment.

Key words: Plagiarism, Anti-Plagiarism, Scientific Misconduct, Software.

Introduction

Present era is era of science and technology. Science and technology is developed in this century a lot. All the information can be accessed easily with the help of technology. Now the whole world has been converted into the global village. Due to this illegal work and information is not easy to hide. There are many software's manufactured to stop plagiarism and they are known as anti plagiarism. The word plagiarism is derived from the Latin word "**plagiary**" which means to kidnap or abduct.

There are many steps being taken to stop plagiarism like: Bern convention (1886), Universe copyright convention (1952), world intellectual property right (1967) and digital millennium copyright act (1998) etc.

Historical background of Plagiarism

The history of literature that is as much older as the literature writing but plagiarism. This word was first used in 1920. This is based on prominent theory. This word was first used in 1601 where Ben Johnson used "**plagiary**" which means kidnapper.

Copyright

Copyright means the right of publication of literature. Copyright act aims to conserve the literature at any cost. (See our section on "fair use" rules)

Copyright Act

Copyright act does not include the following**.**

- Easily available information like that phone collection.
- Work which has been published by govt. of India or govt. of any country.
- The facts which are not the result of proper research.
- The work which are in public domains.

Fair use

According to govt. the work which can easily be lent or borrowed without any writer permission is known as fair use.

The nature of your use (Copyright work):

If you have used little part of original work then it is not properly use. It you change original work by paraphrasing, it is calling proper use.

The quantity you have used.

The more you have "borrowed," the less likely it is to be considered fair use. What is the percentage of won work is "borrowed" material? What percentage of the original did you use? The lower the better.

Public domain

It means the work which has not been perverse by copyright act. It means this work can easily to be used. This will not lead any plagiarism, if you give proper citation.

Low of public domain

How should we know whether it is public domain or not normally it is considered that the work which has published before 75 years is considered public domain? In Indian literature is preserved till 60 years after the death of writer. If more than one writer joins together, then the creator who survives until the end of that masterpiece gets protection for 50 years of death.

General or Common Knowledge

General knowledge includes historical dates, places etc. for example first present of India, Rajendra Prashad was born on December 3, 1884. "Mahatma Gandhi was

Father of Nation", this is common knowledge for Indian but not other country person.

Literary Attack on words and Ideas

Today is the era of competition and in this era theft of literature has been increased popular historian Stephen E. Ambrose has accused for literary theft.

Area of Plagiarism

Following can be considered the literary theft in present scenario.

- Coping words of other work.
- Wrong information about citation.
- Copy of word and thought of person without proper credit.
- Formation of sentence by changing word without reference.

Types of Plagiarism

1. Not informing the sources of citation:

- **The Ghost writer:** If writer changes the others work by changing words by words.
- **The Photocopy:** If the important part of text being copied without correction by the writer.
- **The Potluck paper:** Trying the literary theft by phrasing.
- **The poor disguise:** Changing in words and sentences.
- **The self-Stealer:** If writer borrows his own literature.

2. Literature theft after given the sources:

- **The forgotten footnote:** writer shows the name of authors but does not publish bibliography.
- **The Misinformer:** if the author published the misinformation about the sources so no one can reach to the original sources.
- **The too- perfect paraphrase:** Author gives right information about the right sources but does not keep text in quotation mark.
- **The resourceful citer:** No original work in paper.

- **The perfect crime:** Author tries to make transparent the sources without any right reference.

Tools for checking Plagiarism and their role:

There are many software's available in market to stop plagiarism in preset timing. The software while stops the plagiarism is known as Anti plagiarism. This anti plagiarism software is very important and they measure the literary skills. They also enhance writing skills.

Anti plagiarism software are observed according to following points

- The scope
- Authenticity of standard company
- Methodology of anti- plagiarism software
- Comparison between special feature and software
- Software must be updated continuously updating

Some Examples of anti- plagiarism software are listed in the table:

Ant-Plagiarism Software	Website Link	Status
Article Checker	http://www.articlechecker.com	Free
Plag .Tracker	http://www.plagtracker.com	Free
Copy Leaks	http://copyleaks.com	Free
Duplichecker	http://www.duplicheker.com	Free
PaperRatter	www.paperratter.com	Free
Plagiarisma	http://plagiarisma.net	Free
PlagScan	http://wwwplagscan.com	Paid
Smallseotools	http://smallseotools.com	Free
Turnitin	http://turnitin.com	Paid
iThenticate	www.ithenticate.com/	Paid
Whitstone	http://wwwwhitstone.com	Free
Quetext	https://www.quetext.com/	Free
Maulik (For Hindi Language)	Maulik Software Limited	Paid

Source: eLearning Industry

Prevention form Plagiarism

- Paraphrasing: Feedback of readers on the same topic written by the different writers.

- Cite: Formal decided by the educational institutions.
- Quoting: one should follow the rules of quoting block quote is being criticized by many higher educational al institution.
- Citing your own material: writers must tell about the citation of pre work and present work in this research paper.
- Referencing: All Authors and writers must produce true and original references this leads the authenticity.
- Quotations: It is a medium to describe to researcher that the information is taken various and many sources so that a researcher can find out that particular source.
- The following information has to be given:
  - Topic of work
  - Address of publisher
  - Date of Publication
  - Page number from where the information is borrowed

The Punishment of plagiarism:

- Humiliation- Individual and Institutional
- Resignation on founding guilt of plagiarism.
- Disciplinary action by the regulation of institutions.
- Promotions can be prohibited.
- Increment in payment can be restricted.
- Registration can be cancelled of a research scholar.
- Allowance can be stopped of a scholar.
- Scholar cannot be promoted to a supervisor.

Conclusion

In present scenario and time plagiarism is common in literary world. This is the reason to be strict regulations and measures are being taken by UGC. This regulation leads qualitative results in research.

The roles of plagiarism based on discussed fact in this article are:

- Writers must give true quotation, which are included in their paper.

- Writers should not copy someone else work.
- There should be footnote given by a writer.
- NO financial loss should be these to the original writer if anthers authors take excerpts from him.
- No misuse should be there of information of public domain.
- There should be name of authors' date of publication, reference of source to stop the plagiarism.

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7. http://www.lib.usm.edu/legacy/plag/paraphrasing.php
8. http://navbharattimes.indiatimes.com/metro/delhi/other-news/copy-right-what-does-the-law-say/articleshow/58316948.cms
9. https://jennifer-cheng-k9e0.squarespace.com/plagiarism-101/what-is-plagiarism/
10. http://www.lib.usm.edu/legacy/plag/paraphrasing.php
11. http://plagarism.org/
12. http://www.du.ac.in/du/uploads/research/06122014Turnitin-Whatis-Plagiarism%20.pdf

Social Networking Websites - Its Tools, Applications and Challenges in Todays Era

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Abstract: This article aims to examine the application and use of social networking sites and challenges in current duration in sharing the resources and interacting with information generators. Now a day there are more than thousands of social networking sites available for sharing and getting information like Facebook, Instagram, Twitter, WhatsApp, Academia, LinkedIn etc. This article highlights the applications of SNSs in the field of social communication, education, healthcare, business and other relevant areas. This also underlines the available social networking sites in every field weather for entertainment or academic use and also in healthcare. It is necessary to mention the role of social media in today's era and also the challenges and issues faced while using SNSs. Social networking sites offers its users to be more creative, dynamic and research oriented. It enhances the knowledge oriented skills of its users and make them more aware as compared to others. While using these sites there is a privacy concern specially for women's and girls.

Keywords:

Introduction

Social Networking Sites (SNSs) such as Whatsapp, Facebook (FB), Instagram, Twitter, Snapchat, Youtube, Tiktok videos' as has attracted and attached millions of users, most of the users have integrated with these sites in their daily routine. There are hundreds of social networking sites, with various technical affordances and supports a wide range of human interests.

Most of the Social networking sites support the maintenance of pre-existing social networks while others can connect to the strangers also, based on shared interests, political ideologies or activities.

Looking on to the fact that there are a high number of SNS users in India which of course has adverse effects on the lifestyle of people (Rosen, 2011). The focus should be on the positive side and one should try to dig out ways in which this practice could lead to a development of the users. Social Networking Sites have numerous features which enables audio-video message, text and pictures, hyperlinks etc. it is being used as a platform for creating awareness, social connectivity, knowledge sharing, advertising, publicity and business promotion.

Definition of Social Networking Sites

A social networking site is a recent phenomenon out of the Internet that allows individuals to create a personal profile/account, and connect with friends and strangers alike almost anywhere in the world.

We define social network sites as web-based services that allow individuals to

1. Construct a public or semi-public profile within a bounded system,
2. Articulate a list of other users with whom they share a connection, and
3. View and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site.

Globally, millions have joined one or more social sites such as Face book, My space, LinkedIn and whats app.'

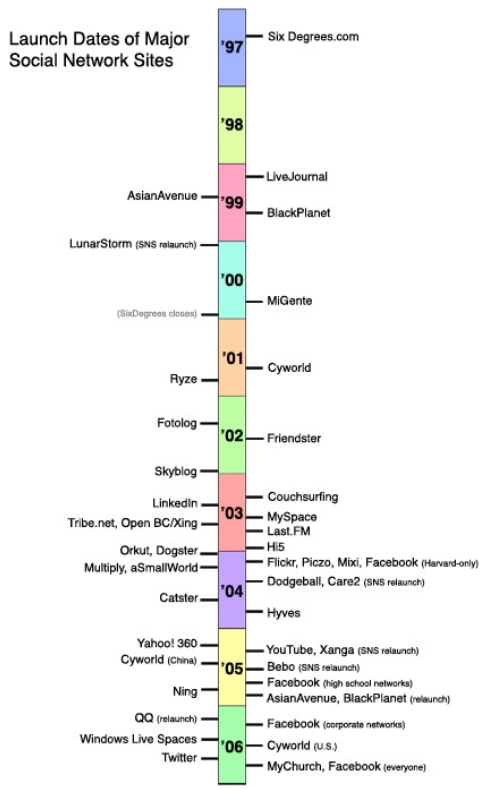


Figure 1. Timeline of the launch dates of many major SNSs and dates when community sites re-launched with SNS features

Some of the Social Networking Sites are as Following:

Blog: A blog (a blend of the term web log) is a personal journal published on the World Wide Web consisting of discrete entries ("posts") typically displayed in reverse chronological order so the most recent post appears first. Blogs are usually the work of a single individual, occasionally of a small group, and often are themed on a single subject.

Facebook: A social networking service.http://www.facebook.com/

Flickr: A Photo sharing service.http://flickr.com/

RSS, Syndication and Aggregation: In computing, a feed aggregator, also known as a feed reader, news reader, RSS reader or simply aggregator, is client software or a Web application which aggregates syndicated web content such as news headlines, blogs, podcasts, and vlogs in a single location for easy viewing.

Skype and Skype cast- The service allows users to communicate with peers by voice, video, and instant messaging over the Internet. Phone calls may be placed to recipients on the traditional telephone networks.

Twitter: Twitter is an online social networking service and micro blogging service that enables its users to send and read text-based posts of up to 140 characters, known as "tweets". It was created in March 2006 by Jack Dorsey and launched that July.

Other Social Networking are

- You tube
- Whatsapp
- Linkedinn
- Instagram
- Linkedin
- LIS Link
- Library soup
- Academia
- Orkut
- Ning
- Myspace

- Wikipedia
- Mojo
- Tiktok
- Tiki vedio
- Roposo
- Smack vedio

Social Media Tools

Basically there are three types of social media tools they are as following: -

1. ***Listening platforms***: This platform helps to gather information about our ideas are liked or not. It helps in the enhancement of latest information and trends which are going on. It helps in the relevancy of content.
2. ***Publishing platforms***: - Publication of information helps to spread the thoughts worldwide. Posting information on social media allows sharing content easily and getting viral soon.
3. ***Competitive analysis platforms***: - These social media tools help to compare different brands and industries. e.g. most of users like google.com to search instead of any other search engine as it is easy to use and user friendly.

There are various free tools are also available which helps to spread information and enhance the value of our information/business, like: -

- Google alerts,
- Tweet desk,

And other native tools offered by Facebook, Twitter and more.

Applications of Social Networking Sites

There are enormous applications of social networking sites as they provide internet based platform for sharing of ideas and connect socially. Some of the common applications of SNSs are computer mediated social communication, Education, Business, Healthcare, politics, religion, crowdsourcing etc.: -

Social Interaction: SNSs facilitates computer based computer interaction, SNSs connects peoples who share same interests and activities in the field of politics, economic and geographic. They are the current or we can say that modern form of entertainment. People use them to meet new friends, find old friends, locate people with similar interests, and staying in touch with old acquaintances. They also provide an online environment for people to communicate and exchange personal information for dating purposes. Some job seekers use social networks in their job search increasing their chances of receiving job offers and finding gainful employment.

Education: Social networks are impacting the way students and educators engage in learning. They are now used for learning, educator professional development, and content sharing. Scientific communities use social media to exchange knowledge. Researchers and librarians use social networks frequently to maintain professional relationships and share ideas. Social media can become research and learning networks. Social networking media such as Facebook, Twitter, and Instagram are widely used at many universities with each university having at least a page on a site.

Healthcare: Social media enables different types of social connectivity among different stakeholders such as doctors, patients, and caregivers. Social networking is an effective tool for teaching and learning for doctors and nurses as SNS is used to provide new information from research and assist in providing quality care to their patients. Virtually all aspects of healthcare can be inherently affected by these technologies. Examples of health-related social networking sites include healthchapter, Inspire, DailyStrength, ToolsToLife, Health Care 2.0, LiveStrong, Everydayhealth, revolutionhealth, MyCancerPlace, Planet Cancer, No Surrender, Prostate Cancer Infolink, Psych Central, sobercircle, diabetic connect, and DailyPlate

Challenges And Issues

- As social media attempt to fulfill cognitive, affective, personal, and social needs, it is in turn affecting everyday life, including relationships, family, marriage, school, church, and entertainment.
- Although a minimum age is required for joining SNSs, many children/ students misrepresent their real ages and join. These students learn about safety and privacy issues in a haphazard way and suffer from training

deficiency

- In the past, some regarded social networking as a distraction and offered no educational benefit for students in junior or high school. So blocking these social networks was considered a form of protection for students against wasting time, addiction, cyberbullying, and privacy theft.
- Others feel that the schools that block social networking services are preventing students from learning the skills the youths need in navigating the digital world with confidence and therefore regard blocking social networking sites as counterproductive.
- Privacy on social networking sites is an important issue. For example, third parties often use information (such as personal information and profile) posted on social networks for a variety of purposes. Privacy concerns differ between users according to their gender and personality. Some studies have indicated that women often have more privacy concerns than men.

Conclusion

Social networking has changed the way people communicate, share information, and interact socially. It allows individuals to connect and socialize with others, regardless of location. As the popularity of social networking increases, new applications for the technology are often being observed. A new trend is the social internetworking of machines. The ultimate goal in this evolution is creating the Internet of Things (IoT) and social networks among machines.

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Artificial Intelligence in Libraries

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Abstract: In this paper, the authors have tried to enlist those areas in which artificial intelligence could be incorporated in libraries. Some of the areas where AI can be incorporated are, Strategic Planning, Smart Libraries, Academic Libraries, Law Libraries, and Music Libraries.

Keywords: Artificial Intelligence, Library, Music, Smart Library, Strategic Planning

1. Introduction

Artificial intelligence helps bridge the gap between human and machine intelligence. Artificial intelligence is composed of reasoning, learning, problem solving, perception, and linguistic intelligence (Selvamanikkam, 2018). f

2. Definition

2.1. Artificial Intelligence

‘‘The use of programs to enable machines to perform tasks which humans perform using their intelligence. Earlier AI avoided human psychological models, but this orientation has been altered by the development of connectionism, which is based on theories of how the brain works’. (Grewal, 2014).

‘Artificial Intelligence (AI) is the field of computer science dedicated to solving cognitive problems commonly associated with human intelligence, such as learning, problem solving, and pattern recognition.’ (Amazon Web Services, Inc., 2021).

2.2. Library

‘A library is a collection of resources in a variety of formats that is (1) organized by information professionals or other experts who (2) provide convenient physical,

digital, bibliographic, or intellectual access and (3) offer targeted services and programs (4) with the mission of educating, informing, or entertaining a variety of audiences (5) and the goal of stimulating individual learning and advancing society as a whole' (American Library Association, 2019).

3. Review of Literature

Asemi and Asemi (2018) applied Exploratory Factor Analysis (EFA) as a primer method for identification of the most applicable AI techniques categories in LIS. The results showed that most developed Recommender Systems (RM) in library systems in Iran and Natural Language Processing (NLP) facility is the most undeveloped criterion.

Through the article by Vijayakumar and .Sheshadri (2019) it could be understood that Artificial Intelligence could be applied in the field of Reference Service, Cataloguing, Classification, Indexing of periodicals, and acquisition. Natural Language Processing, Machine learning, Robotics, Intelligent Interfaces to Online Databases are some of the areas in which Libraries can consider utilising the power of AI.

The study by Wheatley and Hervieux (2019), analysed the effect of AI in Academic libraries. The results of the study indicates that While Stanford and MIT have engaged with AI, the University of Oklahoma and the University of Rhode Island have emerged as the leaders in involvement with AI. The study also notes that in 2006 the MIT Library partnered with the MIT Computer Science and Artificial Intelligence Lab on a grant-funded project to create search engines that use AI.

The study by Massis (2018) observed that not only can AI influence the partnerships the library can enjoy with its colleagues in academe within the areas of research and scholarship, but also librarians have an opportunity to discover the many areas of services it provides to offer further enhancements, and therefore, remain as a progressive hub of technology.

4. Artificial Intelligence in Libraries

INDIAai (https://indiaai.gov.in/) is the National AI Portal of India - a central hub for everything AI in India and beyond. A joint initiative of Ministry of Electronics and Information Technology, Government of India (MeitY), National E-Governance Division (https://negd.gov.in/) and NASSCOM (https://nasscom.in/), the website aims to be the trusted content powerhouse in the backdrop of India's journey

to global prominence in Artificial Intelligence. Let's look into some areas of Applications of AI in Libraries.

4.1. Artificial Intelligence in Strategic Planning

Most university libraries do include statements about digital innovation and initiatives, and some, such as the University of California Berkeley, specifically address areas such as digital scholarship. It is also interesting to note that some universities and their libraries do not have strategic plans or mission statements publicly-accessible on their websites. (Wheatley & Hervieux, Artificial intelligence in academic libraries: An environmental scan, 2019).

4.2. Artificial Intelligence in Smart Libraries

Artificial intelligence covers almost all of the business activities of the Smart Library. Through the case analysis and systematic review of a large number of domestic and foreign literature and practical applications, the three application areas are summarized: Intelligent resource system, intelligent management (smart warehouse management and intelligent security management), intelligent services (smart application services, intelligent consulting services, intelligent knowledge services). (Yu, Gong, Sun, & Jiang).

4.3. Artificial Intelligence in Academic Libraries

Academic librarians are highly receptive toward the potential of integrating artificial intelligence into the operations of the library and demonstrated that they are generally early adopters of new information and communications technologies. Improving library search, expediting cataloging, and assisting with reference services were all areas that rated highly (Lund, Omame, Tijani, & Agbaji, 2020).

4.4. Artificial Intelligence in Law Libraries

Casetext is an AI powered legal research platform, is a cost-effective alternative to Lexis and Westlaw. It uses an AI research assistant named CARA A.I. to find on-point legal resources based on the facts, legal issues, and jurisdictional information the machine extracts from a document (Craigle, 2019).

4.5. Artificial Intelligence in Music Libraries

Automated Playlist Generation, Music infomatics, Music composition, etc are the areas where AI has a major role to play. "Information Philharmonic" system has a powerful artificial intelligence system learning ability and can generate

various calculation methods. It can interactively change according to the change of the player's music rhythm and continuously adjust and improve his own accompaniment ability (Ye, 2020).

4.6. Applications of Expert Systems in Reference Service

Following are some of the examples of Expert Systems used for Reference Service. REFSEARCH, POINTER, Online Reference Assistance, AMSWERMAN, and PLEXUS (Mogali, 2014).

5. Conclusion

In this paper the scope of artificial intelligence in library and information science field is presented.

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Use of UGC-Infonet e-Journals by Research Scholars of Kakatiya University - A Case Study

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Abstract: The University libraries are plays an important role in research process like providing use full information to the right person on right time. This study is an attempt to explore the usage of UGC-Infonet e-journals by research scholars of Kakatiya University. In this study investigator distribute 125 questionnaires from different departments of Kakatiya University, 103(82.4%) filled questionnaires were received. Majority of the research scholars 39(37.8%) knowing of use of UGC-Infonet e-journals with the help of library staff. Shows majority of the research scholars 32(31%) use UGC-Infonet for research purpose, followed by 21(20.5%) research scholars choose their option as above all. UGC-Infonet e-journals are very needy for academics.

Keyword: e-resources, e-journals, UGC-Infonet Digital Library Consortium, Kakatiya University Library.

1. Introduction

The fundamental reason for University library is to serve the required information to the researchers in their research. The library is viewed as the core of any scholastic. The major point of any University library to educating, Learning and research exercises, the university libraries in this way give pertinent resources to its users. It is a necessary piece of the encouraging learning process at the research level. The present investigation is about usage of electronic journals by research scholars of kakatiya university library.

2. About UGC-Infonet Digital Library Consortium (e-ShodhSindhu)

The UGC-Infonet Digital Library Consortium was formally launched on 28thDecember 2003 by Honorable President late Dr. A.P.J.AbdulKalam. The Consortium gives access to in more than 7500 electronic journals and 10 bibliographic databases from 26 publishers in various disciplines. This consortium is organized by INFLIBNET center with the supported of UGC.

Recently MHRD is combine three consortia's are UGC-INFONET Digital Library Consortium, NLIST and INDEST – AICTE Consortium named as e-ShodhSindhu to give better electronic resource services to user community. It will keep on providing current and archival access to more than 15,000 electronic journals and

various bibliographic, reference and databases in various disciplines from a vast number of publishers and aggregators to its part foundations including midway subsidized specialized organizations, universities and institutions that are secured under 12(B) and 2(f) Segments of the UGC Act.

3. Kakatiya University Library- A Profile

Kakatiya University was set up on 19th August, 1976 to satisfy the desires of the Telangana individuals for advanced education. The University established in an expansive area of around 650 acres of land, the establishing of the University was in certainty a notable occasion in higher education of this region. University Library Building was developed by Prof. K.Venkat Ramaiah, the principal Vice-Chancellor of Kakatiya University broadly thought about the designer of the University. It is one of the huge libraries here taking into account the requirements of the students and researchers of the University Campus as well as of all affiliated colleges under Kakatiya University. Keeping in mind the end goal to accomplish practical productivity, the library is sorted out into various sections.

University library providing Open Access System to the users. University library using SOUL software which is outlined and created by INFLIBNET, Ahmadabad. Researchers have free access to about 15 thousand research journals provided by INFLIBNET under E-ShodhSindhu project. Round the clock reading facility is being provided to the students throughout the year. All the constituent colleges and departments were brought under Campus Network providing round the clock INTERNET facility. OPAC is additionally accessible for Library resources. Competitive Examinations Material Cell provide latest magazines and books are procured for students who are preparing for national and state level entrance tests, for example, UPSC, TSPSC, NET, Banking, Railways, LIC. The circulation section serves around 200 to 250 users on a normal every day.

4. Objectives:

1. To find how frequently users are visit to library.
2. To find how respondents know about UGC – Infonet Digital Library Consortium
3. To find how respondents knowing the use of UGC – Infonet Digital Library Consortium.
4. To find the what purpose research scholars using UGC-Infonet e-journals
5. To find what type of key words are using to search UGC- Infonet e-journals.

6. To find how respondents are preserving their output.
7. To find out the problems in using of UGC- Infonet e-journals.
8. To find the rate of satisfaction of research scholars about using UGC- Infonet e-journals.
9. To find out any training programmes are required or not for research scholars.

5. Methodology

In this study investigator used we structured questionnaire for data collection purpose. Questionnaire is completely based on objectives of the study. The questionnaires were distributed among 125 members who are the research scholars of Kakatiya University, Warangal in this 105 research scholars are responded. Present study conducted in the period 2017-2018. The questionnaires were personally distributed among research scholars and collected data. Feed back of the respondents is tabulated and analyzed. Survey method is adopted for this study.

6. Scope of the Study

- The scope of the present study is restricted to research scholars of Kakatiya University, Warangal.
- UGC-Infonet Digital Library Consortium (e-ShodhSindhu).

7. Review of Literature:

There are large numbers of studies made on usage of UGC-Infonet e-resources.

Chanchinmawia, F.andVerma, Manoj Kumar (2017) in this study respondents are U.G and P.G of Academy of Integrated Christian Studies, Aizwal. Here investigator assess information literacy skills among respondents. More than half of the students are regularly visiting the library and barrowing books. Majority of the respondents has good computer skills they very well know about sending e-mail, print, download. This academy is every year conducting orientation programme for students, it is very good sign to improve library usage skills among students. **Chanchinmawia, F. and Verma, Manoj Kumar (2016)** examined the faculty members and research scholars of Mizoram University. Inverstigator

choose research scholars of three departments are maths, physics, chemistry. Faculty members and research scholars are aware of UGC-infonet Digital Library Consortium. The main source to know this consortium is friends and colleagues. Respondents using UGC-Infonet e-journals regularly and using it for teaching research purpose. Most of the respondents feels that UGC-Infonet is very useful for faculty members and research scholars. **Kishore Kumar, M and Anjaiah, M (2018)** study explains majority of respondents are access UGC-Infonet e-journals from university library. Respondents given first priority to journal name as keyword in searching for information. Most of the faculty members using the e-resources for teaching purpose, research scholars for research purpose.

Kishore Kumar, M and Anjaiah, M (2017) made a study on usage pattern of UGC-Infonet e-journals by faculty members and research scholars of Osmania University. Majority of the respondents using e-resources for the purpose of teaching and research. Professional colleagues play an important role in knowing about UGC-Infonet e-journals. Majority of respondents opined that they need training to use e-journals. Half of the respondents are satisfied with this consortium. **Lokesha, M and Bhandi, M.K (2017)** examined the Utilization of UGC-Infonet learning research center services of Mangalore University. Investigator selected respondents from three disciplines are Science and Technology, Social Science and Commerce & Management. All the respondents aware of UGC-Infonet and using it service. Most of the respondents opined accessing digital resources is easy and saving their time. Majority of respondents preferred to down load information in PDF format. **Verma, Manoj Kumar and Parang, Buit (2015**) basic reason of the study is to evaluate the ICT skills and use of e-resources by the physical scientist of Assam University and Mizoram University. In this study investigator choose sample as teachers and research scholars, reveals teachers are using e-resources. Very less percentage f the research scholars are not using e-resources service. Respondents had good computer knowledge and skills. All the respondents are utilizing internet facility. Most of respondents are using e-ShodhSindhu consortium and mentioned user satisfaction rate as good.

8. Data Analysis and Interpretation:

The data collected from research scholars of Kakatiya University, Warangal by using questionnaires based survey method. On the basis of the responses the data is analyzed and interpreted in following tables.

Table-1 Distribution of Questionnaires

S. No	Status of the Respondent	No. of Questionnaires distributed	No. of Questionnaires received
1	Research Scholars	125	103
	Total	125(100)	103(82.4%)

Table- 1 shows that, a total of 125 questionnaires were distributed among research scholars, but the respondents were 103(82.4%).

Table-2 Department wise – Distribution

S. No	Department	Research Scholars	
		Received	Distributed
1	Mathematics	20(80%)	25(100%)
2	Physics	19(76%)	25(100%)
3	Chemistry	21(84%)	25(100%)
4	English	23(92%)	25(100%)
5	Education	20(80%)	25(100%)
	Total	103	

Talble-2 explains number of questionnaires distributed and received in department wise. 25 Questionnaires distributed to each department research scholars, selected departments are mathematics, physics, chemistry, English and Education and received as fallows 20(80%), 19(76%), 2121(84%), 23(92%), 20(80%).

Table 3 - How often visit library

S. No.	Frequency	Research Scholars
1	Every Day	18(17.4%)
2	Once in Two Days	25(24.5%)
3	Once in Three Days	36(34.9%)
4	Once in a Week	11(10.6%)
5	Once in Every Fifteen Days	13(12.6%)
	Total	103(100%)

Table-3 explains that most of the research scholars 36(34.9%) are come to library once in three days. 25(24.5%) are visiting library once in two days and 18(17.4%) are visit library every day.

Table-4 How you know about UGC- Infonet Consortium

S. No	Source	Research Scholars
1	Library	27(26.2%)
2	University Website	22(21.5%)
3	INFLIBNET Website	10(09.7%)
4	Professional Colleagues	39(37.8%)
5	Any others	5(04.8%)
	Total	103(100%)

Table-4 indicates that almost all research scholars are aware of UGC-Infonet Consortium. Majority of research scholars 39(37.8%) know about this consortium through professional colleagues. 27(26.2%) research scholars are aware through library.

Table 5 Knowing of use of UGC-INFONET

S. No	Way of knowing	Research Scholars
1	Known from library staff	39(37.8%)
2	Known from friends	32(31.0%)
3	On your own	20(19.6%)
4	Through attending training programmes	9(8.7%)
5	Any others	3(02.9%)
	Total	103(100%)

From above table – 5 majority of the research scholars 39(37.8%) knowing of use of UGC-Infonet e-journals with the help of library staff. 32(31.0%) research scholars depending on friends and 20(19.6%) research scholars are knows by their own in using of UGC-Infonet e-journals.

Table-6 Purpose of Using UGC-Infonet e-journals

S. No.	Purpose	Research Scholars
1	For subject knowledge	15(14.5%)
2	For research	32(31%)
3	For teaching	18(17.6%)
4	For Professional development	9(8.7%)
5	For writing articles	8(7.7%)
6	For above all	21(20.5%)
	Total	103(100%)

Table-6 Shows majority of the research scholars 32(31%) use UGC-Infonet for research purpose, followed by 21(20.5%) research scholars choose their option as above all. 15(14.5%) respondents using UGC-Infonet e-journals for improve subject knowledge. From this table UGC-Infonet e-journals are very needy for academics.

Table-7 which key word you use to Search e-journals in UGC-Infonet

S. No.	Key Word	Research Scholars
1	By Journal Name	28(27.1%)
2	By Publisher	10(9.8%)
3	By Author	23(22.4%)
4	By Subject	35(33.9%)
5	By ISSN Number	7(6.8%)
	Total	103(100%)

Table-7 Indicates that the majority of the research scholars 35(33.9%)use the subjects name as key word to search e-journals in UGC-Infonet, 28(27.1%) are use the journal name as the key word to search e-journals in UGC-Infonet. 23(22.4%) are using author name as keyword.

Table-8 How do you preserve the out put

S. No.	Method of Preserve	Research Scholars
1	On paper	20(19.4%)
2	Pen Drive /CD/DVD	45(43.6%)
3	e-mail attachment	27(26.4%)
4	Above all	11(10.6%)
	Total	103(100%)

The above Table-8 stated that the majority of the research scholars 45(43.6%) are preserving their out-put in pen drive/CD/DVD, followed by 27(26.4%) are using e-mail attachment facility. 11(10.6%) are mentioned all the three methods they adopt to preserve their out-put.

Table-9 Problems in Accessing the UGC-Infonet e-journals

S. No.	Problems	Research Scholars
1	Slow Bandwidth	22(21.3%)
2	Software Problems	10(9.7%)

3	Insufficient Terminals	31(30%)
4	Inconvenient Timings	5(4.8%)
5	Downloading Problem	7(6.7%)
6	Internet Connectivity Failure	28(27.1%)
	Total	103(100%)

The above Table-9 stated that most of research scholars 31(30%) are facing insufficient terminals problem while accessing the e-journals. Followed by 28(27.1%) are facing the problem of internet connectivity. 22(21.3%) are about slow bandwidth.

Table-10 Need of Training Programmes

S. No.	Status of Respondent	Yes	No	Total
1	Research Scholars	37(35.9%)	66(64.1%)	103(100%)

Above Table-10 states that majority research scholars 37(35.9%) need the Training programmes, followed by 66 (64.1%) research scholars do not need any training programmes.

Table-11 Rate of satisfaction while accessing the UGC-Infonet e-journals

S. No.	Status of the Respondent	Excellent	good	Average	Poor	Total
1	Research Scholars	24(23.3%)	51(49.5%)	20(19.4%)	8(7.8%)	103(100%)

Table-11 states the details about user opinion on UGC-Infonet e- journals. Out of 125 research scholars 51(49.5%) rate of satisfaction is good, followed by 24(23.3%) research scholars mentioned as excellent. 28(27.1%) research scholars are mentioned it as average and poor.

9. Findings of the Study:

The Following findings were found in my present study are

1. Majority of the research scholars 36(34.9%) are come to library once in three days. 25(24.5%) are visiting library once in two days. only 18(17.4%) research scholars are visit library every day

2. Majority of research scholars 39(37.8%) know about this consortium through professional colleagues. 27(26.2%) research scholars are aware through library. 22(21.5%) research scholars are aware through university website.
3. Majority of the research scholars 39(37.8%) knowing of use of UGC-Infonet e-journals with the help of library staff. 32(31%) research scholars depending on friends and 20(19.6%) research scholars are knows by their own in using of UGC-Infonet e-journals
4. Majority of the research scholars 32(31%) use UGC-Infonet for research purpose, followed by 21(20.5%) research scholars choose their option as above all. 15(14.5%) respondents using UGC-Infonet e-journals for improve subject knowledge
5. Majority of the research scholars 35(33.9%)use the subjects name as key word to search e-journals in UGC-Infonet, 28(27.1%) are use the journal name as the key word to search e-journals in UGC-Infonet. 23(22.4%) are using author name as keyword
6. Majority of the research scholars 45(43.6%) are preserving their out-put in pen drive/CD/DVD, followed by 27(26.4%) are using e-mail attachment facility. 11(10.6%) are mentioned all the three methods they adopt to preserve their out-put
7. Most of research scholars 31(30%) are facing insufficient terminals problem while accessing the e-journals. Followed by 28(27.1%) are facing the problem of internet connectivity. 22(21.3%) are about slow bandwidth
8. Majority research scholars 37(35.9%) need the Training programmes
9. Majority of the research scholars 51(49.5%) rate of satisfaction is good, followed by 24(23.3%) research scholars mentioned as excellent.

10. Conclusion & Suggestions:

Technological literacy is very essential to academic community in this digital era. Having so much of electronic resources in the library is useless, without having proper retrieval knowledge. This present survey based study explores that UGC-

infonet e-journals is most useful for research purpose. Research scholars are very interested about research and they are utilizing library services very well. Most of the research scholars, rate of satisfaction about UGC-Infonet e-journals is very good. Respondents are facing some problems like insufficient terminals, speed of internet, slow bandwidth. Library staff must be update in using latest technical equipments; it should be useful for themselves and also in providing efficient services to the user community.

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Contribution of Libraries in the Development of Society

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Abstract: The library is a social organization and its main function is to meet the reading needs of the users. Today's age is an age of information as well as competition and human beings need information in every field, which means that the progress of human beings today depends mainly on the information. Today human needs have been diversified. There have been radical changes in library services. ICT is widely used in libraries. Therefore, it is possible to provide services to the readers as soon as possible. There has also been a surge in library work. Libraries are struggling to satisfy their cravings for knowledge. A green library is being set up to create a conducive environment for the users while providing library services. Efforts are also being made to set up a green library in the existing building. Educational libraries, public libraries, special libraries as well as national libraries are working hard to provide the necessary information to their users and alternatively to achieve the objective of making progress in society. For this, the library provides the services like books exchanging, information, reference, technical i.e. classification and cataloguing, reprography, bibliographical, CAS and SDI, etc. They also provide their services to save the precious time of the readers by providing CDs, e-books, e-journals, databases and also to make the users use their time wisely. The present study focused on how libraries contribute to the development of society.

Keywords: Library, Education, User Education, Recreation, Society, ICT.

1. Introduction

The library is a social organization as well as a service-oriented organization and its main function is to cater to the information needs of the users. The individual, as well as the society, needs information in every field. Without information, the individual, the society, and the country can't make progress. The library plays an important role in imparting knowledge to society by collecting, organizing, processing, and disseminating information. Society refers to people living together

in a community, sharing common interests, and maybe having distinctive customs and institutions. The term society may also be used to refer to various distinctive cultural groups of people. Put simply we may view society as an aggregate of individuals living together as interdependent members in a highly structured system of communities (Murugan, Krishna, 2018).

Libraries through their various services like, book exchange services, information services, reference services, referral services, technical i.e. classification and cataloguing services, reprography services, bibliographic services, CAS and SDI services etc. meet the need for knowledge of the society. Information is playing an important role in the progress of the society as well as the country and libraries are constantly striving to make the most of it. Nowadays, the term 'information explosion' is being used to refer to the expansion of information. This will give you an idea of the scope of information generation. But even so, we can say that it is insufficient. Libraries are also insufficient with information. However, as libraries store more and more information to meet the needs of the users or society, libraries play a vital role in the development of society.

2. Objectives

1. To explain how library services affect society.
2. To state how the library services have been affected in modern Times.
3. To explain how ICT is being used in the library services and how the utilization of user's time is being used.
4. To explain how the role of the library is crucial in the overall development of society.

3. Methodology

in the present study descriptive method is applied, for that articles published in various journals on this theme are referred and conclusions are drawn.

4. Impact of Library Services on the Society

Human progress is gradual. Due to the development of the library, it has been greatly enhanced. In the past, library services were not used as much as the society was illiterate, but gradually the literacy rate increased and as the educational progress increased, the use of libraries increased due to the establishment of educational institutions. As a result, society progressed. In the past, library work was done

manually, so it took a lot of time and effort to provide the service. It used to cost a lot. But since ICT is being used extensively today, once the entries were done, it was also used in many alternative activities such as cataloguing, exchanging books, etc. This makes it possible to provide library services in less time as the information needs of the users are being met on time.

5. Impact on Library Services in Modern Time

As the library is a service-oriented organization, many activities are carried out within the library such as book processing, book exchanging, cataloguing, classification, bibliography, reference service CAS and SDI service etc. This work consisted of a large amount of time and labour. However, with the advent of information and communication technology, it has become possible to provide these services faster, saving time and effort, and putting that time and effort into other tasks. The implementation of new information and communication technology in library work has widened the provision of library Services (Nuut, 2004).

6. Contribution of Library Services in the Development of Society

The contribution of libraries in the development of society can be grouped under five major categories below:

1. Education
2. User education
3. Recreation
4. Library as a place
5. Social and cultural

7. Education

Library and education are twin sisters. The two cannot be separated from each other. Library and teaching work are complementary and education cannot exist without a library. Libraries play a major role in education, research and training in the society by accessing knowledge resources. For this, they collect, organize and disseminate information etc. to provide reading services to the users/beneficiaries i.e., students and teachers.

In the same way, they provide information services and provide informal self-learning facilities. According to Oyeronke (2012), 'Generally, a library is a place

where individuals access information and ideas. Access to information is very crucial; It accelerates the level of individual advancement as well as corporate educational development. Access to information focuses on the rights of educational to have access to the information at the right time.

8. User Education

Libraries conduct user education so that the library can be used in the right way. In this, new library users are introduced to the library's stack rooms, various sections of the library, library working methods, information or computer literacy etc. The purpose of this is to make maximum use of the collection and services in the library.

9. Recreation

In addition to academic work, libraries also organize entertainment programs. The library organises book exhibitions and provides biographical books, stories books, comics, CDs and internet facilities etc. Similarly, they organize various competitions, lectures, etc. on the occasion of story hours, anniversaries of great men. Recreational services geared towards bringing particularly young children together thus inculcating in them the spirit of one through the provision of information that brings the attention of the children to unity and cohesion can be disseminated in the children's section of the public library to foster National integration for development (Echem, Lulu- Pokubo, Ejuh, 2018).

10. Library as a Place

The library serves as a hub for users to make the most of their free time. In this regard, libraries provide their services to users by providing newspapers, books, periodicals, internet. Libraries provide services to the disadvantaged community. Libraries have a role in Britain and across the world in bridging the divide between the advantaged and the disadvantaged in our local and our global communities (Mckee).

In the complicated modern society, libraries have many kinds of answers to many demands of the society as well as those of the citizens. They have potential means to serve both the information society development and their traditional humanistic tasks. May be information technology will even make it easier to combine these elements in the future than the past (Ryynanen, 1999).

11. Social and cultural

The library is a social institution. Public libraries provide their services to all people of the society without any discrimination such as child-old, man-woman, poor-rich, black-white etc. Public libraries democratize information and knowledge by serving all sections of society on the principle of equality. It also seeks to inculcate a culture of reading by providing equal opportunities. The educational library also caters to the information needs of the users by providing its various services. While libraries play a role in the social sphere, they contribute to the cultural sphere by organizing lectures, various competitions, story hours, book exhibitions, etc. on the occasion of anniversaries and anniversaries of great personalities. They also fulfil their role in the society by providing informational services on agriculture, trade, industry, employment etc. They also preserve traditional knowledge. Similarly, the function of the library is not only to provide informational reading services but also to create a conducive and healthy environment in the reading room for the users. In this regard, a green library / sustainable library is being set up and the libraries are becoming eco-friendly.

12. Barriers in Library Services

1. Untrained staff
2. Inadequate equipment
3. Insufficient funds
4. Information computer illiteracy
5. Lack of school library

13. Conclusion

The important task of the library is to make the right book available to the right reader at the right time and the libraries are working from that point of view. Users always feel the need for information and many books cannot be purchased by readers. Libraries are also not full of information but libraries are the ones that provide more and more reading material. Therefore, the users can meet their informational needs and facilitate the users for their welfare that is why the participation of the library in the development of the society is very important.

14. Suggestions

1. To provide training to the library staff

2. To provide computer equipment to the library to provide services as soon as possible
3. To provide funds to public libraries
4. To set up school libraries
5. To provide adequate funds to libraries as all libraries are always financially strapped, etc.

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A Digital Library: History and Feature

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Abstract: A Digital Library is a special library with a focused collection of digital objects that it include text, visual material, audio material, video material, stored as electronic media formats, along with means for organizing; storing, Digital libraries give access to multiple contents with a potentially infinite number of resources and selections at hand. The main limit for traditional libraries is represented by physical space: books consume a lot of it and people often have to walk round in search of a particular material. The World Digital Library opened with 1,236 items. In 2018, it lists more than 18,000 items from nearly 200 countries, dating back to 8,000 BCE. After almost 20 years without participation; the United States re-established its permanent delegation to the United Nations Educational, Scientific and Cultural Organization in 2003. Dr. James H. Billington, Librarian of Congress, was nominated as a commissioner of the U.S. National Commission to UNESCO and was invited to give a plenary speech at its inaugural conference in June 2005. His speech, entitled A View of the Digital World Library, described a vision in which the rich collections that "institutions, libraries, and museums have preserved could be given back to the world free of charge and in a new form far more universally accessible than any forms that have preceded it."

In India on 19th June 2018 marked a milestone in the history of education in India with the formal launch of the National Digital Library Educational materials are available for users ranging from primary to post-graduate levels. NDL has been designed to benefit all kinds of users like students, teachers, researchers, librarians, library users, professionals, differently abled users and all other lifelong learners. NDL is the Single Window Platform that collects and collates metadata from premier learning institutions in India and abroad, as well as other relevant sources. It is a digital repository containing textbooks, articles, videos, audio books, lectures, simulations, fiction and all other kinds of learning media.

Keywords: Content Analysis, Website Evaluation, Deemed Agricultural Universities, India, Web Contents

1. Introduction

As ancient civilizations developed techniques for producing paper, grand libraries were built to house the great collections of scrolls that governments and individuals began to develop. These great ancient libraries included the Library of Alexandria and the Chinese Imperial Libraries created during the Han Dynasty Zenodotus. The first recorded Librarian was Zenodotus of Ephesus, holding that post from the end of Ptolemy I's reign. He was a Greek grammarian, literary critic,

and Homeric scholar. A native of Ephesus and a pupil of Philitas of Cos, he was the first librarian of the Library of Alexandria. The earliest records of a library institution as it is presently understood can be dated back to around 5,000 years ago in the Southwest Asian regions of the world. One of the oldest libraries found is that of the ancient library at Ebla (circa 2500 BCE) in present-day Syria.

"The library is now a part of a complex and dynamic educational, recreational, and informational infrastructure." The digital library concept can be traced back to the famous papers of foreseer scientists like Vannevar Bush and J.C.R. Licklider identifying and pursuing the goal of innovative technologies and approaches toward knowledge sharing as fundamental instruments for progress. Bush devised "a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility." Moreover, on top of it there is "a transparent platen. On this are placed longhand notes, photographs, memoranda, all sorts of things". Because of the lack of digital support, he identified in "improved microfilm" the means for content storage and exchange: "contents are purchased on microfilm ready for insertion. Books of all sorts, pictures, current periodicals, newspapers, are thus obtained and dropped into place". Of course, he envisaged also support for knowledge discovery, access and management. Licklider realized that computers were getting to be powerful enough to support the type of automated library systems that Bush had described and in 1965, wrote his book about how a computer could provide an automated library with simultaneous remote use by many different people through access to a common database. Because of this, Licklider is also considered a pioneer of Internet and in its book he established the connection between Internet and digital library. Thus, it is not surprising that research and development activity on digital libraries started in the early 1990s, with the Internet proliferation, and that Internet has created unprecedented possibilities to discover and deliver human knowledge. The digital age has transformed how information is accessed and retrieved. Mobile devices and applications with wireless networking, high-speed computers and networks, and the computing cloud have deeply impacted and developed information science and information services. The evolution of the library sciences maintains its mission of access equity and community space, as well as the new means for information retrieval called information literacy skills. All catalogues, databases, and a growing number of books are all available on the Internet. In addition, the expanding free access to open source journals and sources such as Wikipedia has fundamentally impacted how information is accessed. Information literacy is the ability to "determine the extent of information needed, access the needed information effectively and efficiently, evaluate information and its sources critically, incorporate selected information into one's knowledge base,

use information effectively to accomplish a specific purpose, and understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.

2. Objectives

- To study the history of Digital Library
- To study the role of Digital Library about education
- To focus on work of Digital Library in modern education system
- To aware young generation about Digital Library its feature and management

3. Analysis and Results

The World Digital Library has stated that its mission is to promote international and intercultural understanding, expand the volume and variety of cultural content on the Internet, provide resources for educators, scholars, and general audiences, and to build capacity in partner institutions to narrow the digital divide within and among countries. It aims to expand non-English and non-western content on the Internet, and contribute to scholarly research. The library intends to make available on the Internet, free of charge and in multilingual format, significant primary materials from cultures around the world, including manuscripts, maps, rare books, musical scores, recordings, films, prints, photographs, architectural drawings, and other significant cultural materials. The WDL opened with 1,236 items. As of early 2018, it lists more than 18,000 items from nearly 200 countries, dating back to 8,000 BCE. After almost 20 years without participation; the United States re-established its permanent delegation to the United Nations Educational, Scientific and Cultural Organization in 2003. Google Inc. became the first partner of this public private partnership and donated $3 million to support development of the World Digital Library in 2005. The World Digital Library was launched on April 21, 2009 at UNESCO headquarters in Paris, France. Large scale digitization projects are underway at Google, the Million Book Project, and Internet Archive. With continued improvements in book handling and presentation technologies such as optical character recognition and development of alternative depositories and business models, digital libraries are rapidly growing in popularity. Just as libraries have ventured into audio and video collections, so have digital libraries such as the Internet Archive. Google Books project recently received a court victory on proceeding with their book-scanning project that was halted by the Authors'

guild. This helped open the road for libraries to work with Google to better reach patrons who are accustomed to computerized information.

In India on 19th June 2018 marked a milestone in the history of education in India with the formal launch of the National Digital Library Educational materials are available for users ranging from primary to post-graduate levels. NDL has been designed to benefit all kinds of users like students, teachers, researchers, librarians, library users, professionals, differently able users and all other lifelong learners. Information can be personalized based on the education level, choice of language, difficulty level, media of content and such other factors. This is thus like a 'customised service' provided in a 24x7 integrated environment where learners can find out the right resource with least effort and in minimum time. Repository hosts contents from multiple subject domains like Technology, Science, Humanities, Agriculture and others. More than 60 types of learning resources are available - books, articles, manuscripts, video lectures, thesis, etc. Items are available in more than 70 languages. Repository integrates contents from different Indian Institutional Repositories.NDL is the Single Window Platform that collects and collates metadata from premier learning institutions in India and abroad, as well as other relevant sources. It is a digital repository containing textbooks, articles, videos, audio books, lectures, simulations, fiction and all other kinds of learning media. It makes quality learning resources available to all learners and has 1.7 Crore content from more than 160 sources, in over 200 languages. The Mission aims to extend computer infrastructure and connectivity to over 25000 colleges and 2000 polytechnics in the country including each of the departments of 419 universities/deemed universities and institutions of national importance as a part of its motto to provide connectivity up to last mile. LAN of up to 400 nodes on average has also been envisaged to be provided to the universities under the NMEICT scheme. The Mission, in addition to utilize the connectivity network of service providers, shall explore the possibility to provide connectivity utilizing Very Small Aperture Terminal (VSAT), Virtual Private Network (VPN and EduSat channels.

Features of Digital Libraries

- **No Physical Boundary**: The user needs not to go to the library physically. People from all over the world can access the same information.
- **24/7 access:** A major advantage of digital libraries is that people can gain access 24/7 to its information.

- **Multiple Accesses**: The same resource of digital libraries can be used simultaneously by a number of institutions and users.
- **Access to a large amount of information:** It provides large amount of information to access the resources.
- **Information Retrieval:** The user is able to use any search term to search the entire collection. It provides very user-friendly interfaces, giving clickable access to its resources.
- **User-friendly interface:** It meets the demands of multiple users to access the system over the internet at the same time.
- **Preservation and Conservation**: For physical collections, digitization not a long term preservation solution, but succeeds in providing access copies for materials that would otherwise fall to modification from repeated use.
- **Space**: Traditional libraries are limited by storage space but digital libraries have the potential to store much more information. Digital information requires very little physical space to contain them. Also, media storage technologies are more affordable than ever before.
- **Easily Accessible**: Anyone can access the digital library from any place at any time.
- **Client server architecture:** Digital libraries provide support to their clients who can be accessed with common desktop configuration and software.
- **Network accessibility:** Online library system is a collection of disparate system and resources connected through a network.
- **Access to primary information sources:** They provide a wide range of information to the users in digital form.
- **Support multimedia content:** This system supports the multimedia content.

Importance of Topic-

The IT has almost converted the whole world into a global village. The revolution in the IT sector is influencing the information industry at its peak and revolutionized

the concept of libraries where it has been used extensively to record, store, and disseminate the information in the digital form. Each and every library step by step shifts over to this dimension to meet the demand put on it.

A digital library is nothing but a large database of organized collection of information which is globally available directly or indirectly across a network and eventually acts as a portal site providing access to digital collections held elsewhere for the people who are working on hypertext environment. The term Digital Library has a variety of potential meanings, ranging from a digitized collection of material that one might find in a traditional library to the collection of all digital information along with the services that make that information useful to all possible users. In simple, a digital library is a library having all its holding in the digital form or in a form that can be stored, processed by the computer system. It is nothing but a large database for the people who are working on hypertext environment. It is a system of organized collection of multimedia, data that are globally available directly or indirectly across a network. So that the history and feature of digital library topic is very helpful in modern development of education.

Conclusion

Digital libraries are important sources of organized and stored information. The digital library also follows a good design structure which promotes flexibility, diversity, modularity and much more. For strengthening the educational capacity and building research capacity in less advanced countries, access to relevant information is of great importance. Levels of access to information and communication technologies vary from individual to individual, community to community, and country to country; this is referred to as the "digital divide". As the pace of the technological revolution increases, so does the digital divide? It is helpful to modern education.

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Re-engineering of Library Services in Academic Libraries

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Abstract: Re-engineering is very popular modern management techniques. Application of re- engineering is present day need. The current situation necessitates the academic libraries to re-engineering their traditional tools and work processes in order to make them more productive and effective. Re-engineering is very popular modern management techniques. Application of re- engineering is present day need. Re-engineering focused on dramatically improvement of quality and speed of work and to reduce its cost, fundamentally changing the process. It is technique to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world class competitors. This present paper provides detail account of re-engineering of library activities, how this technique is applicable in academic library and barriers in re-engineering of academic library system.

Keywords: Re-engineering, Need of Re-engineering in Academic Libraries, Re-engineering Plan for Academics Libraries, Re-engineering Academic Library Services, User Expectation from Library etc.

1. Introduction-

Today is the age of information technology. Information technology has brought significant changes in the library. Re-engineering is the need of hour in college library to reduce the gap between users expectations and actual service provided. Considering the importance of re-engineering in library and information services, it is necessary to rethink on this serious issue and how it will apply to the library for providing better services to fulfill multidimensional needs of the present patrons. It is important to remember that re-engineering is not just a question of adding technology. It is primarily a function of human resource management. If one group feels left out, then its negative reaction man endangers the success of the entire project. It is important that communication between various levels of staff, therefore, should be of the utmost concern to library management during the re-engineering period. Libraries have adopted the net as they do most new technologies, as a means to providing better service to their users. As the computerization is the need of hours for re-engineering of library information system and service, therefore the authority of the college library should give

proper importance in library computerization as well as the recruitment and training of professional staff for their libraries.

2. Meaning of Re-engineering-

Re-engineering means reorganization for the purpose of providing updated and improved services. The library reengineering means use of computer technology and information and communication technology to provide better services to the users and better working environment for the staff. The pressures to lower costs, reduce cycle times, raise quality and, in general, make workplace processes more productive & intensive. The term re-engineering was first introduced by Michael Hammer in 1990 at a Harward Business review article, 'Re-engineering Work: Don't Automate obliterate.' However,

1. **Hammer & Champy (1933)** says "Re-engineering is the Fundamental rethinking & radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service & speed."
2. **While as per opinion of Davenport (1933)** - "Reengineering is only the part of what is necessary in the radical change of processes; it refers explicitly to the design of new process. The term process innovation encompasses the envisioning of new work strategies, the actual process design activity & the implementation of the change in all its complex technological, human & organizational dimensions." The above definitions mostly stress on rethinking & radical redesign of processes & also on destroying the old ways of thinking & operating. Once the organization rethink, then that rethinking could be implemented by way of redesign. The purpose of the reengineering is to achieve dramatic improvement in the activities carried out by the libraries. Reengineering can increase speed of the activity. It could enhance accuracy of the of the work carried out. It could save the cost involved in processing work.

3. Research of Objectives-

1. To study need of Re-engineering in Academic Libraries.

2. To propose a step-by-step method for R-engineering Library & Information Services and sources for Academics Libraries.
3. To study benefit of Re-engineering Library Services to Library Users.

4. Research Methodology-

The current study 'Re-engineering of Library Services in Academic Libraries' is based on secondary data collected from different sources. The secondary sources are concerned they were accumulated from online databases, articles and books. The research method applied to the current study is descriptive research method.

5. Need of Re-engineering in Academic Libraries-

Re-engineering is very popular modern management techniques. Application of re- engineering is present day need. Following reasons points out the need for re-engineering in academic libraries is needed some have given below

1. To reduce the paper work of libraries.
2. To improve library services for better service, provide to users.
3. Due to information explosion.
4. Rapid development and implementation of Information and Communications Technology (ICT).
5. To change the existing library procedure and adopt electronic environment in a traditional library structure.
6. Due to increase the shape, size of collection and users.
7. To fulfill the demand of users and potential users in effective way.
8. To reduce the cost, time and staffs of libraries.
9. To fulfill multidimensional information needs of library users.
10. To cope the challenges posed by information explosion.
11. Reflects a more customer-focused approach.etc

6. Re-engineering Plan for Academics Libraries-

The Re-engineering plan for academics library has been framed within the following five steps-

STEP – I - Processes/Activities to be Re-engineered-

The Re-engineering team has identified the processes/ activities of the academics library that have to be re-engineered. These are as follows.

1. Physical layout/ Facilities of the academic library.
2. Academic Library Collection.
3. Manual Processes of library housekeeping operations.

STEP – II- Selection of Re-engineering Team-

For the successful re-engineering of Academics Library, a competent team of experts should be established in order to redesign the library & information services of Academics Library.

STEP – III- Status of Current Processes in Academics Library-

In most of the academics libraries maximum processes & in-house library operations such as acquisition, cataloguing, circulation, serials control & various reports are being done manually. Use of Information Technology for library operations is very less.

STEP – IV- Vision for the New Improved Process-

Following vision may be developed for the new improved process - **Vision:** "We are committed to provide an easy and ready access to the library resources for updating the knowledge base of students and staff. Our endeavor is to keep the users of the library abreast of the state-of-the art inputs in respect of Arts, Commerce & Science, so that, they can face confidently challenges thrown open by 21st century. We are streamlining our concerted efforts to build our library as an excellent center for disseminating information."

STEP –V- Actions Needed to Implement or Redesign the New Process Physical Layout/Facilities of the library-

In order to provide better services to users, the physical layout of the library may be made as follows –

1. Separate Stack Room.
2. Computer Laboratory with sufficient no of computers having Broad Band Connectivity.
3. Separate Reading Room for students and teachers with sufficient library furniture.

4. Separate Reference Section.
5. Reprographic section
6. Processing section
7. Independent cabin for Librarian and Asst. Librarian.

7. Benefits of Re-Engineering of Academic Libraries-

Re-engineering is beneficial to academic libraries some of given below-

1. Save the time of users and staffs.
2. Increase the usability of libraries and their resources.
3. Change in traditional practices which are replaced by using technology.
4. Satisfied the users to libraries services.

8. Drawback of Re-engineering of Academic libraries-

1. In re-engineering too many process at initial stage.
2. Improper knowledge of re-engineering and improper monitoring of Re-engineering process.
3. Non availability of resources and unsatisfactory appraisal system.
4. Unfavorable organization environment.
5. Fear of failure.
6. Wastage of time due to detailed process analysis.
7. Lack of employee's awareness.

9. Re-engineering Academic Library Services-

Following the major series developed after Re-engineering with the help of Information and Communications Technology (ICT).

1. **Automated acquisition-**

   Integrated library management software is very compatible with the automated acquisition of library documents. This take less time to procure of the documents orderings, receiving, billings, accessioning other relevant details can make easy.

2. **Cataloguing-**

   Cataloguing of every document is very easy and at a time multiple volume can be catalogues. Bibliographic information can be impart from the standard MARC (Machine Readable Cataloging) format database.

3. **Automated circulation-**

   If help to charging discharging maximum number of book to maximum number of patrons at less time. RFID (Radio Frequency Identification) technology is one of the best software used for this and self-check in antenna help on maintain most returned of the document.

4. **Easy stock Verification:** It is very easy to stock Verification with the help of RFID.

5. **Serials-** In case of serial once you entered the details next time only to update the issue number or volume number and which helps to create automatic indexing of the article published.

6. **Create E-Book Server-** Libraries are typing to create an e-book server by collecting E-book as well as physical books.

7. **Institutional Repositories-**This provide, as access through publication and other resources. For collecting, preserving and disseminating in digital form Institutional repository is an online locus.

8. **Online Journals-** Now the concept of e-journals is going on. So, e-journals are new trends of library resources e-journals are subscribed and through consortium.

9. **Library Own Webpage-** Library owns webpage is a major source of information of the library. So big us development on own page of their library.

10. **ETD Lab-** Most of the higher academic institutions had developed electronics thesis and dissertation labs. Electronic format of thesis and dissertation open accessible to all.

11. **Digital Reference Services-** Reference Services now changes to digital reference services. Any kind of information can be retrieve from the digital reference sources. E-mail, SMS, Social networking, Google chat etc.

12. **Re-engineering the User Services:**

    The work of user services has to be thoroughly re-engineered on the lines of consortium and electronic document delivery system. The procedures for all user services such as compilation of bibliographies, current awareness service, selective dissemination of information, photocopying, other documentation services, CD based and online database service have to be re-defined and need total revision.

13. **Re-engineering the User Education-**

    The user education programmes need to be more technology oriented. Such programmes should be able to impart minimum theoretical and practical knowledge about computer, printers, scanners, network-based systems, search software of different database vendors, Internet search engines and services, web browsing, downloading, e-mail data copying to CDs and DVDs multimedia applications, computer viruses, etc. The orientation and training should be designed in such a way to providing confidence in locating and using the required and authentic information easily.

14. **Reengineering the Human Resource Development-**

    The aspect of re-engineering with regard to the human resource development is mainly concerned with the areas of staff selection, orientation, training technology adoption, work study, change management and motivation. The technologies, methods and procedures, used in the Library and information. Systems are more dynamic and changing as compared to many of the other information professionals are reluctant to change. This also contributes to the low performance in the profession. This situation stresses the need for a total revision of the Human Resource Development policies of the Library and Information Science.

    In order to prepare professionals and other staff in the libraries, Continues Education programmes should be conducted regularly. The course contents and training should be evaluated and reviewed frequently. The compulsory orientation and refresher courses conducted by the UGC for the library professionals/ teachers in the UGC Cadre have helped to improve the situation.

15. **Reengineering the Financial Process-**

In modern libraries, the stress is more on electronic resources. So, more money has to be set apart for purchase and maintenance of hardware and software system and Internet connectivity than the conventional pattern of spending for large buildings, furniture, books, journals and binding. Moreover, in consortia system, lot of work of acquisition, processing and services will be centralized. Hence, a substantial portion of the fund will have to be either deviated or pooled for consortium. This will need revision in budget process and financial management.

10. User Expectation from Library-

These are verbatim responses by patrons who were asked what they their libraries -

1. Everting in full text and downloadable or printable.
2. Faster service.
3. 24 x 7 Service availability.
4. Several options/alternative to choose from.
5. Everything should be in electronic format.
6. Easy access.
7. A librarian with knowledge of all subjects and all databases.
8. User friendly web resources permitting self-service.
9. Web site search engine that can find what I want.
10. Web site that works.

11. Conclusion

In conclusion, academic library should be developed as per the today's trend. With the help of ICT tools, library professionals can reshape the academic library services. It's one-time investment for the hardware and software. After one-time investment it will be reduced the cost.

Re-engineering has its origin in industrial organization where the profit making is the ultimate objective. Library is the non-profit making organization requires re-engineering in the mindset and behavior of the library staff. Considering the

importance of re-engineering in library and information services it is necessary to rethink on various library issues and how it will apply to library for providing better library services to fulfill multidimensional needs of patrons. As the computerization is the need of hours for re-engineering of library and information system and services, therefore the authority of the academic libraries.

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Digital Library Services and Information Product

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Abstract: The nonprofit organization like a library is basically engaged in the production of services rather than goods.

Library and information context involves many problems. Service are unique in nature primarily due to the attributes of being intangible, unbreakable, variable and perishable. this paper also suggest users' web workflow strengthen the library. Visibility librarians can be very effective in applying their skills to the marketing process in libraries.

Keywords: Marketing, Library , Services , Resources , Library and Information Branding.

1. Introduction

A Digital library will give traditional library a reform that will increase library visits by the users providing their information in digital from at computers.

Today is changing and extremely advancing technological environment requires everything to be advanced. Digital library will have no boundaries of time, space, geographical area, and racial discrimination between people for accessing the information. The concept of marketing being applied to libraries add a new dimension to the profession. The topic of marketing strategy for library resources and services is much more relevant to the when the area of marketing. Libraries are cable of offering their resources and services in a way that more users are able to access them with much ease and flexibility.

Recently, library and information services marketing has advanced countries. Library and information services culture, the difficulties of budget reductions, enhanced user base, information explosion, increasing expenses,

2. Marketing Strategis for Digital Library Services and Informations Products

2.1. Innovative Library Services :-

- Library –cum- Identity card along with blood group.

- Self check-in / checkout using RFID
- Campus wide (Residences, Hostels, etc.)access to E-resources
- OPAC SEARCH Facility for print and E-books of different publishers
- BPEL conducted a library survey – "my views-feedback on library ''for NITR users to collect the feedback about library services and its infrastructure.

Mobile Apps, Web 2.0 To 4.0 Outreach Services to the Users in the Digital Context

- **WEB 2.0** :- A contentious issue in using web 2.0 is intellectual property rights. Particularly copyright. Copyright law exists to protect an author or creators work and allow them to generate an income from that work web 2.0 is the term used to describe a variety of web sites and applications that allow anyone to create and share online information or material they have created.
- **WEB 3.0** : -
- **The Semantic Executing Web :-** This in turn leads us to the rumblings and mumblings we have begun to hear about web 3.0[…] by extending Tim Burners – Lee's explanations , the web 3.0 would be a ''read – write – execute" web however, this is difficult to envision in it' abstract form, so let's take a look at two things […]that will form the basis of the web 3.0
- **WEB 4.0** :-
- **"Mobile web":-** The next step is not really a new version, but is a alternate version of what we already have, web needed to adapt to it's mobile surroundings. Web 4.0 connects all devices in the real and virtual world in real-time.
- **7.PS OF LIBRARY MARKETING STRATEGIES** :- 7ps is general reference department product, product reference and ancillary services that add value such as personal assistance, referral services, internet database searches, distribution of documents and –bibliography loans.

3. Marketing Abilities of LIS

- Library staff requires the following professional understanding and abilities for advertising data and library services.
- Technical knowledge such as the capacity to used the internet.
- Perception of customer requirements and capacity to receive feedback from customers.
- Librarians and data researchers lack company knowledge.
- The casual approach in providing prospective customers with data.

4. Marketing Information Products in Digital Environment

The advent of the information age, where data supplied is an increasingly significant business activity, combined with fresh technological innovations combining previously disparate information supply operations, and has led to a shift in the role of libraries and librarians. Therefore libraries are finding fresh methods to serve customers efficiently because of increasing expectations. Varied needs and desires from library customers.

5. Need for Marketing Library Resources and Services

- Customers requirements
- Scarcity of resources
- Maintaining relevance
- Visibility
- Valuable community resource
- Rising expectations
- Survival
- Beneficial to library image.

6. Conclusion

Library and data services are regarded as sellable products in today's knowledge economy. More importantly, libraries have began to treat their usurers as clients. Marketing is an extensive word that defines all the procedures and interaction that lead to user satisfaction and data company income. The library should give

priority to provide excellent user services enhancing its images an information era.

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Theme-4

IPR, Professional Ethics and Social Networking

Social Medias: Skills To Manage, Purposes, Advantages And Their Role In Library Sectors In Digital Era

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ABSTRACT: Social media are interactive computer-mediated technologies that facilitate the creation or sharing of information, ideas, career interests and other forms of expression via virtual communities and networks. It helps user to use library in effectively. It allows user to create, connect, converse, to contribute, vote and share Information. It helps libraries to get closer to the users. It helps libraries in building collaborative network with the users. The expectations of social media in Academic libraries have been very high in the library field, and much advocated in Library 2.0 literature and using of various Social Media Networks. This Paper is mainly highlights for Social Medias and their role in libraries, Advantages, disadvantages, Challenges, Customer expectations, Future role of Librarians and so on in detailed.

Keywords: Social Medias, Role in Libraries, Advantages, Customer Expectations.

1. Introduction

Social media is used by libraries to deliver a blend of user service, news and updates, content/collection promotion, dissemination of the institutions' research output, provision of educational tools and resources and for building relationships both within and outside of the institution. A wide range of social media channels are used, but as yet there is limited differentiation between how they are used. Facebook, Twitter remains dominant, but visual channels such as YouTube is rapidly on the rise. It is clear that while the sophistication of social networking tools used and the frequency of updates are important factors in presenting a strong online presence, many agree that it is rather the quality and type of content posted, the defined goals and plans, and an alignment of the needs and expectations of the library users that leads to successful engagement.

Social networking sites are extremely popular across age groups and are central forums for accessing and sharing information. LIS Professionals are responding to the popularity of social networking sites and their expanding role in the creation, use, and sharing of information by engaging them as a central medium for interacting with library patrons and providing services to meet their information

needs. Especially in this digital Environment academic LIS professionals need a new branch of skill sets specific to utilizing and leveraging social networking sites to provide quality services and maintain their role as information experts in a Web2.0 world. The following competencies are a suggested set of skills that Academic LIS professionals should possess as social networking literate information professionals capable of implementing library services and utilizing information within social networking sites. These include skills for interacting with patrons within the sites, understanding and articulating the nature of social networking sites and their potential roles related to library services, creating presences and content, evaluating and applying information, and having the ability to assist patrons with gaining and applying these skills. Academic LIS Professionals possessing these skills are capable of efficiently and effectively navigating online social networking sites and applying their expertise to services with and within this now central realm for interacting with information.

1.1 Definitions:

- According to Computing Dictionary (2011), Social networking site as any website designed to allow multiple users to publish content of them. The information may be on any subject and may be for consumption by friends, mates, employers, employees just to mention a few.
- Boroughs (2010) stated that social networking websites allow users to share interests and communicate with others.
- Taylor-Smith & Lindner (2009) stated that wikis, blogs, chat rooms, instant messengers, message boards and social bookmarking are technology applications that have been used to facilitate members' interaction, and thus, have been referred to as social networking tools.
- Social media is the collective of online communications channels dedicated to community-based input, interaction, content-sharing and collaboration. Websites and applications dedicated to forums, microblogging, social networking, social bookmarking, social curation, and wikis are among the different types of social media.

1.2 Features of a Successful Social Media App:

- Ability to Expand User Following
- Ability to Extensively Customize Individual Profiles

- Choosing the Right Platform
- Ease of Connectivity. The entire point of **social media** is a way to bring internet users together
- Easy Integration With Other Social Media Platforms
- Notification and News Feed
- Privacy and Security
- Social media are interactive Web 2.0 Internet-based applications
- Social media facilitate the development of online social networks by connecting a user's profile with those of other individuals or groups.
- User-generated content, such as text posts or comments, digital photos or videos, and data generated through all online interactions, is the lifeblood of social media.
- Users create service-specific profiles and identities for the website or app that are designed and maintained by the social media organization.

1.3 Recent Trends & Developments:

- Collection Development to Content Development
- Conventional Education to Web-Based Education
- Conventional Vs Web Based Learning
- Establishment of Knowledge Commission
- Impact of ICT on Societal and National Development
- Impact of Information and Knowledge Society on Education, Training and Research
- Information Society-Knowledge Society
- Library Cooperation to Resource Sharing Networks/Consortia
- Library Professionals to Information Professionals
- Primary Focus on Professional Knowledge and Skills (Technology, Management and Communication)
- Recent Trends and Developments in LIS Education and Research

- Role of Information in Planning, Decision Making, Innovations and National Development
- Traditional Library to Digital Library

2. What's Hot Today?

- Being connected 24/7
- Cell phones & texting
- Faceted browsing
- Folksonomies
- Instant gratification
- Metasearching
- Open source ILS desktop applications
- OpenID or one-time
- Plugins, add-ons, & extensions authentication
- Social bookmarking
- Tagging
- Web applications replacing
- Wikis
- Blogs
- Citizen Journalism
- Fast delivery and vodcasting
- Gaming & virtual realities
- Mashups
- Online Photo sharing
- Open WorldCat
- Podcasting, screen casting
- RSS feeds & aggregators
- Social networking
- User comments and ratings
- Widgets and gadgets

2.1 What are Some Social Media Websites?

- **Social Bookmaking.** (Del.icio.us, Blinklist, Simpy) Interact by tagging websites and searching through websites bookmarked by other people.
- **Social News.** (Digg, Propeller, Reddit) Interact by voting for articles and commenting on them.
- **Social Networking.** (Facebook, Hi5, Last.FM) Interact by adding friends, commenting on profiles, joining groups and having discussions.
- **Social Photo and Video Sharing**. (YouTube, Flickr) Interact by sharing photos or videos and commenting on user submissions.
- **Wikis.** (Wikipedia, Wikia) Interact by adding articles and editing existing articles.

2.2 What are the Different Types of Social Media?

- Community blogs
- Discussion sites
- Image sharing sites
- Sharing economy networks
- Social networking sites. Most of us are familiar with social networking sites like Facebook, Twitter, and LinkedIn
- Social review sites
- Video hosting sites

3. Role Of Social Media In Library Sectors:

3.1 How Works Social Media In Library:

- **Blogs**: Here, librarians can periodically post messages; share information on a particular subject or issue, and allow users to contribute to content. They can write articles, news on topical issues and expect an instant reaction from their users.
- **Facebook:** Most popular now because it is librarian- friendly, with many applications like JSTOR search, World Cat, and much more. Librarians can interact with users to know their information need. Libraries try to link some of these specialized library applications to Facebook.
- **Flickr:** Librarians can use this tool to share and distribute new images of library collections. Cover page of new arrivals of both books and journals can be disseminated to users via Flickr. ν Library Thing: A tool that enriches the library OPAC. Once an account is created, a list of books with ISBNs is sent to Library Thing which sends back a piece of code which is pasted into the footer of the Library OPAC.
- **LinkedIn:** Librarians can get patrons connected with specialists in their particular field of interest via LinkedIn. Librarians can use this platform to render specialized services such as Strategic Dissemination of Information (SDI).

- **MySpace:** In Academic institutions where the students are; libraries have taken advantage of this site o post, calendar, custom catalog search tools, and blog features to improve their presence.
- **Twitter:** A micro blogging application, to keep staff and patrons updated on daily activities, like frequently updated collections. Users can utilize this platform to type in short messages or status update. Librarians can use this platform to give users firsthand information on the on-going national elections. Users can send Instant Messages (IM) on complaints or ask questions on a particular issue and get a feedback on the spot using twitter.
- **Wikis:** Is a free online encyclopedia that gives a background knowledge and definition of concepts. It offers a platform for users to access, edit and contribute to content. This is a collaborative web page for developing web content.
- **YouTube:** In institutions in India, events such as important highlights of inaugural lectures, conferences and workshops are disseminated via the YouTube.

3.2 Applications of Social Media In Libraries:

- **Blog –** we can use the blog features in Facebook to inform the users about – the new arrivals, most borrowed books, collection available in relation to an online event, core reference books for a course, most cited article in an area of research, statistics on the use of database, open access resources, etc., this will help the users to know about the collection and to comment on the postings made.
- **Developing User Database –** using the feature to create groups, libraries may have the students' profiles under different categories like undergraduate students, postgraduate students, faculty, staff, alumni, guests, (or as appropriate to the concerned library), etc.
- **Event Posting-** libraries can conduct online events in which users can share their thoughts. The World Book Day, Librarian's Day, Copyright Day, Social Media Day, Science Day, Father's Day, Teacher's Day, Mother's Day,

Friends Day, etc., celebrations of birth and death anniversaries of prominent authors, Institute foundation day, alerting the user about the upcoming institute events, etc., can be conducted virtually using this tool.

- **Instant Messaging System –** to answer user queries over chat. This will help to attend to reference queries. Further, this will help to attend to users beyond desk hours. The feature to indicate the 'status' (available, busy, online) will help to inform the users about the availability of library staff for providing services.
- **Posting Photographs –** posting the photographs relevant to the events, photographs captured during the institute events, student achievements, faculty achievements, memorable photographs of the yester years of the institute, etc., will attract the student community and help the library to archive the information over the time-line.
- **Providing News –** libraries can create alert system using Google Alert by giving Keywords related to Institute, subject domain the user community is interested, the hot topic in the news, etc. Selected alerts from these can be shared with the community. This will enhance the visibility of the library Facebook page.
- **Sending Virtual Gifts–**Facebook alerts us about the birthday, anniversary, and special occasion or about the student or faculty achievement. Libraries may send virtual gifts to these community members which make them to be part of library family. Such initiatives will bring librarians close to the community.

3.3 Implications of Social Networking Tools in Libraries

Social networking sits are helps library science professional to chunk information with colleagues and students in the easiest way for digital library environment. Library professionals can use in three broad categories in the field of library science services. These are:

- Information Communication
- Knowledge Organization
- Knowledge Distribution

3.4 Purposes of Social Media Usage in Libraries:

- Marketing of library product and services
- Marketing specific adult programs and services
- Marketing specific children's and youth services programs
- To modernize the library image and e-reputation
- To reach a new audience of potential users
- To push library news and press release
- To provide quick updates to users
- To build discussion groups and collaborative work
- To spread news and service alerts
- For fund raising

3.5 Skills to Manage Social Media

- Build a contingent of friends
- Follow and be followed in return
- Instruction sessions
- Link wherever possible
- Maintain communication
- Post pictures
- Respond to people
- Talk to people
- Community information
- Give it time
- Library news and events
- Links to articles, videos, etc.
- New additions to your collection
- Print advertising
- Solicit feedback

3.6 Benefits Of Social Networks In Libraries:

- Discern information breakdowns, bottlenecks, structural holes, as well as isolated individuals, teams, and units.
- Leverage peer support.
- To identify the individuals, teams, and units who play central roles.
- To improve innovation and learning.
- To make out opportunities to accelerate knowledge flows across functional and organizational boundaries.

- To raise awareness of and reflection on the importance of informal networks and ways to enhance their organizational performance.
- To refine strategies
- To strengthen the efficiency and effectiveness of existing, formal communication channels.

4. Social Networking - A Platform For Open Access to Knowledge

Social networking sites are constantly promoting open access to knowledge. Open access is the term used to refer to resources that are openly available to users with no requirements for authentication or payment. It is a model that presents free access to publications. In an open access platform, users are not charged for access to articles or other resources, and are free to read, download, copy, distribute, print, search, or link to full texts of these resources, provided they do not violet copyright rules, search, browse, filter, find, collaborate and have online open access to knowledge and contribute to web content.

4.1 Concepts of WEB 2.0

- Collaboration
- Ownership
- Personal data
- Radical trust
- Self-expression
- Transparency
- Wisdom of crowds
- Community
- Perpetual state of being in beta
- Personalization
- Remixable
- Sharing
- Web-based

5. ADVANTAGES & DISADVANTAGES OF SOCIAL MEDIAS:

5.1 ADVANTAGES OF SOCIAL MEDIA USAGE:

- For fund raising
- It helps libraries in building collaborative network with the users
- It helps libraries to get closer to the users.
- It is great way to grab the attention of new users

- Marketing of library product and services.
- Marketing specific student programs and services.
- Social media allows user to create, connect, converse, to contribute, vote and share information
- Social media capture potential users of the library.
- Social media facilitates knowledge sharing
- Social media helps in promoting distance learning
- Social media helps students in locating library resources
- Social media helps students to use library
- Social media helps to feed user with information
- Social media helps user to use library in effectively.
- Social media is integral to market library ν Social media capture potential users of the library
- Social media offers more than just traditional ways of marketing library services
- To build discussion groups and collaborative work.
- To modernize the library image and e-reputation.
- To provide quick updates to users.
- To reach a new audience of potential users.
- To spread news and service alerts.

5.2 Disadvantages or Problems of Social Media Usage:

- Confidentiality of information
- Electricity failure
- Inadequate funding for libraries
- Inadequate library staff
- Inadequate training opportunities for library professionals.
- Lack of knowledge how to use it
- Lack of privacy and identity theft

- Lack of time to use social media
- Low interest of library professional in learning and utilizing social media.
- Management Co-operation
- Slow speed of Internet
- Speed of Internet
- Too many social media tools to learn

6. Challenges Before Library Managers in Libraries

Library Managers are facing various Challenges. Some of them listed below;

- Availability of full-text materials on the Internet
- Better abstracting and indexing systems
- Better document delivery systems
- Changed users information behavior and reading habits
- Collection development
- Concept of 24 hours and 7 days library and information services
- Demand for web based products and services
- Demand for effective monitoring and feedback system
- Demand for quality based library and information products and services
- Demand for the creation of culture for creativity
- Diversity of programs and emerging thrust areas
- Emergence of library networking and networks
- Expectation for resource generation
- Explosive growth of electronic information and products
- Faster direct communication among scientists and researchers
- Impact of ICT on library practices
- Increased and diversified users information thrust and need
- Increased cost of information materials
- Marketing of library and information products and services

- Need for effective and efficient users interface
- Need for interaction with external environment
- Need for the development of information infrastructure
- Need to create specialized databases
- Need to develop sustainable collection building strategy
- New electronic information environment
- New roles and responsibilities
- New tools and techniques of information handling
- Philosophy of information at door
- Resource sharing through networking
- Responsiveness and dynamism in special library systems and services
- Timely delivery of information materials to end-users
- Virtual vs. onsite reference service: push and pull technologies

6.1 Our Mission Should Be

Based on above discussion and facts, Librarians need to re-orient and re-design their approaches and strategies to achieve the following objectives.

- Capture the Institutional best practices
- Create an institution's output
- Encourage open access
- Help libraries to meet the challenges of the digital world
- Increase an impact of research and development
- Manage learning materials
- Organize digitized collections and services
- Provide value added services to stakeholders
- Raise visibility/prestige of institution
- Utilization of information literacy

6.2 Future Roles of Librarians

- **Collaborative:** Social Network ensures knowledge sharing, establishes communication link with experts and allows users to develop a team working skill;

- **Contact Management:** Librarians can cross-link people and ideas among the conglomerate of different groups.
- **Context Awareness:** should be diversified in knowledge and able to link information to people's profiles. The important characteristics of social networking (SN) in libraries are:
- **Educative:** Users are kept abreast of the latest developments and can have open access to knowledge;
- **Expert Search:** The 21st century librarian should be an expert in web navigation; able to find friends of friends, and potential library users with common interest.
- **Fascinating:** It is inspiring, interesting and users can be engrossed in the use of social network sites; some users garner information with these sites in an easy and unencumbered manner
- **Flexibility:** Easy content creation and sharing, easy to update files and personal contact.
- **Identity Management:** Librarians should be able to examine profiles of users to mirror their information needs and match them with the library collections.
- **Network Awareness:** Should be able to share views and create awareness of the different social network sites and their uses.
- **Participatory:** Users have the opportunity to actively engage in the construction of knowledge rather than being passive consumers of content;

7. Conclusion

- Organizing a public awareness forum such as library orientation, conferences, symposia, workshops to create awareness and educate librarians and users on the social networking services and applications.
- Embracing current change in order to remain relevant and adapt to the new ICT driven environment.

- Imbibing a maintenance culture so as to manage the few available ICT facilities effectively.
- Provision of stable power supply will encourage and facilitate the effective use of these tools.
- Librarians need to develop domain knowledge to understand their clients
- Librarians, users and systems developers alike must cope with the changing and emerging technological environment to adequately respond to user needs
- Libraries promote reading which results in scholarly communication, knowledge creation and enlightenment.
- Libraries provide an economically efficient method of organizing information and knowledge that are relevant to our needs.

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Strategies of Human Resource Management in the University Libraries of Telangana State in Digital Era

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Abstract: The main objective of the study is to find out the strategies of Human Resource Management in the University Libraries of Telangana State. The study also focuses on performance appraisal, working conditions and needs of the training programmes to the library staff. The study was conducted through structured questionnaire administered to Library Staff. 27questionnaires were received. 74.1% of them accepted that the University Library officials give a good treatment with utmost respect. 77.8% of library staff shown interest to work in the late hours. 55.7% of the respondents stated that performance appraisal conducted on regular interims. 81.5% of respondents opined that the library staff to be encouraged to participate in various seminars/conferences and workshops to improve their skills.

Keywords: Human Resource Management, Strategies, University Libraries, Digital Era

1. Introduction

Human Resource Management (HRM) in University libraries has shifted tremendously in digital era. HRM includes performance appraisals, motivation of employees as well as changes in the attitudes and skills towards information handling. University Libraries are now being challenged by a new environment which demands changes in the attitudes and skills towards information handling. The dynamic structure of the University library within the higher education community creates complex environments for the librarian. The traditional approaches to information processing and organization are being changed due to the rapid change in the Information Communication Technologies, electronic resources, digital libraries, and telecommunication networks have to develop a balanced view of tradition and modernity in information handling.

University Library needs to organize and manage the resources in relation to the information use, behaviour and requirement of the users. University Libraries have its own managerial and administrative criteria to achieve goals and needs to meet the students and faculty needs in order to ensure better functioning and smooth running of academic libraries. The success of the library services depends on the level of awareness and effective use of information products and its organization. In order to achieve greater accuracy in processing the information a quality management is necessary. The purpose of information transfer process is to enable the management at all levels to solve problems and to make decisions. University Librarian who is an information transfer-agent should identity the information needs of the user so as to increase efficiency and effectiveness of information flow.

2. Need for the Study

The study attempted to find out the strategies of human resource management for university libraries of Telangana state. In these libraries various kinds of professionals help the students, research scholars and teaching community for their academic and research work. There is little research done in this area. There is need to find the research gap of Human Resource Management Strategies in University Libraries of Telangana State.

3. Objectives of the Study

1. To find the various strategies of human resource management in university libraries
2. To find out the performance appraisals of library professionals
3. To find out the working conditions of the library professionals
4. To find out the need and development of training programmes to staff of the library

Hypotheses of the Study

1. There is no human resource management strategies are applied in university libraries
2. There is no performance appraisal of library professional

3. There is no good working conditions of the university library professionals
4. There is no need of the training programmes to the library staff

Statement of the Problem

The present study has been undertaken to answer the Strategies of Human Resource Management in University Libraries of Telangana State.

Scope and Limitations of the Study

The scope of the study is limited to the strategies of Human Resource Management in university libraries of Telangana state only.

4. Literature Review

Ramadevi V. (2017) assessed the human resource function at the university level and then evaluates the specific structures of the academic library within the institution. In this study the authors pointed the opinions of the respondents regarding the librarians work, working conditions, working culture, their salary, etc. **Devendra Kumar (2016)** discussed the management policies which are strategic planning, organizing, staffing, directing, coordinating budgeting must be formulated and the same should be implemented with an utmost importance. Michael **Crumpton (2015)** focused on the impact of human resource practices in a library setting, discussing several aspects, including the role of human resources when the library is part of a larger organization, along with information on how to identify strategic objectives that are expected and related to workforce issues. **Jakaria Rahman A.I.M. (2011)** explained on strategic HRM techniques in a digital library environment which may help policy makers to find out the ways in which they can motivate their employees and policy planners to know the requirement of staff needs in modern library context. **Mallaiah T.Y. (2008)** analysed the three strategic systems of library employees i.e., planning and development, involvement & empowerment and rapport of employees. He concluded that convenient physical, social, and psychological conditions of employees available at libraries have probable to enhance the job satisfaction of the library professionals. In this context, it is suggested that the library administration should shows proper, adequate and timely attention to the interaction.**Weerasooriya W.A. and Deshpande N. (2006)** discussed in their paper regarding the necessity of environmental analysis, internal and external to the libraries is emphasized for enabling the library managers to underpin why and what would be necessary for the effective use of human resources strategies for the university libraries.

5. Methodology of the Study

The simple random sampling method was used to collect the primary data. In this analysis 40 questionnaires were administered to the Library staff. 27 questionnaires were received during in the month of January and February 2020 The data is analyzed on the basis of simple statistical method using SPSS.

6. Data Analysis and Interpretation

Working Conditions of University Library Staff

The below table presents the working conditions of library professionals working in universities of Telangana state. The results reveal that 66.7% of them are expressed happy with the working conditions in the university libraries. The university library administration supports their staff working under their control if any problem arises while attending their job and its percentage is more than 60. A high percentage i.e., 74.1 of them accepted that the University Library officials give a good treatment with utmost respect. Tremendous responses were received from the library professionals, more than 3/4th of them (77.8%), shown interest to work at late hours also.

Table 1: Working conditions of University Library Staff

Sl. No.	Strategies	Strongly Agree	Agree	Un-decided	Disagree	Strongly Disagree
1.	Are you happy with the present working conditions in the University Library	2 (7.4%)	18 (66.7%)	0 (0.0%)	7 (25.9%)	0 (0.0%)
2.	University Library supports library staff facing any problems	1 (3.7%)	17 (63.0%)	4 (14.8%)	4 (14.8%)	1 (3.7%)
3.	In the University Library each employee is treated with genuine respect	3 (11.1%)	20 (74.1%)	3 (11.1%)	0 (0.0%)	1 (3.7%)
4.	Do you make suggestions for improvement of the library working conditions	2 (7.4%)	23 (85.2%)	1 (3.7%)	1 (3.7%)	0 (0.0%)
5.	Are you willing to stay at work till late	1 (3.7%)	21 (77.8%)	2 (7.4%)	1 (3.7%)	2 (7.4%)

Performance Appraisal of University Library Staff

The below table reveals 55.7% of the respondents stated that performance appraisal conducted on regular interims and they receive feedback on respondents' performance. To achieve the library goals, a high percentage (74.1%) of respondents were motivated collectively. A suggestion was made by the respondents with 55.6% responses to apply the performance appraisal system to all library staff.

Table 2: Performance Appraisal

Sl. No.	Strategies	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	Your performance appraisal will be conducted at regular intervals	2 (7.4%)	18 (66.7%)	4 (14.8%)	3 (11.1%)	0 (0.0%)
2.	Are you receive proper feedback on how you are performing	0 (0.0%)	15 (55.6%)	4 (14.8%)	8 (29.6%)	0 (0.0%)
3.	Are you motivated to work collectively towards achieving library goal	2 (7.4%)	20 (74.1%)	4 (14.8%)	1 (3.7%)	0 (0.0%)
4.	Performance appraisal system is extended to all library staff	1 (3.7%)	15 (55.6%)	3 (11.1%)	7 (25.9%)	1 (3.7%)

Training Needs of Library Staff

From the results shown in the above table, a high percentage 63.7% of respondents accepted that the training needs of the library staff are assessed on the basis of staff performance appraisal, which includes a 7.4% strongly agree and 59.3% agree statements. Highest percentage (81.5%) of respondents also opined that the library staff to be encouraged to participate in various seminars/conferences and workshops to improve their skills.

Table 3: Training needs of Library Staff

Sl. No.	Strategies	Strongly Agree	Agree	Un-decided	Disagree	Strongly Disagree
1.	The training needs of the library staff are assessed on the basis of staff performance appraisal	2 (7.4%)	16 (59.3%)	4 (14.8%)	5 (18.5%)	0 (0.0%)
2.	The library staff encouraged to participate in various seminars/ conferences and workshops	2 (7.4%)	22 (81.5%)	0 (0.0%)	3 (11.1%)	0 (0.0%)

Need of Training

The entire respondents in the present study felt there is a need for training on human resources in university libraries.

Table 4: Need of Training

Sl. No.	Strategies	Yes	No
1.	Do you feel there is a need for training on the Human Resources	27 (100.0%)	0 (0.0%)

Duration for Training

Table 5 shows that majority (21, 77.8%) of the respondents stated that the duration of the training required is 1-2 weeks, three respondents (11.1%) of them preferred for more than a week. A little percentage 7.4 and 3.7 of them preferred for 3 days and 5 days, respectively. So, the ideal duration of the training period is one-two weeks.

Table 5: Duration for Training

Sl. No.	Duration	Yes
1.	1-day	0 (0.0%)
2.	2-days	0 (0.0%)
3.	3-days	2 (7.4%)

4.	5-days	1 (3.7%)
5.	1-2 week	21 (77.8%)
6.	More than a week	3 (11.1%)

Mode of Training

The above table presents the respondents opinion on mode of training types, such as hands on experience, demonstration, lecture/presentation, handouts, audio-visual aids and online tutorials. A large number of respondents wanted to get training through hands on experience with a percentage of 70.4%, for demonstration of training mode 12 (44.4%) respondents shown interest, 30.7 per cent of them preferred for lecture/presentation of mode of training and an ideal number (8, 29.6%) of respondents chosen for hand-out training. A small number of respondents i.e., 2 (7.4%) selected two types of training i.e., audio-visual aids and online tutorials. Hence, this study shows that majority of the respondents expected to get training through hands on experience.

Table 6: Mode of Training

Sl. No.	Mode of training	Respondents' Frequency & Percentage
1.	Hands on experience	19 (70.4%)
2.	Demonstration	12 (44.4%)
3.	Lecture/Presentation	10 (30.7%)
4.	Hand-outs	8 (29.6%)
5.	Audio-visual aids	2 (7.4%)
6.	Online tutorials	2 (7.4%)

7. Findings

1. It is found that tremendous responses were received from the library professionals, more than 3/4th of them (77.8%), shown interest to work at late hours.
2. High performance appraisal was found among the respondents regarding motivation (74.1%), performance appraisal on regular basis (66.7%),
3. A high percentage 63.7% of respondents accepted that the training needs of the library staff are assessed on the basis of staff performance appraisal, proper feedback and extension of appraisal system to all library staff (55.6%).

4. It is found that all the respondents in the present study felt there is a need for training on human resources in university libraries and majority (77.8%) of the respondents required duration for the training programme is 1-2 weeks.
5. The findings of the present study also show that majority (70.4%) of the respondents expected to get training through hands on experience.

8. Conclusion

The human element is a very important aspect in implementing an automated system in the library. In the digital era, library and information professionals are still to be fully engaged in the provision of information services to organizations communities and to society at large. The library officials working at top level boost the morale among the employees. The library staff should encourage to participate in various seminars/ conferences and workshops to improve their right decisions at right time for successful functioning of the university libraries.

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Significance of Libraries in Controlling the Plagiarism

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Abstract: The multiplication of understudy counterfeiting is resembled by the expend addition to number of articles showing up in scholarly diaries introducing fluctuating conclusions on the theme. Suppositions run the range from shock at the understudy guilty parties to pointing fingers at employees who neglect to make unoriginality verification assignments. Individual in like manner gets some answers concerning questionable new systems for preventing in addition to distinguishing copyright encroachment, most very, online composed literary theft area structures. In studying the writing, one can build legitimate contentions for each perspective. This paper will investigate the issues related to the plagiarism, copyright infringement situation from an administrator's vantage.. Research is a unique in addition to methodical examination attempted to find new realities in addition to data about a phenomenon. This paper is talked about the literary theft, Students, Research Scholar in addition to Teachers can check investigate work through programming like, Turnitin, Ithenticate, Plagiarism Checker, Viper, Duplichecker, Copyleaks, Paperrater, Plagium, Plagiarisma, Plagscan in addition to so forth. The present examination has shown various strides of copyright infringement check in addition to furthermore how to stay away from duplication in inquire about yield. Potential components affecting understudy practices in addition to perspectives toward literary theft incorporate obliviousness, absence of individual interest in their training, situational morals, in addition to absence of reliable styles among in addition to inside different orders. Administrators are in an exceptional situation to help forestall in addition to identify literary theft by framing organizations with personnel to reconsider assignments in addition to instructional meetings in addition to by advising those regarding Internet paper plants in addition to valuable Internet search methodologies.

Keywords: Plagiarism, Plagiarism detection, Penalties for Plagiarism, Software

1. Introduction

Scholarly burglary incorporates copying material, whichever term as of term or by way of undersized illustration, as ofwhatsoever for instance records, to web goals, curriculum, verbalized otherwise pictorial demonstrations, test center information, computer assignments, or masterful works. Counterfeiting doesn't allude to words alone - it can likewise allude to duplicating pictures, diagrams, calculations, tables, in addition to thoughts. An "introduction" signifies more than composed work: it implies any technique by which you submit work to your teacher. In any event, interpreting crafted by someone else into another dialect without reference is unoriginality. Copyright infringement implies taking the words in

addition to contemplations of others (their thoughts, ideas, pictures, sentences, etc) in addition to utilizing them as though they were your own, without crediting the creator or referring to the source.

Or with a teacher or coach, yet when the genuine work is done; it must be finished by the understudy, in addition to the understudy alone.

The Oxford English Dictionary characterizes literary theft as "the unjust apportionment or purloining, in addition to production as one's own, of the thoughts, or the statement of the thoughts of another." In basic words "Any type of cheating, or literary theft, just as some other type of unscrupulous conduct, deliberate or not, identified with the abstention of addition, scholastic or something else, or the obstruction in evaluative activities submitted by an understudy is an offense under the Academic Code of Conduct. The UGC made the extraordinary stride in 2009.It commin addition to s accommodation of electronic variant of propositions by the analysts in University with a mean to encourage open access to Indian theories to the scholastic network around the world. Online accessibility of electronic proposals through halfway kept up advanced stores not just guarantees simple access in addition to chronicling of Indian Doctoral propositions however will likewise help in increasing the expectation in addition to nature of research. According to guideline, the obligation of facilitating, keeping up in addition to making the computerized archive of Indian Electronic Thesis called Shodhganga, in addition to Dissertation called Shodhgangotri open to all organizations in addition to Universities. E-Shodhshindhu gives access to e-assets to Universities, Colleges in addition to Centrally Funded Technical Institutions in India. It is a decent advance to improve the nature of looks into in nation in addition to maintain a strategic distance from any writing burglary by them. Many research papers distributed in the field of science in addition to writing each year; to check the credibility of these papers it is compulsory to check them in the literary theft location programming. Larger part of the Indian college buys the literary theft programming in addition to gives it to their University libraries, Departments, Faculty individuals, with the goal that they check the legitimacy of the articles, postulation/paper put together by the understudies.

2. What is Plagiarism?

There isn't such a specific meaning of written plagiarism. On the off chance that we check in the lexicon it gives the definition "A bit of composing that has been duplicated from another person in addition to is introduced similar to your own

work. Unoriginality incorporates the writing burglary as well as the information, realistic, music, expressions, artistic creations, music in addition to so on.

3. For What Reason Might Plagiarism Occur?

Counterfeiting wrecks profession life of researcher, staff in addition to understudies. Quite a while prior, understudies can't appear to know whether the paper they submitted contained copied content. All they knew was that they were at that point confronting the wrongdoing of written plagiarism. Unfortunately, they don't approach free counterfeiting checker like Plagiarisma, Turnitin, Copyleaks in addition to so on. Today, researchers can address in addition to alter comparable figures of speech in the wake of filtering their reports with hostile to copyright infringement programming. Instructors additionally will discover the device diminishing the weight of returning examination works in addition to recording bodies of evidence against understudies for copyright infringement.

4. There are Numerous Reasons why Researchers in Addition to Understudies Steal, for Instance

- When an understudy isn't completely mindful of what counterfeiting is.
- When an understudy doesn't completely comprehend the shows required in scholarly composition.
- It can be a frenzy reaction to poor time the board when an exposition cutoff time is approaching:
- If an understudy feels a urgent need not to be viewed as a disappointment thus duplicates to attempt to guarantee 'achievement.
- It can be a reaction to various scholastic conventions.
- It can be a reaction to data over-burden in addition to the simplicity with which content can be reordered from the other electronic archives or pages on the Internet.
- It can be an endeavor not to disappoint a coach.
- The understudy may duplicate out content in exactly the same words during note-taking in addition to afterward neglect to rephrase & redraft the content for the task.

5. Positive Reasons for not Plagiarizing

5.1 Superiority in One's Work

Researchers in addition to understudies ought to have the option to invest heavily in their work in addition to in the accomplishments they have achieved. There is extensive fulfillment in realizing that we are building up our composing aptitudes, the work we have submitted is our own, all assets are suitably recognized, in addition to the imprints got mirror our own exertion in addition to capacities.

5.2 Knowledge

It won't be conceivable to adapt appropriately in the event that we are not finishing the necessary course work appropriately. For instance, in the event that we are required to compose an exposition or writing survey, we won't simply find out about the subject, we will likewise be building up an entire scope of capacities, for example, writing looking, time the board, association, investigation, assessment, creating rational contentions, referencing in addition to scholarly composition. It is substantially harder to build up these parts of scholarly examination without rehearsing them in addition to getting mentor input. Finishing our assignments furnishes us with a significant chance to find out about your order zone in addition to impart our comprehension to other people.

5.3 Genuine Level of Attainment

It is conceivable (albeit improbable) that somebody may steal broadly in addition to not be found all through their University vocation. Nonetheless, the disclosure that their evident fulfillment doesn't coordinate their genuine capacities may then become clear when they get a new line of work. It does not merit the hazard in addition to stress this could cause.

6. Plagiarism Detection

Written plagiarism discovery is the way toward finding examples of copyright infringement inside a work or record. The across the board utilization of PCs in addition to the approach of the web has made it simpler to copy crafted by others. Most instances of copyright infringement are found in the scholarly world, where archives are commonly articles or reports. Be that as it may, written plagiarism can be found in practically any field, including logical papers, workmanship structures, in addition to source code. Recognition of literary theft can be either manual or programming helped. Manual discovery requires considerable exertion in addition to brilliant memory, in addition to is illogical in situations

where such a large number of reports must be thought about, or unique records are not accessible for examination. Programming helped identification permits tremendous assortments of records to be contrasted with one another, making fruitful location significantly more likely.

7. How to Avoid Plagiarism?

Literary theft is a developing issue, about which schools, schools in addition to colleges are progressively concerned, when you compose an exploration paper, you need to clarify where you got your data. A portion of the thoughts you use will be your own, however many will have originated from data you have perused or individuals you have met about the subject. To clarify where the data originates from, you need to give (refer to) the source accurately. Be cautious about requesting that somebody survey your paper, or if any editorial manager changes your paper substantively. One of the best methods for starting to maintain a strategic distance from school, school or college unoriginality is to be increasingly cautious when taking notes, look into ventures. It is so natural to be imprudent with note-taking, particularly when you are in a surge or when you have set out on a long bit of work, for example, a proposal or thesis in addition to research paper, where innovation is fundamental.

8. Softwares for Plagiarism Checking

There are numerous open access, free in addition to paid programming for checking the unoriginality some are referenced underneath: -

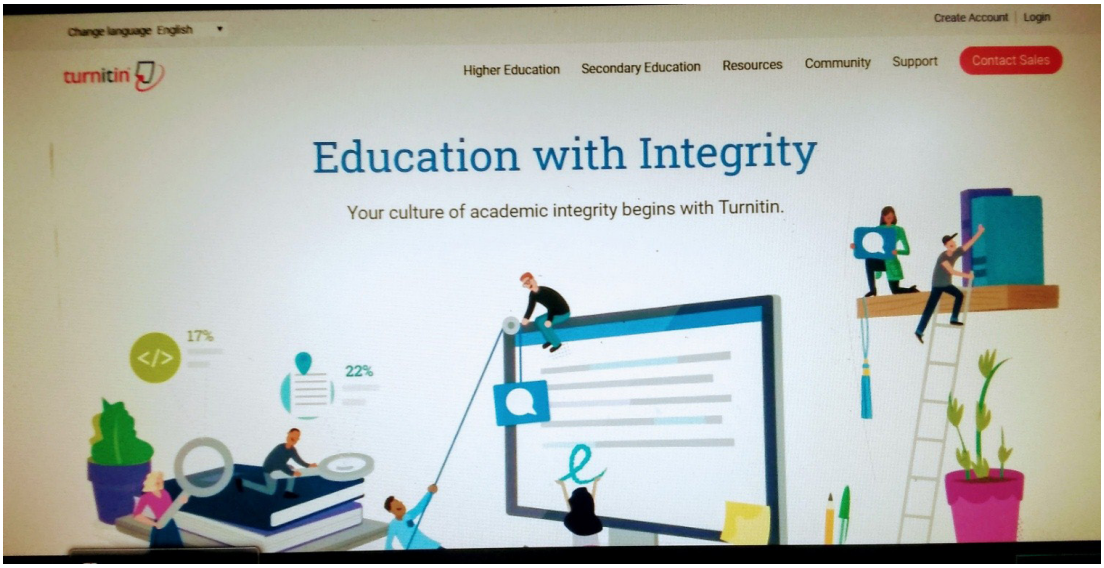
8.1 PlagTracker

This is a Ukrainian online counterfeiting discovery administration that checks whether comparative content substance shows up somewhere else on the web. It was propelled in 2011 by Devellar. PlagTracker is utilized by content proprietors (understudies, instructors, bloggers, in addition to analysts) to distinguish instances of "content burglary", in which substance is duplicated, without the consent of the creator or proprietor, from one website to another. Many substance distributers additionally use it to recognize instances of substance misrepresentation, within this old substance is repackaged in addition to sold as new unique content.

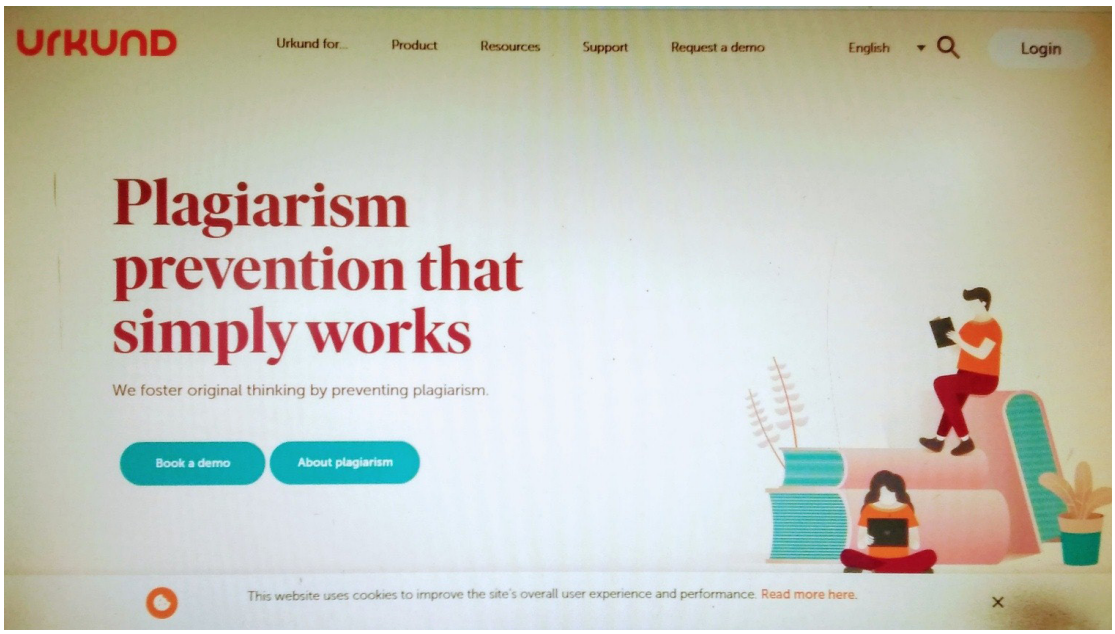
8.2 TURNITIN (www.turnitin.com)

In 1998 it was established by four UC Berkeley understudies, it gives creativity checking, web based evaluating, in addition to companion audit into a solitary

help, a considerable lot of Institutions in addition to Universities utilizing Turnitin to improve the nature of hypothesis examine.



turnitin



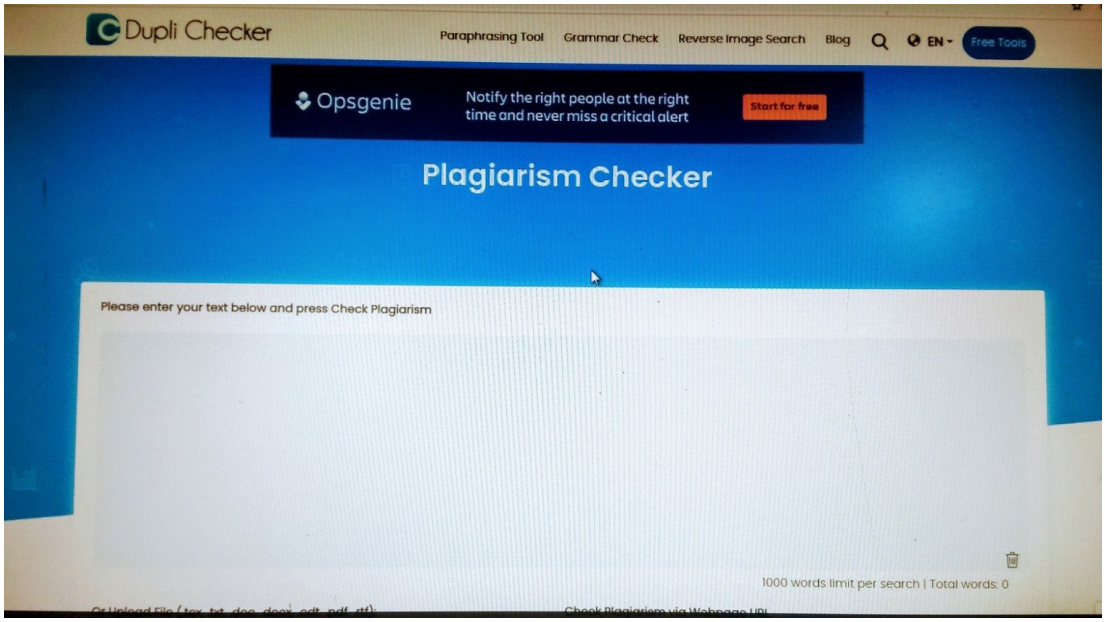
Urkund



PaperRater



PlagTracker



Dupli Checker

9. Consequences or results of Plagiarism

The results of copyright infringement can be close to home, proficient, moral, in addition to legitimate. With literary theft discovery programming so promptly accessible in addition to being used, liars are being gotten at a disturbing rate. When blamed for counterfeiting, an individual will in all likelihood consistently be respected with doubt. Obliviousness isn't a reason. Results of literary theft include:

- **Smashed Student Status:**-Unoriginality claims can make an understudy be suspended or removed. Their scholarly record can mirror the morals offense, potentially making the understudy be banned from entering school from secondary school or another school. Schools, universities, in addition to colleges pay attention to unoriginality very.
- **Bad effect on originality**:-An expert agent, government official, or open figure may find that the harm from literary theft tails them for their whole profession. Not exclusively will they likely be terminated or requested to step down from their present position, yet they will without a doubt think

that its hard to get another good activity. Contingent upon the offense in addition to the literary thief's open stature, their name may get demolished, making any sort of important vocation outlin addition to ish.

- **Destroyed Academic Reputation**:-The outcomes of written plagiarism have been generally revealed in the realm of the scholarly community. When scarred with written plagiarism claims, a scholastic's profession can be demolished. Distributing is a necessary piece of a renowned scholastic profession. To lose the capacity to distribute undoubtedly implies the finish of a scholastic position in addition to a devastated notoriety.
- **Legal Repercussions**:-The legitimate repercussions of unoriginality can be very genuine. Copyright laws are supreme. One can't utilize someone else's material without reference in addition to reference. A creator has the privilege to sue a copyright infringer. Some literary theft may likewise be considered a criminal offense, perhaps prompting a jail sentence. The individuals who compose professionally, for example, columnists or creators, are especially defenseless to unoriginality issues. The individuals who compose every now in addition to again should be ever-watchful not to fail. Authors are very much aware of copyright laws in addition to approaches to maintain a strategic distance from written plagiarism.
- **Monetary Repercussions**:-Numerous ongoing news reports in addition to articles have uncovered counterfeiting by writers, writers, open figures, in addition to scientists. For the situation where a creator sues a copyright infringer, the creator might be allowed financial compensation. For the situation where a writer works for a magazine, paper or other distributer, or regardless of whether an understudy is found stealing in school, the culpable copyright infringer could need to take care of money related punishments.
- **Plagiarized Research**:-Counterfeited inquire about is a particularly horrifying type of written plagiarism. On the off chance that the exploration is clinical in nature, the outcomes of copyright infringement could mean the loss of people groups' lives. This sort of unoriginality is especially shocking.

10. Conclusion

To check the legitimacy of the exploration papers in addition to Theses it is constantly a difficult part. Writing robbery happens likewise in past years yet nobodies think about that. This is the time of Information innovation, PCs are the most significant disclosure of the twentieth century, in addition to with the revelation of web it turned out to be all the more impressive. Presently numerous things we got on the web. They are anything but difficult to utilize, anyone can fasten in addition to get the pertinent data, however with the upside of ICT there are some drawback additionally, in addition to anyone can utilize these online data to their reports. To check this writing robbery literary theft identification programming is must for each organization in addition to Universities. Typically distributers utilizes the product to check the paper before the distributing it. Presently scholastic organization utilizes a lot of programming for checking the trickery.

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18. http://en.wikipedia.org/wiki/Theory_of_planned_behavior

19. https://smallseotools.com/plagiarism-checker/

20. http://www.quality.stir.ac.uk/documents/BookofPlagiarism.pdf

21. https://ori.hhs.gov/definition-misconduct

Exploring Scientific Collaboration Through Academic Social Networks

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Abstract: This article deals with academic social networks (ASNs), which helps researchers, academicians to create their profile and upload their scholarships. It discusses four ASNs and the tools available for collaboration like discussion boards, file repository, email, instant messaging, citation count, almetrics, public /private profile, group collaboration, reference management, collaborative document processing, network visibility and sharing the scientific output, which were made available free or upon request they are given. It also discussed by taking an example of ResearchGate and Academia.edu for the creation of account and compared some of the features among themselves. Mendeley, the reference social networking tool helps the researchers to search for more relevant documents, which helps them by saving their valuable time and creates a tendency to collaborate with the authors of the articles, whenever needed. LinkedIn helps to share the resources and helps for finding jobs and doing courses. Some of the challenges faced by the users are like collection of relevant articles, quality of data and metrics on the ASNs. LIS professionals should consider giving the wider publicity for the use of ASNs. This facilitates the researchers / academicians to have collaboration and indirectly the resource sharing activity among themselves.

1. Introduction

In 21st century the communication is faster, better and efficient and the credit goes largely to technology. A new paradigm has revolutionized informal communication channels: social media, now an extremely popular communication tool and the most common activity carried out via the Internet for most individuals worldwide. Social media facilitate the procedures of accessing, communicating, and sharing information, knowledge and resources with others and easier to access and operate. As these new channels are extremely useful resources for scholars and academic work, access to them should be easy and convenient. All internet users' primary purposes for going online are for communication and socialization. Social Networking Sites (SNSs) are the example of techno-oriented communication with other users about areas of mutual interest, whether from a personal, business or academic perspective (Merten and Williams, 2009).

Peer-reviewed conferences and journals have traditionally been the focus of researchers' efforts to make their research visible. However, as social media becomes more prevalent, the way academics disseminate their research is changing. Academics are increasingly using social media and regarded social media as a new way to be more visible and to have their research discovered by peers (Kelly & Delasalle, 2012). Academic Social Networking Sites (ASNs) offer its own combination of tools and capabilities to support research activities, communication, collaboration, and networking. Given their variety, it might be challenging for academics to evaluate and use them. This paper as a challenge explores the services and tools of selected set of ASNs, look at how they compare to each other, identify their commonalities and differences, in order to help researchers', make informed decision and study the characteristics and tools.

2. Definition

Academic Social Networks (ASNs) is a web-based service that allows individual researchers to maintain identity by creating a public or semi-public profile within a system, facilitate communication by sharing a list of other researchers in connection, to enable information sharing with other researchers in the system, and simplify collaboration with other researchers of the system (Bullinger et al., 2011). Some examples of ASNs are Academia.edu, ResearchGate, LinkedIn, Mendeley and Zotero.

3. Literature Review

A thorough knowledge of related literature is important for both quantitative and qualitative studies to identify and evaluate relevant articles to be cited and used as landmark of any new works (Ary, Jacobs & Sorensen, 2009). Researches previously carried out are the starting point from which to proceed towards new findings. However, it is tough to identify all articles relevant to a given topic, even if following a systematic literature search method, and so scholars use a finite set of searches and other methods in order to identify relevant researches (Thelwall & Kousha, 2015; Haines et al, 2010). According to Haines and colleagues (2010), researchers use a variety of information resources ranging from popular Internet search engines to specific databases. The aim is generally to identify more papers as possible using a set of keywords, in the hope of not missing relevant ones. Scholars usually use a finite set of searches and other methods in order to identify relevant works unlike what routinely occurs in the development of systematic reviews or meta-analyses. A specific function is carried out by social network sites (SNSs)

that are largely diffused nowadays. Their success depends by the opportunity that they offer to build and nurturing friendships as well as professional relationships. Well-known SNSs posed their achievement on some specific communication or sharing functionality: Facebook emphasises on moods and life scraps, LinkedIn on professional knowledge, Twitter on speedy widespread messages, Instagram on charming pictures, Scribd on documents, SlideShare on slides and presentations. Therefore, the ASNs like Academia.edu, LinkedIn, ResearchGate, Mendeley, etc. have come into existence, which are mostly used for professional activity and the research is being shared / marketed to friends, colleagues at national and international level, as free or upon request it is shared.

ASNs allows group of two or more researchers to work in a professional online environment together. One of the reasons for using ASNs by researchers in academic institution is collaboration among researchers (Banmeke and Oose, 2012). While research institutes and universities have the facility of connecting with each other, it is still very problematic to reach out to their target audience particularly those which are in the geographically dispersed region. It is, however, appropriate for researchers of the developing nations to explore and become acquainted with this kind of collaboration technology as it can allow access to the current research trends or latest issues in their field of work. This can result in an enhanced quality of research output. Moreover, it can enable researchers to maintain relations among the researchers as it will provide their expertise and help mentor other researchers around the globe (Banmeke and Oose, 2012). Nandez and Borrego (2013) explored the usage patterns of Academia.edu and the results show that users were young. Similarly, Thelwall and Kousha (2014) focused their study on Academia.edu and examined whether it is principally used as a general SNS, such as Facebook, for instance, in which case younger female users should be more active and over-denoted. A recent study by Jordan (2014), aimed at exploring whether the structure of academic communities is alike among different ASNs. The study revealed several positions within the network varies according to "academic seniority". Salahshour and others (2016) revealed that academic position has an effect on ASNs use. Hence, their findings suggest more senior academics will have more connections and occupy a more valuable position within the junior ones.

A study conducted by Procter et al. (2010) revealed that one of the factors that has effect on use of SNSs among researchers is experience. Bullinger et al. (2011) explored that the degree of experience with social software and web-based tool has effect on academic researchers use behaviour. These tools provide simple features to describe researchers' institutional information and interests, promote

the uploading and sharing of research documents between members, calculate publication analytics and allow users to post public questions to the community. As LinkedIn is used for professional communication and career networking, these systems provide support for scholars and researchers in activities like sharing news, reports, papers and data sets. A mission that explicitly Academia.edu declares on its web site is 'to accelerate the world's research linking academics each other'. A series of articles analysed size and relative popularity of ASNs.

4. Overview Of Popular Academic Social Networks (ASNS)

This article discusses four ASNs, which are mostly used by the academics, researchers and others. They are Academia.edu, ResearchGate, LinkedIn and Mendeley. It is to identify some of the common characteristics and the collaboration tools among them.

4.1 Academia (www.academia.edu)

Academia.edu established in 2008 in San Francisco by Richard Price as part of the Open Science movement, defines its goal as encouraging and stimulating the publication of studies (Shema, 2012). Academia is a platform for sharing academic research. Academics have uploaded 22 million papers, and 138 million academics, professionals, and students read papers on Academia every month as on 31st January 2021. It is reported that it has more than 31,000,000 registered account-holders (https://www.academia.edu/about). Academia.edu includes an analytics dashboard by which users may see the influence and diffusion of their studies in real time (Price, 2012). Academics use Academia.edu to share their research, monitor deep analytics around the impact of their research, and track the research of academics they follow. It has an alert service that sends account holders an e-mail whenever a researcher whom they are following publishes a new study, allows readers to tag articles, and alerts anyone who is following a certain topic. In this way the alert system is raising awareness to an article by potential citators.

Academia.edu has an interface with Facebook and Google so that one can connect through yet existing profiles. One can bookmark papers, get updates about new paper added in his /her field of research and related fields via academia.edu (Sample Figure 1). Analytics section will show details of visitors to your papers over last 30 days. One can generate a CSV export that has data about all the visits to the profile and papers. This can be used with a spreadsheet program for further data analysis. An important tool that Academia.edu offers is the statistic of downloads and page views; it also allows you to know what keywords people use

to search for you on Google. Suggested scholars' section will enable you to connect to associated scholars and peers in your and related field of interest (Academia.edu, 2014). Scholars can upload various documents including publications and a CV, join conversations in scholarly communities and select from a range of interests to follow (Thelwall and Kousha, 2014).

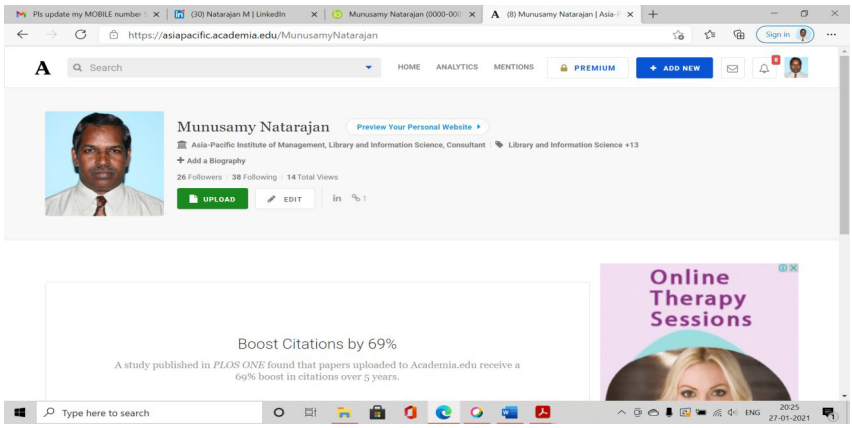


Figure 1: Sample page of academia.edu

Academia.edu has a business model with a premium subscription service. People can pay $100 a year to upgrade to a premium account. This includes features such as:

- Mentions (knowing who is mentioning you)
- Bulk Download (being able to download lots of PDFs at once)
- Advanced Search (searching the full-text of papers on Academia.edu)
- Summaries (the summaries product mentioned above)
- Grants (accessing a database of grants on Academia.edu) and other features.

225,000 people have become Premium subscribers. The company is profitable. The company has 53 people, most of whom are software engineers, product managers and designers. Everyone is based in San Francisco.

LinkedIn.com (www.LinkedIn.com)

LinkedIn, business-oriented social networking Web site founded in 2002 and headquartered in Mountain View, California. It is a social network for professionals to connect, share and learn. It's like Facebook. Despite being one of the most popular social platforms today, many people still have no idea what

LinkedIn is supposed to be used for or how they might benefit from being on it. Whether you're a marketing executive at a major company, a business owner who runs a small local shop or even a first-year college student looking for their first job after graduating, LinkedIn is for anybody and everybody who's interested in taking their professional life more seriously by looking for new opportunities to grow their careers and to connect with other professionals. LinkedIn is one big virtual networking event that emphasizes a user's professional connections. Users create profile pages that have a structure similar to a résumé, in that users can summarize their career, advertise their particular skills, and list their education and employment history. Connections are formed between users when one accepts an invitation from another to join his or her network. LinkedIn allows users to further their careers by searching for jobs, finding connections (even at third hand) at a particular company, and receiving recommendations from other users. Membership is free; however, with payment for premium service, users can receive more profiles in their search results and see full profiles of any LinkedIn user. On LinkedIn, you network with people by adding them as 'connections,' similar to how you'd make a friend request on Facebook. You converse via private message (or available contact information), and you have all of your professional experience and achievements laid out in a neatly organized profile to show off to other users.

The basic features of LinkedIn are: news feed, showing recent posts from your connections with other professionals; profile shows your name, your photo, your location, your occupation and more right at the top. Below that, you have the ability to customize various different sections like a short summary, work experience, education and other sections similarly to how you might create a traditional resume or CV; a list of all the professionals you're currently connected with on LinkedIn. If you hover your mouse over this option in the top menu, you'll also be able to see a number of other options that will allow you to add contacts, find people you may know and find alumni. All sorts of jobs listings are posted on LinkedIn everyday by employers, and LinkedIn will recommend specific jobs to you based on your current information, including your location and optional job preferences that you can fill out to get better-tailored job listings. You can also follow certain interests on LinkedIn like company pages, groups according to location or interest, LinkedIn's SlideShare platform for slideshow publishing and LinkedIn's Lynda platform for educational purposes. LinkedIn has a powerful search feature that allows you to filter your results down according to several different customizable fields. Click "Advanced" beside the search bar to find specific professionals, companies, jobs and more. When you want to start a conversation with another professional, you can do so by sending them a private message through LinkedIn. You can also add

attachments, include photos and more. LinkedIn has a notification feature that lets you know when you've been endorsed by someone, invited to join something or welcomed to check out a post you might be interested in. When other professionals invite you to connect with them on LinkedIn, you'll receive an invitation that you'll have to approve. A sample page of LinkedIn is shown below in Figure 2.

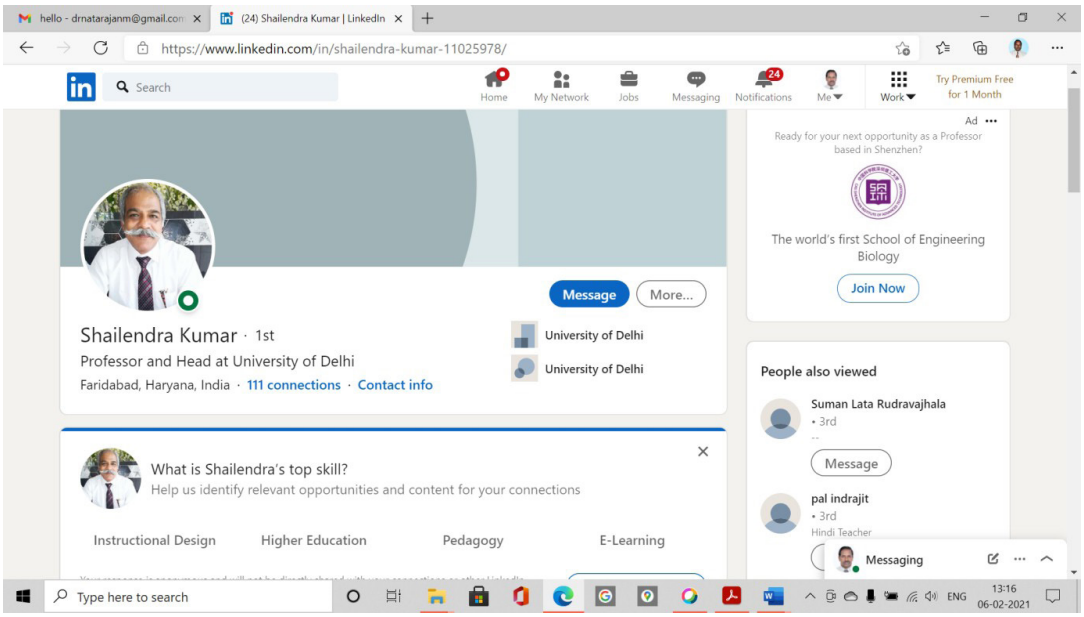


Figure 2: Sample page of LinkedIn

There is a LinkedIn's Business Services and/or Premium account upgrades, which allow users to post jobs, take advantage of talent solutions, advertise on the platform and expand your sales strategy to include social sales on LinkedIn.

Mendeley (www.mendeley.com)

Mendeley.com is a free reference tool, acts as a web service combining the features of ASNs that helps academicians to organize their paper, cooperate with others virtually, and discover the latest research around the world (MacMillan, 2012). It is a tool to manage, organise, share and discover research related activities. Mendeley helps users to create an academic profile, upload and share files that encourages collaboration with other groups by sharing papers, following updates, making comments and tracking progress within the groups. Another function in Mendeley is users are allowed to search and upload papers to their profile's library and directly leave a comment on their col-leagues' papers. Mendeley is not only free to sign up, but users are able to download it to the personal desktop.

The users can read annotate and highlight papers in pdf format. Mendeley automatically organises and sorts your papers in PDFs. It also offers comprehensive search and intuitive navigation where you can navigate your research library through relevant fields like author, title, publisher, discipline and journal (Sample page Figure 3). Mendeley is a flexible platform where you can import papers from anywhere, be it from websites (via web importer), existing software (BibTeX, RIS and EndNote™ XML files), drag and drop from desktop, or use feature like "Watch" where you can choose a folder on your computer to 'Watch'. When you next add papers to that folder, they are also automatically added to your Mendeley library (Mendeley, 2014). Researchers can also collaborate and communicate via projects, discussions, team plans and groups. They can track progress of their projects, review articles in real time with their fellow colleagues. Mendeley also provides 2GB of free online storage to automatically back up and synchronise your library across desktop, web and mobile. Multiple access points like computers which have installed pre-installed Mendeley, Internet web through any browser, any operating system or via iPhone or iPad are compatible. You can search millions of papers, refine your search to full-text PDFs and add papers to your library in one click. You can also find ongoing research, follow curated bibliographies and get involved in discussions in public groups. Mendeley has a quick and simple installation, citation styles for thousands of journals, instant bibliographies creation, flexible formatting, collaboration on bibliographies features associated (Mendeley, 2014).

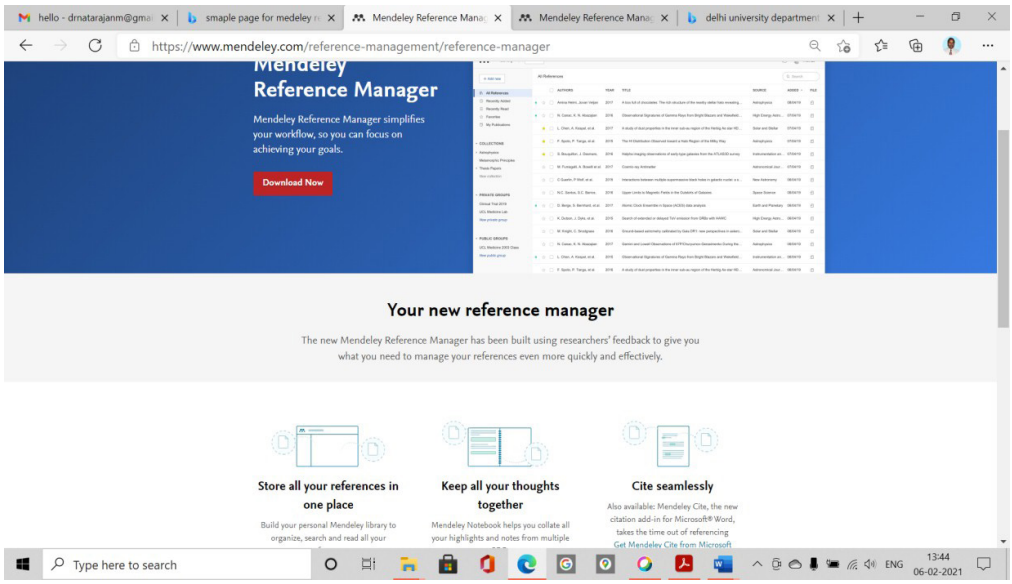


Figure 3: Sample page of Mendeley

ResearchGate (www.researchgate.net)

ResearchGate established in 2008 in Berlin by Ijad Madisch, Horst Fickenscher, and Sören Hofmayer. The mission is to connect researchers and make it easy for them to share and access scientific output, knowledge and expertise. Additionally, its purpose is to connect geographically distant researchers and allow them to communicate continuously on the basis of the open-world concept and the elimination of distance as an important factor in working relations. A secondary goal is to create access to studies even before they are completed for purposes of peer review and exchange of ideas (Ovadia, 2014). It also provides research scholars with services that include connection and collaboration with research scholars, experts, peers and others involved in network activity, share and access scientific output, knowledge, and expertise, share publications, access others and publish data, get stats about views, downloads and citations of their researches. It is also used as a tool to ask and reply to questions, find solutions to research problems, finding impact points and RD score, to request for full text articles, bookmarking articles. One can also remain updated about recent activities by getting live feeds (ResearchGate, 2014).

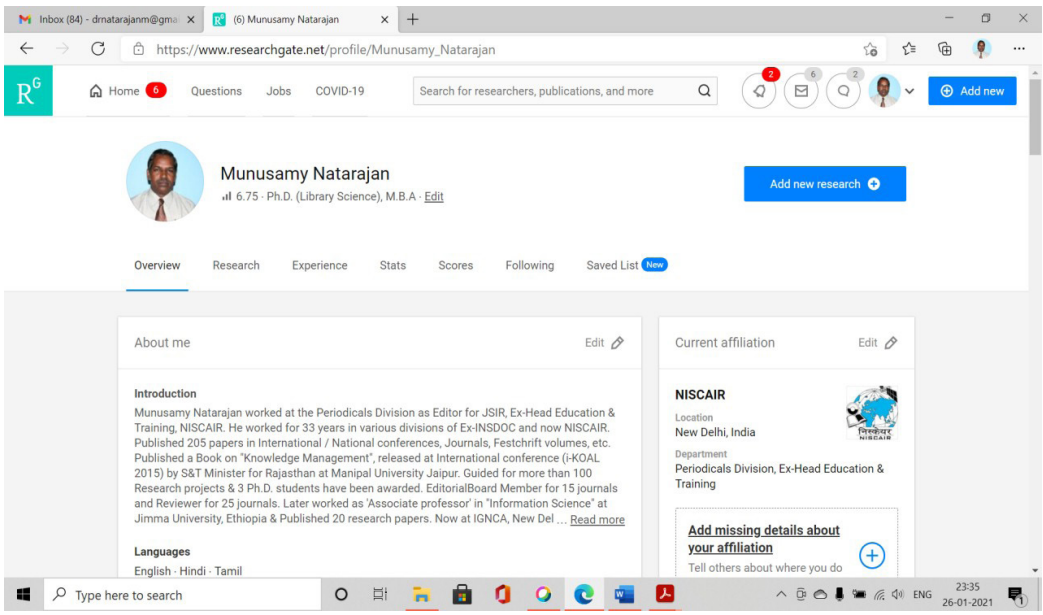


Figure 4: Sample of ResearchGate page

One can also follow and discuss different topics, start a new project, or create and open reviews. It also acts as a communication tool via messages. ResearchGate (RG) can also be used to showcase profile, export profile as CV and find the right

job. It also provides browsing feature where one can search publications through keyword search, similar abstract or Journal finder, and can get access to them if you are a member (Figure 4). Through RG, researchers can:

- Ask questions and respond to all users regarding their subject matter.
- Obtain notifications whenever new work is uploaded.
- Directly message to request feedback through RG's messaging system.
- Request to share full versions of articles.
- Allows generation of project logs on their current projects.
- Request to submit papers as special issues in journal body.

In general, Academia.edu and ResearchGate sites, users create profiles, identify collaborators, highlight articles and develop productive research collaborations. They focus more on the producers of research. Both use a 'following model', where users can follow the activity of other users, seeing things like papers added, questions answered and asked, and, in the case of ResearchGate, endorsements from other users. A peculiar function is the ability to crowd-source: individuals post problems or queries on an open forum, relying on the expertise of the community to provide answers and promote an exchange of ideas. While reference management sites (Zotero, Mendeley, etc) focus on readers, helping users to find, collect and share relevant references for their work. However, Mendeley is the only site that provides advanced group collaboration tools like, a shared library and collaborative document processing. Academia.edu, Mendeley and ResearchGate are more scholarly focused. LinkedIn, Academia.edu and ResearchGate pair users with job announcements. Moreover, ResearchGate and LinkedIn show researcher's skills, which can be endorsed by other users.

5. Scientific Collaboration Among Researchers

ASNs have the potential of revolutionizing the patterns of information publication and sharing in the academic world. By offering platforms for interrelations among scholars around the world, they may influence the structure and dynamic of the research community. Official academic publishing is based on acceptance of articles by refereed academic journals - either in print or in online academic databases that are accessible mainly to those who are active in an academic establishment - for which a fee is usually charged. However, ASNs do so easily and at no charge. They encourage authors to upload full-text articles that appeared in academic journals, lectures presented at conferences, and even drafts, and make them accessible to

the public (Wilkinson, Harries, Thelwall, & Price, 2003). They also allow readers to respond to an article or ask the author about it (Thelwall & Kousha, 2014), thereby encouraging interaction between readers and researchers.

Some of the tools provided by ASNs are: discussion boards, file repository, email, instant messaging, citation count, almetrics, public /private profile, group collaboration, reference management, collaborative document processing, network visibility, upload publications and linking of information to social media sites. The tools are shown below in Table 1:

Name of ASN	Popularity	Collaboration	Online personal management	Research Dissemination	Document Management	Impact Measurement
Academia	*	*	*	*	---	*
LinkedIn	*	---	*	*	---	---
Mendeley	*	*	*	*	*	---
Research Gate	*	*	*	*	---	*

**available*

Collaboration: As an example, let us create a profile on ResearchGate and then add publications. It makes it easy to add publications as well as unpublished work to your profile. To add your research such as journal articles, conference papers, and other publications such as books, chapters, and technical reports, go to your profile and select the type of publication from the drop-down list by clicking in the blue box in the top right-hand corner. Once you've added your publications and research to your profile, they'll be listed under your Contributions tab. You can see an overview of your stats in one simple, interactive graphic. You'll find more information on how often your work has been downloaded and cited, and if the researcher permits it, by whom. This offers a unique opportunity to connect with peers who are interested in your research. You will also get more information on which country and institution interested researchers come from, as well as which of your publications are downloaded most each week.

Also, one can ask research-related questions and get them answered by other specialists. It's also the best place for you to share your knowledge, connect with researchers, and identify yourself as an expert in your field. ResearchGate's Q&A recommendations take your unique set of skills and expertise into account to present you with the most relevant discussions in your field –you can find these

questions under "*Questions we think you can answer"* on the right-hand side of your Q&A overview page. Make sure you keep your research skills and expertise up to date to get the best recommendations find other researchers and their publications, then able to find out the scores and have statistics. You can also browse questions and answers using the other three filters: *Recent questions in your field, Questions you follow* and *Questions you asked*. You can search for topics using the search bar on the right-hand side (pictured below), which will show questions which were tagged with that topic. You can also search ResearchGate to find more questions.

Similarly, Academia.edu plays a role in formal scholarly communication because authors can upload preprints and other documents to their profile. One can view an extraordinary amount of information about how students, researchers, and academics view your profile and your papers by reviewing your ***Academia*** analytics. You can view the analytics associated with your account for the past 30 days or the past 60 days. You can also export your data as a CSV.

- The top of your analytics page will display an overview of users who have viewed your profile and papers.
- Paper views indicate the amount of time all of your papers have been viewed.
- Unique visitors are how many individual people have visited your papers OR your profile.

Site navigation - Site navigation is an important feature in ASNs. Some of the features are: i) User can give feedback to other users' contents ii) Direct link of home page is provided on each page of website iii) Recommend the Friend to follow iv) Filter malicious information v) While navigating each time user know the current location vi) Users can provide suggestions vii) Users can give feedback about the site viii) Provision of chat with other users ix) Profile information is in detailed to identify the credential of person x) User cannot hide any information of the profile such as, Gender, age, institution and designation xi) Profile page is linked with each post xii) Users can search for users having similar interests in the group xiii) Related contents can be grouped xiv) Friend's network can be explored

All navigation features are not available with all of ASNs. All the four sites have a feature to explore friend's network and tracking of friend's conversation. It was revealed that no site has the feature to give rating to the contents or link of friends' profile. In addition, users of these sites cannot provide suggestions or chat with other users. No site suggests papers related to user's interest. None of the sites

supports multilingual use. Only Academia.edu users can hide profile information such as, gender, age, institution and designation.

6. Challenges to the Academicians / Researchers

Nowadays, the explosion of data in terms of value, volume, veracity, velocity, and variety, or known as 5V, powered by exciting and magnificent advances in web techniques and information technologies have become the centre of general attention. The researchers have to face a number of difficulties in relation to ASNs for getting the i) collection of relevant data, ii) data quality which require the difficulty of computation in analysing ASNs iii) determining metric for effective evaluation of ASNs and to develop efficient algorithms, as extensive investigation on the analysis and modelling of ASN, a few methods and technologies are being utilized in this domain, such as data mining, machine learning, neural networks and parallel processing. These methods and technologies are given a wide scope as a way to study ASN.

7. Conclusion

In this article, a study of academic social network sites for four ASNs were discussed with their functions. It also discusses the opportunities for ASNs, and provides the challenges for ASNs in social networking. This discussion should be considered as a guide for academicians or researchers to create, use and analyse the current increasing data from various ASNs and provide motivation for further research on social network analysis, and also new opportunities in the area of new emerging technologies. The utility of these social networks will depend upon the individual. Similarly, the time commitment will also vary. In addition, ASNs do not have all the search and browsing fields. Majority of sites do not have mobile view. Besides, these sites do not have the provision of contributing all types of contents. Anyone even remotely curious about these ASNs would be advised to create a simple account in one or both and spend some time seeing whether there's any benefit. Some users might find it a helpful way to keep abreast of the literature, while others might find it a helpful way to keep tabs on former and current colleagues. Some users might find the publication metrics helpful and some users might realize that these networks are not the best use of their time. The convenient thing about online communities is that if one is not a good fit, there is almost always a new one in the pipeline. Future research could explore the comprehensive investigation of

the architecture of ASNs based on mining social network. LIS professionals should include in the library instruction regarding the ASNs and find out the usefulness and many studies can be done regarding further.

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NAAC Criteria 3 and the Attitude of the Academicians Towards Plagiarism Compliance

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Abstract: As per the NAAC criteria 3, the weightage has been given on research activities. All academicians are aware about the NAAC. For the fulfilments of the criteria 3, research activities should be increased in the institutions. As far as the quality research is concern, the research publications should be safe from plagiarism as per the UGC guidelines. In this article, PhD./M.Phil. degree holder academicians and Master's degree holder academicians are considered for the study. Online survey has been conducted through Google forms. The opinions of the academicians regarding attitude towards plagiarism compliance have been studied. The survey has been conducted in the engineering colleges affiliated to the University of Mumbai. Focus was given to the Ph.D./M.Phil. degree holder & Master's degree holder academicians working in engineering colleges. The collected data have been analyzed with SPSS software and tested with T-test. It is found that, all academicians are aware about plagiarism. There is no significant difference of attitude among these two groups. However, Ph.D./M.Phil. degree holder academicians have more knowledge about the plagiarism than Master's degree holders. Almost all academicians are well aware about the NAAC requirements. The analyzed data have been shown with the help of charts and graphs.

Keywords: Academicians, NAAC, Plagiarism, Engineering colleges, University of Mumbai.

1. Introduction

The National Assessment and Accreditation Council (NAAC) conducts assessment and accreditation of Higher Educational Institutions (HEI) such as colleges, universities or other recognised institutions to derive an understanding of the 'Quality Status' of the institution. NAAC evaluates the institutions for its conformance to the standards of quality in terms of its performance related to the educational processes and outcomes, curriculum coverage, teaching-learning processes, faculty, research, infrastructure, learning resources, organisation,

governance, financial wellbeing and student services.

NAAC has categorised the Higher Educational Institutions into three major types namely University, Autonomous College, and Affiliated/Constituent College and assigned different weightages to these criteria under different key aspects based on the functioning and organisational focus of the higher educational institutions.

Academicians in all higher education institutions in India are well aware about the NAAC criteria and the requirements of the criteria's. All institutions are trying to fulfill the requirements of NAAC for getting good marks in terms of accreditation. A NAAC criteria three is concern with the research activities of the institutions. All the key aspects of research are covered by the NAAC under this criteria. In view of the NAAC criteria, all academicians should be aware about the academic ethics followed by the prevention and control of the plagiarism in research activities to fulfill the requirement of the NAAC criteria.

Table 1: NAAC- Distribution of weightages across Key Indicators (KIs)

Criteria	Key Indicators (KIs)	Universities	Autonomous Colleges	Affiliated/ Constituent Colleges	
				UG	PG
3.1	Promotion of Research and Facilities	20	20	NA	NA
3.2	Resource Mobilization for Research	20	10	15	15
3.3	Innovation Ecosystem	30	10	NA	10
3.4	Research Publications and Awards	100	30	15	25
3.5	Consultancy	20	10	NA	NA
3.6	Extension Activities	40	50	60	50
3.7	Collaboration	20	20	20	20
TOTAL		250	150	110	120

2. Plagiarism

Plagiarism is an act of theft a content of others and uses it as own. Some definitions of plagiarism are as under:

"The Merriam Webster dictionary defines the act of plagiarism as - to steal and pass off ideas or words of another as one's own".

Oxford University: "Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgement".

Nowadays, there is massive information is available online through internet on any subject. Since this material is easily available, there has become a tendency in students to copy the material from internet and paste it in the academic project and presents it as their own without acknowledgement of the original author. If any scholar cheat through plagiarism it means they have lost the chance to uplift their knowledge in a specific subject area. Due to the regular practice of copy-paste material among students, the plagiarism checking has become more important in all research activities in higher educational institutions. In developed countries, many scholars have faced to serious consequences after the plagiarism rules are introduced by laws. Their academic future and sometimes work career also has been spoiled due to the strict provisions made in the regulations of plagiarism in higher educational institutions.

There are many examples in world history about the literature theft and many authors have faced to serious legal consequences. Some academic ethics should have follow in the academic career by the research scholar. Plagiarism is a disciplinary offence as per the regulations, though the plagiarism happened intentionally or unintentionally. Hence, there should be some rules in higher educational institutions regarding the prevention of plagiarism in respect of the promotion of academic integrity. Many universities and colleges in developed countries have addressed the rules regarding plagiarism.

3. Indian Scenario: Overview

Academicians in all higher education institutions in India are well aware about the NAAC criteria and the requirements of the criteria's. All institutions are trying to fulfill the requirements of NAAC for gating good marks in terms of accreditation. NAAC criteria three is concern with the research activities of the institutions. All the key aspects of research are covered by the NAAC under this criteria. Considering this criteria, all academicians should be aware about the academic ethics followed by the prevention and control of the plagiarism in research activities. Therefore, to study the academician's attitude towards plagiarism compliance, the present survey has been conducted.

There were no rules and regulations in India at central level to prevent plagiarism in education field till July 2018. Also, there were no provisions of software's to check the plagiarism by rules. Therefore, there was no control on such unethical activities. But the situation is changing slowly in India for the quality research.

After the publication of UGC Regulations, 2018 in India regarding "Promotion of academic integrity and prevention of plagiarism in higher education institutions", many higher education institutions have become very much alert on this issue. Many Indian Universities have introduced the topic of Research and Publication Ethics in the syllabus of their PHD coursework for the good quality research. Many educational institutions have addressed the research and publication ethics at their institutions since the secondary school level. However, on the other hand there are many research scholars as well as academicians are not fully aware about these changes took place in higher education field in India.

Present Study

Considering the NAAC requirements and the seriousness of the plagiarism issues in academic activities, the survey has been conducted to study the attitude of the academicians towards the plagiarism compliance. The academicians having M.Phil./PhD. degree and Master's degree, working in engineering colleges affiliated to the University of Mumbai are focused in a present study. Comparative study of has been done. The engineering colleges under University of Mumbai are scattered in 6 districts of Maharashtra which covers urban as well as rural area. There are six districts comes under the University of Mumbai namely 1) Mumbai, 2) Thane, 3) Palghar, 4) Raigad, 5) Ratnagiri and 6) Sindhudurg. Out of these six districts, 1) Mumbai and 2) Thane are considered as urban district and remaining four are considered as rural districts.

The online survey has been conducted for the study. The questionnaire has been prepared on Google form and sent through the emails of the academicians, to find out the awareness of the plagiarism among academicians in Engineering institutes affiliated to the University of Mumbai. Total 67 engineering institutions are there affiliated to the University of Mumbai. Total 500 academicians from 67 colleges have been selected with random sampling technique. 500 Google forms have been mailed to the randomly selected faculty members Out of 500 academicians 439 have been responded to the questionnaires.

Study the attitude of the Academicians

Two groups of the academicians have been focused in this survey namely –

1. PhD./M.Phil. degree holder academicians and
2. Master's degree holder academicians.

Table 1: District wise responses received from the academicians

Education of the Academicians	Count	Mumbai	Thane	Palghar	Raigad	Ratnagiri	Sindhudurg	Total
Ph.D./M.Phil.	Total Count	29	42	9	13	6	2	101
	Total %	29.3%	31.8%	18.8%	11.4%	18.2%	15.4%	23.0%
Master's Degree	Total Count	70	90	39	101	27	11	338
	Total %	70.7%	68.2%	81.2%	88.6%	81.8%	84.6%	77.0%
Total	Total Count	99	132	48	114	33	13	439
	Total %	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

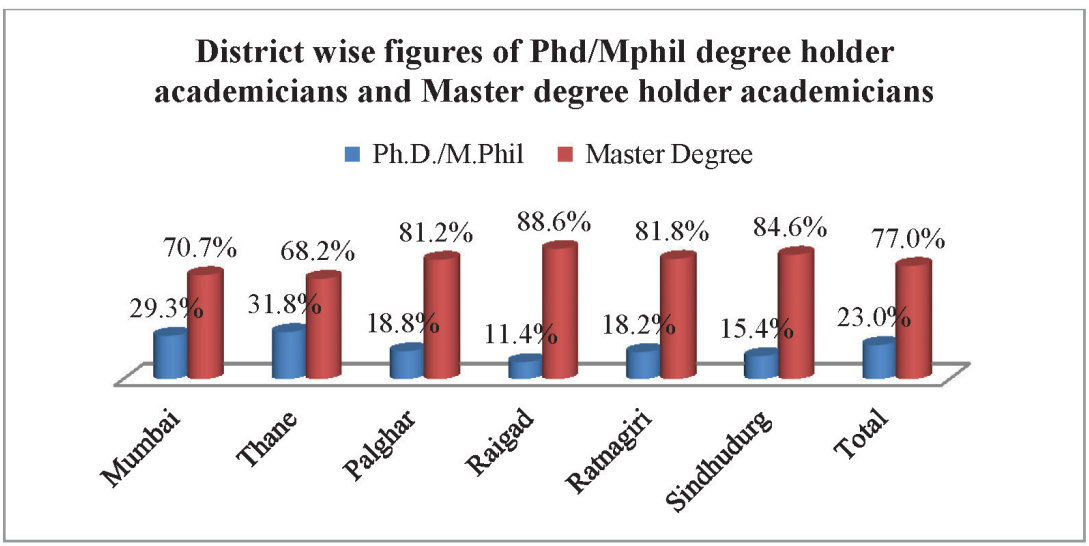


Figure 1: No one will check and detect copied material

From the above table it is inferred that, out of 439 academicians, maximum 31.8% Phd./M.Phil. degree holder academicians have responded from Thane district and 88.6% Master's degree holder academicians have responded from Raigad district which is maximum in numbers. Whereas, 68.2% Master's degree holder academicians from Thane district & 11.4% PhD. degree holder academicians have responded to the questionnaire which is lowest in numbers.

The study has been carried out with the intension to find out the attitude of the M.Phil./PhD. degree holder academicians and Master's degree holder academicians towards plagiarism compliance. To identify their views, following questions related to the attitude were asked to the academicians.

1. No one will check and detect copied material
2. Fear of failing to comply with the requirements of publications during research
3. Many research scholars copy others work hence me too
4. Plagiarism is justified due to burden of academic activities
5. No other option but to plagiarized because of deadlines and work pressures
6. We can copy paste our own article in our other article
7. Without copying others work nobody can write research article
8. Easy availability of content on web leads to plagiarism
9. Copy-pasting sentences from Internet is easier than creating one's own
10. Poor understanding of research topic compels to plagiarize

The questionnaire received from the Google form have been exported in excel sheet and analysis has been done with SPSS statistical software. The data has been tested with the 't' test to find out the 'p' values of the collected data. The analyzed data has been examined with 't' test is as below -

Data examination with T-Test

Here, the mean value of the collected data has been found. Also, only the "assumed" equal variances are considered while analysis of the data and the calculations of mean value, t-value and 'p' value.

Table 2: Attitude Towards Plagiarism

Attitude Towards Plagiarism	Education	N	Mean	Std. Deviation	t-value	df	Sig. (2-tailed)
No one will check and detect copied material	Ph.D./M.Phil	101	2.58	1.321	.324	437	.746
	Master Degree	338	2.54	1.328			
Fear of failing to comply with the requirements of publications during research	Ph.D./M.Phil	101	2.99	1.300	.659	437	.510
	Master Degree	338	2.90	1.239			
Many research scholars copy others work hence me too	Ph.D./M.Phil	101	2.26	1.293	.386	437	.699
	Master Degree	338	2.20	1.280			
Plagiarism is justified due to burden of academic activities	Ph.D./M.Phil	101	2.27	1.370	.178	437	.859
	Master Degree	338	2.30	1.429			
No other option but to plagiarise because of deadlines and work pressures	Ph.D./M.Phil	101	2.33	1.464	.008	437	.993
	Master Degree	338	2.33	1.314			
We can copy paste our own article in our other article	Ph.D./M.Phil	101	2.92	1.474	.669	437	.504
	Master Degree	338	2.82	1.344			
Without copying others work nobody can write research article	Ph.D./M.Phil	101	2.26	1.270	.705	437	.481
	Master Degree	338	2.16	1.158			
Easy availability of content on web leads to plagiarism	Ph.D./M.Phil.	101	2.90	1.425	1.386	437	.166
	Master Degree	338	3.11	1.271			

Copy-pasting sentences from Internet is easier than creating ones own	Ph.D./M.Phil.	101	2.58	1.259	1.689	437	.092
	Master Degree	338	2.83	1.280			
Poor understanding of research topic compels to plagiarize	Ph.D./M.Phil.	101	3.30	1.425	3.138	437	.002
	Master Degree	338	3.72	1.093			
Attitude towards Plagiarism- Total Score	Ph.D./M.Phil.	101	26.39	9.761	.503	437	.615
	Master Degree	338	26.88	8.403			

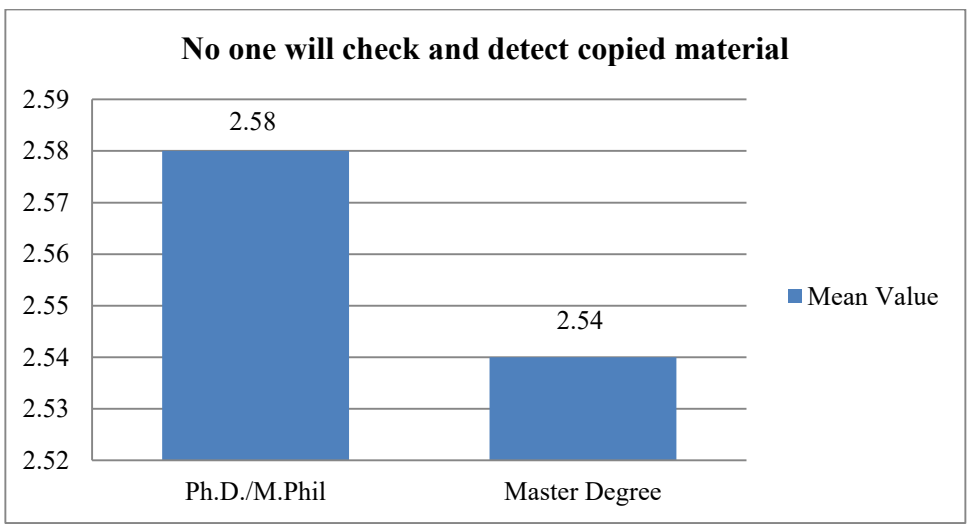


Figure 2: No one will check and detect copied material

Out of 439 total academicians, 101 are with M.Phil./PhD. degree and 338 are with Master's degree holder. The mean value for the responses received from the academicians with M.Phil./PhD. degree and Master's degree holders is found 2.58 & 2.54 respectively. The 't' value is observed as .324 with degree of freedom 437 and 'p' value is .746. Hence, it is inferred that, there is no significant difference of opinion among M.Phil./PhD. degree holder and Master's degree holder academicians when asked about the attitude towards plagiarism with the statement 'No one will check and detect copied material'.

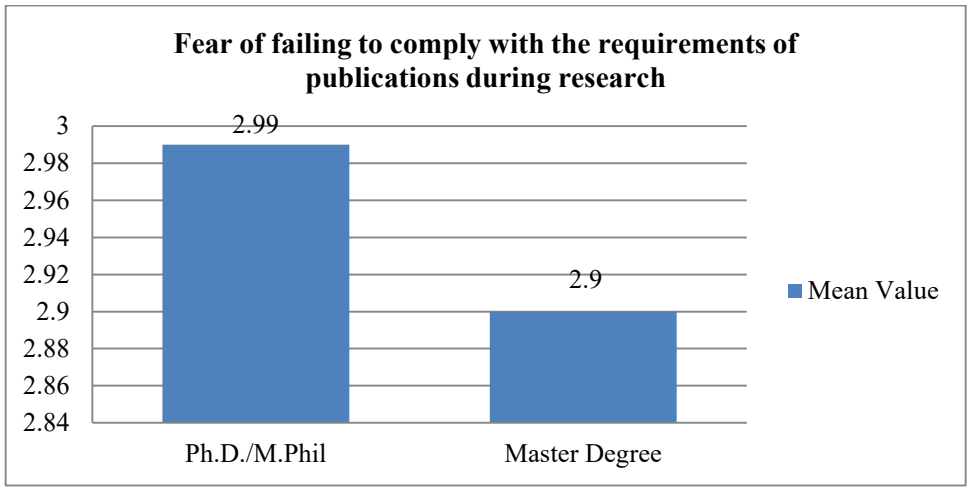


Figure 3: Fear of failing to comply with the requirements of publications during research

As per the responses received from the academicians for the statement above, it is observed that the mean values of the academicians with M.Phil./PhD. degree and Master's degree are 2.99 and 2.9 respectively. The t-value is .659 with 437 degree of freedom and the 'p' value is .510 which is not significant. Hence, we can say that, there is a no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism compliance.

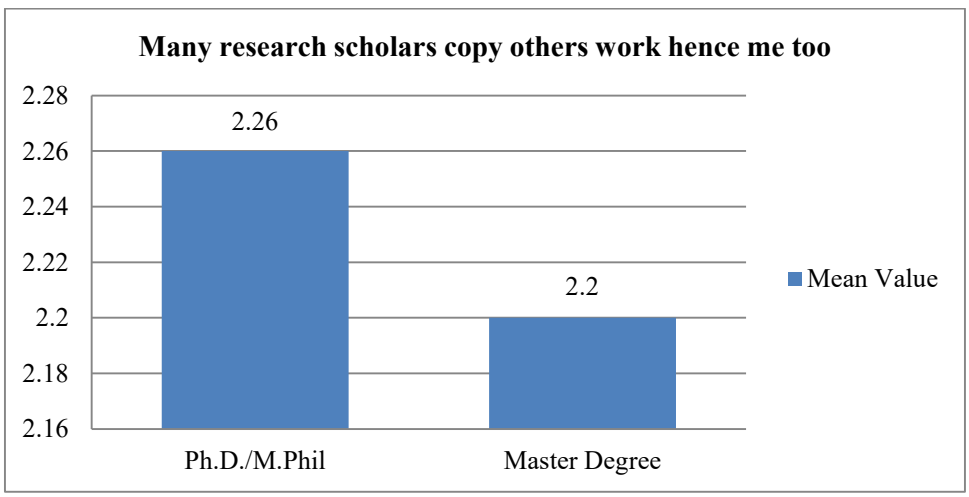


Figure 4: Many research scholars copy others work hence me too

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 2.26 and 2.2 respectively. The t-value is .386 with 437 degree of freedom. The 'p' value received is .699 which is not significant. Hence, we can say that, there is no significant difference of the opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

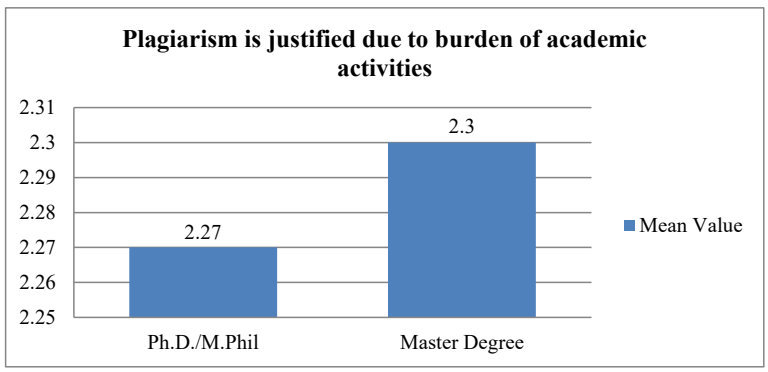


Figure 5: Plagiarism is justified due to the burden of academic activities

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 2.27 and 2.3 respectively. The t-value is .178 with 437 degree of freedom. The 'p' value received is .859 which is not significant. Hence, we can say that, there is no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

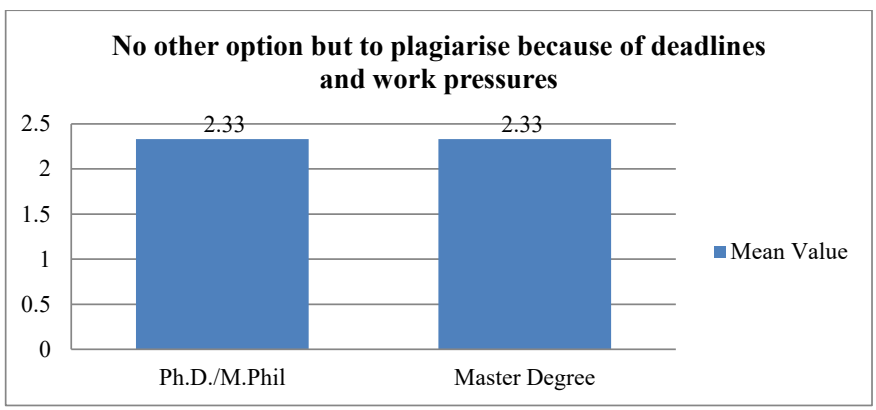


Figure 6: No other option but to Plagiarized because of deadlines and work pressure

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 2.33 and 2.33 respectively. The t-value is .008 with 437 degree of freedom. The 'p' value received is .993 which is also not significant. Hence, we can say that, there is no difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

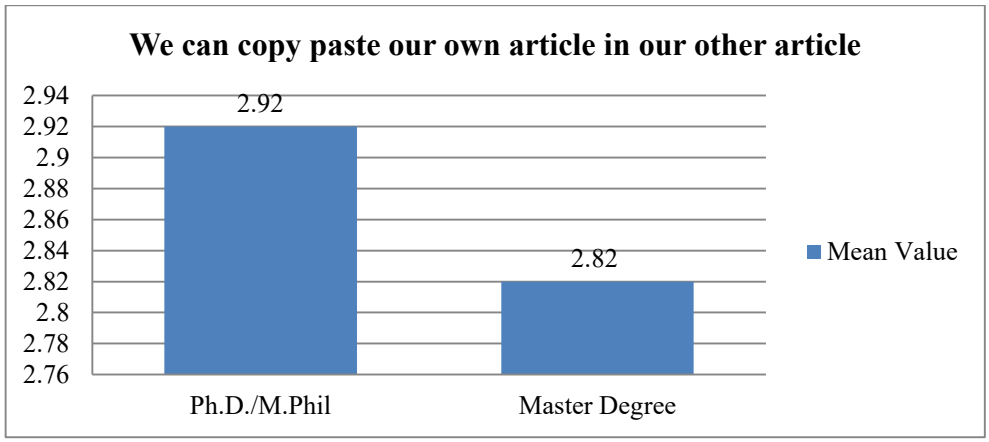


Figure 7: We can copy paste our own article in our other article

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 2.92 and 2.82 respectively. The t-value is .669 with 437 degree of freedom. The 'p' value received is .504 which is not significant. Hence, we can say that, there is no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

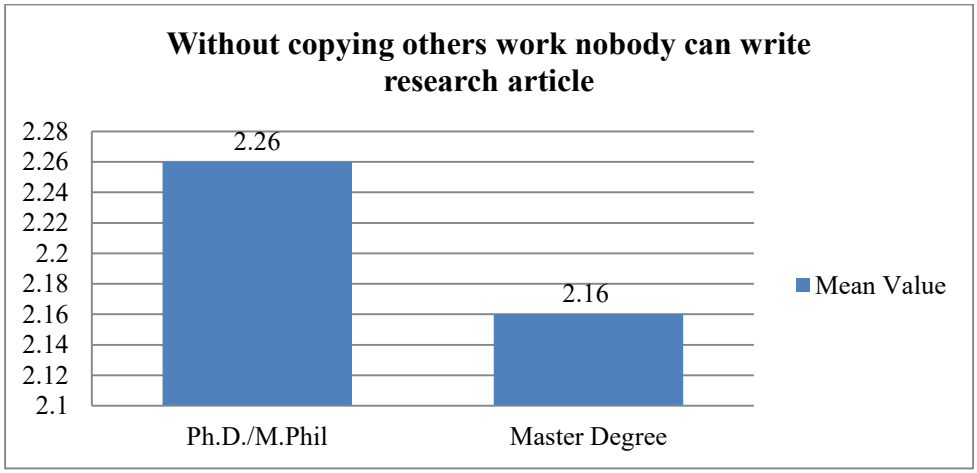


Figure 8: Without copying others work, nobody can write research article

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 2.26 and 2.16 respectively. The t-value is .705 with 437 degree of freedom. The 'p' value received is .481 which is not significant. Hence, we can say that, there is no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

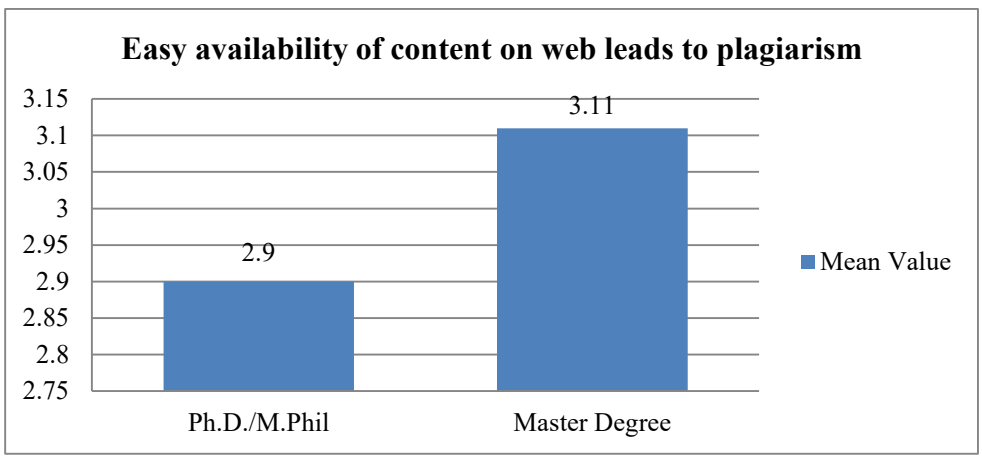


Figure 9: Easy availability of content on web leads to plagiarism

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree

holder and Master's degree holder academicians are 2.9 and 3.11 respectively. The t-value is 1.386 with 437 degree of freedom. The 'p' value received is .166 which is not significant. Hence, we can say that, there is no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

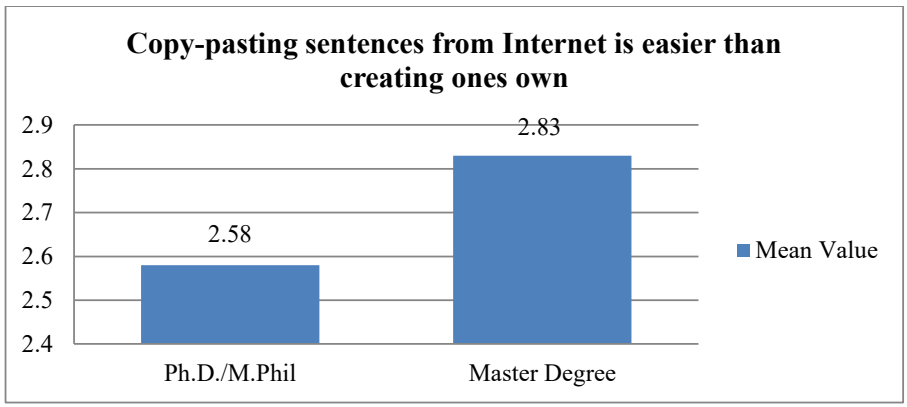


Figure 10: Copy-pasting sentences from internet is easier than creating ones own

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 2.58 and 2.83 respectively. The t-value is 1.689 with 437 degree of freedom. The 'p' value received is .092 which is not significant. Hence, we can say that, there is no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

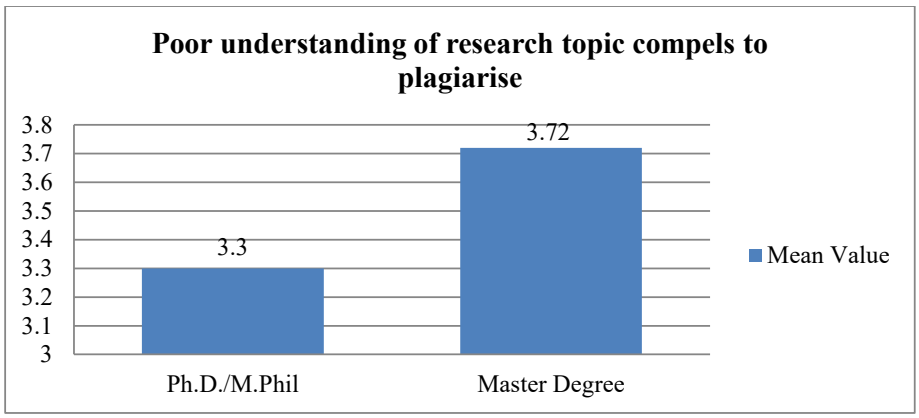


Figure 11: Poor understanding of research topic compels to plagiarism

As per the responses received from the academicians for the statement above, it is observed that the mean values of the responses received from M.Phil./PhD. degree holder and Master's degree holder academicians are 3.30 and 3.72 respectively. The t-value is 3.138 with 437 degree of freedom. The 'p' value received is .002 which is significant. Hence, we can say that, there is a significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of the above statement regarding the attitude towards plagiarism.

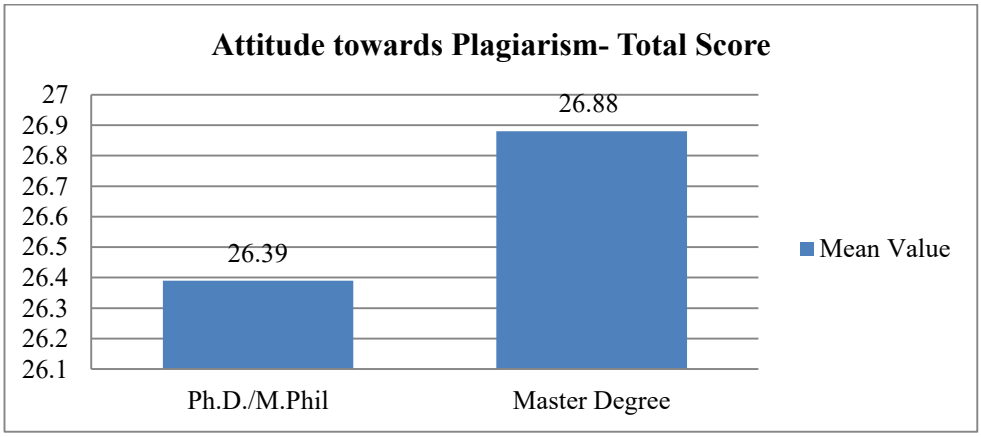


Figure 12: Attitude Towards Plagiarism – Total Score

As per the responses received from the M.Phil./PhD. degree holder and Master's degree holder academicians for the average of the above all statements, it is observed that the mean values are 26.39 and 26.88 respectively. The t-value is .503 with 437 degree of freedom. The 'p' value received is .615 which is not significant. Hence, we can say that, at an average, there is no significant difference of opinion among the M.Phil./PhD. degree holder and Master's degree holder academicians in respect of all the above statements regarding the attitude towards plagiarism.

Conclusion

- The plagiarism awareness of the academicians is clear; At least 50% at an average academician are well aware about the plagiarism in general.
- The attitude of the PhD./M.Phil. degree holder and Master's degree holder academicians towards the compliance of plagiarism have found same in respect of the one statement "No other option but to Plagiarized because of deadlines and work pressure".

- There is highly significant difference of attitude among the PhD./M.Phil. degree holder and Master's degree holder academicians in respect of the statement "Poor understanding of research topic compels to plagiarism".
- At an average, there is no significant difference in the attitude of PhD./M. Phil. degree holder and Master's degree holder academicians towards plagiarism compliance.
- Maximum PhD./M.Phil. degree holder and Master's degree holder academicians are taking initiatives to promote the virtual education.
- Academicians with PhD./M.Phil. degree holder are more alert about the issues of plagiarism than Master's degree holder academicians.
- There are some academicians taking plagiarism issues very lightly.
- Attitude of the PhD./M.Phil. degree holder academicians towards plagiarism compliance is very positive, maximum PhD./M.Phil. degree holder academicians supports the academics ethics and values.
- All higher educational institutions have to undertake the activities mentioned as per the NAAC criteria 3 for the complete growth of the students.

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Scientific Publication, Ethics and the Menace of Plagiarism

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Abstract: Research publications are the end-products of any scientific/research activity in academia and research organisations. 'Scientific plagiarism', 'copyright infringement', and other unethical practices associated with research publications are global phenomena. The quality and quantity of these-end products are considered as a measure of scientific output. Plagiarism is an issue that is more concerned with the ethical conduct of an individual author(s). The paper discusses various forms of plagiarism with a comparison with copyright infringement & it's likely consequences. It also discusses the strategies and approaches that the authors can adopt while writing their research papers, thesis, etc., to avoid plagiarism. While submitting its recommendations, the paper also highlights the role 'Information Scientists / Library Professionals' can play in controlling the menace of plagiarism.

Keywords: Plagiarism, professional ethics, scientific publications, plagiarism detection software/ tools, scientific output.

1. Introduction

Rapid advancement in the field of information technology has necessitated a transformation in the field of library & information science. It has grown as an interdisciplinary field. Growth has also been witnessed in the type, processes and dissemination of information being handled by library professionals' world over. The perception and information-seeking behaviour of end-users has also changed over the years. In such a dynamic environment, library professionals are facing challenges to keep pace with these global changes. These challenges are both internal and external. The internal challenges are necessitated by the technological advancement and ever-increasing user requirements whereas external challenges are from fellow IT professionals, who seem ever ready to encroach upon the library profession.

Keeping pace with the emerging challenges, the libraries and library professionals are reshaping. Whereby newer and newer platforms and services are being explored and provided to the end-users. Controlling the menace of plagiarism and copyright infringement is one such avenue where Information / Library

Professionals can proactively help their Institutions and end-users.

In academia and research organisations, the quality and quantity of scientific publications are the main criteria for appointments and career growth of scientists and researchers. A research paper becomes a source of reference for others and the original author himself after having been published. Only the authors become responsible for their published papers. There have been incidences of unethical approaches in writing and publishing scientific literature which can be unintentional or intentional, leading to what is known as 'Plagiarism'.

2. Objectives

The objective of this paper is to:

a. Check the global scenario of scientific publications;
b. Analyse the guidelines of academic institutions and the research organisations to check and control plagiarism in their respective Institutions/Organisations; and
c. Analyse the role of Information Scientists/library professionals to check the menace of plagiarism.

3.0 About Plagiarism and Scientific Misconduct

The word "plagiarism" is derived from the Latin word "plagiare" and it means using someone else's work or ideas without giving them credit and claiming that it to be your own, whether intentional or unintentional. It is a theft of others' ideas or words without citing proper reference and thus without giving appropriate credit to the original author

Plagiarism is a form of research misconduct, where - "misconduct means fabrication, falsification, or any other practice that seriously deviates from practices commonly accepted in the discipline or the academic and research communities generally in proposing, performing, reviewing, or reporting research and creative activities."

The menace of plagiarism is a severe problem and a breach of academic standards. It destroys the reputation of institutions in general, and this concern has been expressed by many scholars and pointing that such wrongdoing in academics calls for a review of institutional procedures to improve practices and organisations' codes of conduct.

3.1 Plagiarism vs Copyright:

Plagiarism is an ethical issue, whereas copyright infringement is a legal issue. In plagiarism, the concerned author(s) and the readers citing that contents are affected, while in copyright infringement the copyright holder is affected. Copyright applies to licensed contents only, whereas plagiarism applies to both licensed and unlicensed materials. Plagiarism by researchers has sharply increased in recent years. There has been an on-going debate within organisations/ institutions—accordingly, it's a prolific research field which is marked by similar but distinct lines of investigation.

Other methods of fraud include duplication of microscopic images. In general, "simple duplications (same orientation and magnification) are the most common, and there might be simple errors which are caused by selecting the same image twice or thrice instead of picking the correct one. After that, overlapping images are ubiquitous as well. Manipulated images or Rotated (in which the same cells are visible multiple times) are less common but also harder to spot".

3.2 Scientific Misconduct

Scientific misconduct and unethical practices, if practiced by someone, affects both scientific knowledge and scientific community. The falsification & fabrications practices lead to distortion of scientific knowledge whereas plagiarism, submission of duplicate publications, abuse of peer-reviewing process, non-compliance of regulatory guidelines, and inappropriate authorship misleads the scientific community. As such, scientific misconduct can be categorised as under:

a. **"Embezzlement of ideas:** Claiming an idea to be one's own while it was obtained from privileged access while reviewing manuscripts, grant proposals, or through participation in lectures and personal discussions and earlier publications (but not citing them). It also includes acts wherein others' ideas are present as one's own through slight changes in words, phrases, and illustrations.
b. **Plagiarism:** Using other's words, results, or published work without appropriate citation. It includes using one's written work (self-plagiarism) without proper disclosure/citations.
c. **Falsification:** Misrepresentation or suppression/ addition of a part of data to generate cherry-picked results or improper reporting of results to present a misleading outcome.

d. **Fabrication:** Reporting 'results' of experiments that practically never done. It also includes images/ photographs being morph to reach a particular interpretation.

e. Fraud: Deliberate suppression of previous work in publications and inappropriately claim originality and avoid quoting previous publications contrary to present results.

f. Non-compliance of Regulatory Guidelines: It involves the deliberate violation of ethical guidelines accepted for human and animal research, non-adherence to bio-safety regulations, or inappropriate use of research funds.

g. Inappropriate Authorship: Excluding genuine contributors from authorship, including non-contributors, or claiming authorship for oneself without having made any meaningful contribution is inappropriate. In cases of publication of work carried out during a Ph.D. thesis, due care should be taken by the thesis Supervisor to ensure that the scientific contributions of a student are neither diluted nor exaggerated.

h. Withhold data from Validation: Not providing data or research material to the institute/journal for verification/validation purposes.

i. Wrong versus Fraudulent paper: It occasionally happens that a conclusion drawn in an earlier publication negated, modified, or shown where it went wrong- either by the same author or others. It is how science progresses. The first paper is thus not fraudulent".

3.3 Causes of Plagiarism

a. Poor writing skills.
b. Lack of referencing skills.
c. A casual attitude towards the seriousness of plagiarism.
d. Selection of predatory Publisher/ Journals.
e. Lack of proper understanding of research work.
f. Pressure from guides and scientists.
g. Cut and Paste culture.

h. Lack of time.

4. Scientific Publication - Global Scenario

As per the statistics compiled by the US National Science Foundation (NSF), the number of scientific papers published worldwide increased from 1,755,850 in 2008 to 2,555,959 in 2018. It further states that – "The global research output, as measured by peer-reviewed science and engineering (S&E) journal articles and conference papers, grew about four per cent annually over the last 10 years. In 2008, India published 48,998 science and engineering articles. This increased to 1,35,788 articles in 2018 at an average annual growth rate of 10.73 per cent and the country now accounts for 5.31 per cent of the total world publications in science and engineering. India is now the world's third-largest publisher of scientific articles with over 1.35 lakh scientific papers published. China is at the top followed by the USA at second position. Although a long way to go, as compared to the US and China in terms of the number of scientific article publications, India's emergence as the third-largest publisher is mainly due to a phenomenal double-digit growth rate in the last one decade from 2008 to 2018. The report noted Research papers from the US and the EU continue to have the most impact. China shows a rapid increase in producing impactful and qualitative publications that are measured by references to conference papers and journal articles. Specialisation in scientific fields differs among countries, with the US, Japan and the EU that are more specialised in health sciences and India & China are more specialised in engineering, as measured by journal articles and conference papers."

5. Predatory Publishers / Journals

The concern over predatory publishing is global. The term 'Predatory' was first coined by an American Librarian - Jeffery Beall in 2010 who published a list of 'predatory publishers' on his blog. 'Predatory publishers/ journals' often exist online only.

Predatory Journals or Publishers can be defined as "unscrupulous open access journals or publishers who publish articles on payment basis but with little or no real peer review. They exploit the business model of open access that involves charging publication fee without following the publication policies and services associated with legitimate journals." All open access journals are not necessarily predatory journals.

5.1 Indian Scenario

a. In the Indian system, when it comes to appointments or departmental assessment promotions, preference is given to the number of publications that a candidate has published. This creates pressure among the competing candidates to publish and present their research papers in the Conferences to earn the maximum marks to strengthen their claims. It does not always happen but often incentivises pay-to-publish practices.
b. The "perish or publish" model of academia has given rise to many predatory publishers who publish their research papers on payment basis, often without following any peer-review process.

As a result, India has become one of the biggest global hubs for pay-and-publish business, thus continuously giving a bad name. According to a report published in the daily newspaper 'Indian Express' in 2018, the major hubs of predatory publishing in India are: Hyderabad, Bareilly, Mandsaur (MP) and there may be many more. However, various Indian Academic and Research agencies have come up with their strict guidelines to check the menace of plagiarism within their organisations, recommending strict action against the researcher if there is a severe transgression level of misconduct.

6. Prevention of Plagiarism

There are no universally accepted regulations/guidelines for the prevention of plagiarism in scientific and academic institutions. However, the following guidelines are largely accepted:

a. The best way to avoid plagiarism is, to be honest with your research publications. One should not copy and paste from any source and must write his /her original ideas
b. If it is necessary to incorporate and use others' ideas in your work, always give credit and acknowledge the author of the original work you've used.
c. Authors must cite references and acknowledge ideas taken from others during formal/informal discussions.
d. References must contain full bibliographic information like - printed, electronic, data, images or recorded material used must be provided at the end.
e. Before submission, check your research work in the anti-plagiarism soft-

ware to avoid plagiarism. It's essential to focus on the tools to detect plagiarism, such as iThenticate, Turnitin, Urkund, etc. and the institutional policies to deal with the problem of plagiarism.

7. How to stop the Plagiarism of your Original/ Unpublished Work

a. Restricted Access: By providing access to anyone to your personal computer or access to your working platform that can lead to theft of your research work. That's why, when it comes to preventing plagiarism, the first step is restricting the access to your original, unpublished work;
b. Do not post your research work online unless it is published and don't share your research work outside of those you trust;
c. Protect your research work from the fake plagiarism checking tools. Don't upload your research work in any free plagiarism checker as it leads to theft of your original work;
d. It's always advisable to include a proper copyright notice with the research work. Though such notice is not legally required, it prevents any confusion about who owns the work and whether it is protected;
e. Another way is to provide guidance to others at the end of your research to cite your work properly;
f. Beyond this, researchers can track how their work is used online. This can be done easily using a federated search engine (i.e. WorldWideScience) by taking a passage from their writing and searching for it in quotes, and the number of hits shows the copies of their paper. And the researchers are then able to check whether others cite its work or not. If researchers wish to automate this process, they can use Google Alerts to send them an email when new instances of the phrase appear online.

8. Role Library Professionals can Play to Check the Menace of Plagiarism

The primary focus is on the information scientists/ librarian's role in avoiding plagiarism and exploring the connections between the various conceptualisations about what constitutes plagiarism, its manifestations, and related actions to deal with it. In this regard, Library professionals have a dual responsibility to:

a. Conduct training and awareness programmes for the Authors/Researchers;
b. Make authors aware of predatory journals;
c. Use software tools to detect 'Plagiarism'.
d. Ensure the compliance of Organisational / Institutional guidelines by the authors.

9. Recommendations

a. The need of the hour is to release the pressure generated on the individuals due to recruitment/ promotion policies of the institutes/organisations which are dependable upon the number of research publications. This system needs to be reviewed at the highest level, and the focus should be on quality instead of quantity of work.
b. Each academic or research organisation/institution should have a Plagiarism detection Software to check their students' integrity and faculty's work by ensuring that all content is unique and original.
c. To ensure that training and awareness programmes are held at regular intervals.
d. Predatory journals must be avoided. Use 'Beall's List' as a reference that publishes the periodic updates of the names of such journals; https://beallslist.weebly.com/ ; UGC CARE List https://ugccare.unipune.ac.in/apps1/home/index or any other such resources.
e. Before sending for publication, authors should check their manuscripts for plagiarism using plagiarism detection software made available by their institute.
f. Every Institute / Organisations must have a 'Standing Publications Committee' or any other well designated Division of the Institute that can supervise and help to check the menace of plagiarism.
g. Raw/primary data (both hard & soft copies), related to the publication, must be deposited with the designated division of the institute.

10. Conclusion

- Plagiarism is purely an ethical issue with serious consequences. People often plagiarise, many times unknowingly and sometime deliberately. Unfortunately, digitisation has made copy-paste, a culture, and inappropriate re-use of sources from the websites, online journals and other electronic media widespread.
- The students, researchers, scientists, and all those involved in publishing scientific literature need to be honest. They need to participate in global scientific communication and adopt ethical standards and guidelines. They should be made aware of various referencing management tools, techniques, different referencing styles, and attend programs regarding research ethics. Information professionals can play an essential role towards this end. They are competent enough to contribute towards controlling the menace of plagiarism by developing and organising awareness among the students and researchers at regular intervals.
- To avoid plagiarism, one should focus on the quality of work rather than on the quantity of publications. Various organisations across India (UGC, MHRD, DST, DBT, SERB, CSIR, ICMR, and others) must agree on a standard set of National guidelines for avoiding plagiarism. An updated list of predatory publishers/journals must be made available on the respective organisations' websites. Every care must be taken for selection of journal/publisher where one intends to get his / her work published so that predatory publishers/journals can be avoided.

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Social Media For Library Services

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Abstract: Every single person in the world uses each other to share daily updated information using social media. Social media users are increasing day by day in India .This is how social media is apopular attraction. Because today's generation cannot exist without social media .It has become a necessity.

Social media users share an their thoughts, feelings, documents, photos, videos with others through social media tools like WhatsApp, Facebook, Twitter. This paper explores how social media can be accessed through a library service.

Key words: Social Medias , Library services, Social Media Networks, Communication

1. Introduction

Social media has disrupted the personal and commercial habits of individuals to an unimaginable extent. Just as television turned people who listened to media content into watchers of media content, the social media has created a vast and distributed community of media content creators. The Internet is an opportunity for information acquisition in general and in specialty libraries. Information users using free online resources try to interact with users and add interactive hits. Social media is the name today. It is important that this is how the Internet looks and how people use it these days .This change is only possible with social media. It generally means "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, which allows the creation and exchange of user-generated content." social media is about finding and publishing your information in a better way.

Social Media for Libraries

Many of us have experienced the use of social media from the very beginning in our personal lives. When we are trying to use social media in our libraries or organizations. You must understand the pros and cons of this tool, its uses and abuses, its suitability and its inability. In addition, you need to be aware of the requirements, responsibilities, and commitment of social media in the library.

2. Objectives of Using Social Media in Libraries

Librarians can tweet about events of daily activities in the library.

1. To update the new books, journals and other and new arrivals in library members of interest.
2. The Using instant messenger apps also library staff can send alert messages to the library.
3. patrons for discharge of books and fine reminder
4. The YouTube channel for the library and host events and live Programmes taking place in the library.
5. Sharing library programmes photos using with photo sharing tools like flicker, pinterest.
6. Create a library patron groups for sharing information by using tools like WhatsApp, Telegram.
7. To share the public or private messages related to the library and its services
8. To create groups between the library and users to discuss the new age of information or services.

2. Responsibility Commitment

The basics of social media are easy to learn. Using social media in the library is essential to show the usefulness of your library. When using social media, you have to be aware of responsibility and commitment. Librarians and library staff should spend some time on social media, including giving feedback to library users, interacting with them, uploading documents, sharing photos, sharing information about library programs, and spreading it through social media tools. From then on, librarians have the exclusive right to assign, or share, actions among different users. Also the use of manpower is less. Librarians can understand and learn the features of social media. Use various communication media, such as telephone, Skype instant messaging, short messages, system testing virtual references, etc. to connect and interact with users for conversations, discussions and community partnerships .Use of user-driven and developed tools and comments and technology to understand the growing trend of social media. In terms of its use and

application behaviour The librarian asks for this. Hence, Stephen Abram (2005) says "Librarian 2.0 is the guru of information age". Anyone who is a librarian can handle the equipment well. He is very knowledgeable and experienced in this regard. It builds up the atmosphere of the game in your professional life and in your library, enhances library users, and readers in the library rush to make it loud. And readers and staff make the most of your time, saving you time.

3. Types of Social Media and Their Use in Libraries

Social media is called "social". Society gets better at sharing information. And this is for the community of many people who work to direct library participation to the community. Social media has transformed into many forms. Such as, web blogs, micro blogging, internet forums, social blogs, wikis, photo tagging and, of course, bookmarking. There are six types of social media recognition. Including Collaborative Content Building Review & Opinions, Communication, Multimedia Sharing, Entertainment, and Monitoring.

Some of the social media tools under each of the types are

Type 1: Communication

The type of communication is on the site. It is about connecting with people living online today and exchanging ideas. You can use this tool to connect strangers, friends, fellow thinkers, community and Industry Company to a bond of will.

Facebook

Libraries have always monitored and implemented any new developments, educational developments, and industries for their users. There are many topics to explore in Library and Information Science from Facebook. The research focuses on collaborating with the librarian's experience. In the library services. Facebook support is very important. Users react to understanding and interacting with Facebook. They are very easy to understand and learn.

- ***Instant messaging system*** **–** This reference helps in taking part in the question while answering users' questions while chatting. Besides, it helps the user to be present during desk hours. In this situation (on-line, busy, available) alerts help to inform the library staff about the presence of the service users.

- ***Developing user database*** - Using facilities to connect to the community. Students can be profiled in different groups such as students, scientists, industrialists, old students, guests.
- ***Event posting*** - The Library can organize online events. In which the user can suggest their thoughts. World Book Day, Copyright Day, Social Day, Science Day, Librarian Day, Teacher's Day. Friendship Day, Author's Birthday and Institution Foundation Day inform users that they can use this tool to inform about upcoming institute events.
- ***Posting photographs*** –Posting photos of relevant events of the event and events in the institute, photos taken during the program, student attendance, photos of the institute's Easter year will attract the student .and will help to store the library.
- ***Providing news*** –Google can create an alert system using Google Alerts to let students know about keyword events, hot topics in the news, etc. about the events happening in the library. The selected alert can participate with the community.
- ***Blog –*** We may use blogs to inform users. Helps to access newly published books, borrowed books, research articles published on databases, open access, etc.
- ***Sending virtual gifts*** – Facebook alerts you about birthdays, anniversaries and special events, such as student or teacher assignments. The library can send virtual gifts to community members of this program. Social media does this by sending messages to others. We can also connect to Instagram to make the library work easier.

Type 2: Collaborative Content Building

In this type we can learn and learn about the tool's content management system. Because they use these tools extensively to organize and promote the tool. A tool management add -on is equipped with social media tools. Which allows users to publish, edit, and research tools. The release of the full operation is due to a central inter face. There is a well-defined process and workflow management for the participant environment in device management. This section discusses how you can create your own in Source Connect Management System - Drupal and

Library. Because Drupal has a well-defined device management application and device distribution application that are included in it. There are other CMS that Joomla and Word Press have added.

Drupal:- Drupal is a community developed. Drupal has won the popular Pocket Open Source CMS Award and Webware 100. (Three times in succession) has won some awards. The library supports specific modules, metadata, vocabulary, XML, tool creation, tool management, publishing and promotion. It acts as a proof. Such as distance standards - standard.

Type 3: Multimedia Sharing

The librarian strives to provide users with the latest information and new developments as soon as possible. Librarians face many problems to provide awareness and availability. This tool is very useful in social media tools. Multimedia helps to broadcast videos, photos, library documents, library programs, events in the institute.

YouTube:- Movie clips, TV clips, music are all you can upload and watch on YouTube anytime. Can also upload library events to others. YouTube does the work of entertaining users. So the user is automatically attracted and discouraged from coming to the library to watch the latest video and audio. The user also shares his educational video. Such as quality code, plat form automation, localization, user reviews and annotations, tagging, and downloading liked videos, copyright Policies. These open access videos are available.

Type 4: Review & Opinion

This source is crucial for future action and decision-making to solve problems, as the tools discussed above provide data protection and survey data, etc. No other equipment has been made. In addition the data provided by these tools is exhaustive and can provide information for librarians to make decisions e.g. Drupal

Type 5: Entertainment

You have to understand that the library is not just for reading or studying but also for entertainment. The library is a place for entertaining and engaging social values while connecting users or communities. Which is a society that promotes community cohesion, socialization and the preservation and promotion of cultural values. The library is always trying to reach readers on the basis of traditional patronage. Information is provided through cultural events, historical stories, sports celebrations. The archives of ancient books are stored in the library and

their information is given to the present generation. Its video is also uploaded by social media and saved.

Type 6: Monitoring

When the library incorporates social media tools into the library .And when the web presence is there, the user is ready to spend time, and resources. We spend time posting updates to the library. It should be evaluated to update the library page, increase the web properties, wait for some points to be checked back in to connect with the community. Help readers understand the impact of library services and make decisions.

4. Conclusion

The use of social media in the library has steadily increased his collection. Helps to provide and disseminate library services as quickly as possible. With this, responsibility is also maintained. The library staff also performs its functions honestly. Also, it saves time as it saves the reader. The information the reader needs is made available in a short time. Thus, the tendency of readers to lean towards the library automatically. The entertainment viewers are celebrated in the library but the video is watched by the reader, so he is attracted to the library. This is why "we are not part of the problem .But we are part of the solution. ''

For this reason, any library service should have SWOT (Strength, Weakness, Opportunity and Threat) analysis implemented, service delivery and promotion.

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Goods and Bads of Web Discovery Tools: A Review of Literature

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Abstract: Libraries are considered as the heart of the education system to circulate information resources and support the goals of the education system. User's expectation from libraries is to get enough resources to select relevant information for their defined work. The involvement of internet and web based technologies makes visible changes in information access and retrieval in the libraries. It is essential for libraries to deliver services that support the advancement of information access and retrieval in the modern web environment. Libraries are adopting and implementing new software programs and techniques to foster the need and expectations of the users. This paper explores the involvement of web discovery tools in libraries of higher education institution in India. The study serves to update the librarian's knowledge on the latest trends in the development and involvement of web discovery tool for resource discovery and user interfaces in the library. Also, assist them in resolving the issues related to the adoption of a web discovery tool.

Keywords: Electronic resources, e-resource management, access management, Discovery Services, Web Discovery Tool, Academics Libraries.

Introduction

Education system is incomplete without the existence and involvement of library and information resources. One needs not use the library on a daily basis but needs library support and information resources to achieve their academic growth. Libraries provide the information resources directly or indirectly to their committed users in different formats (printed, electronic). But due to the modern ways and involvement of information communication technologies information publication and access diverted more toward electronic format. E-resources offers easy and simple information access with updated information makes the user

attracted towards them which makes the libraries have to make the collection suitable for the need of their patrons.

No doubt, Academic Libraries are handling a huge amount of e-resources to support the high demand of the academic users included graduate, postgraduate, research scholars, faculty and staff. These libraries are trying to provide the maximum support by acquiring and managing the e-resources for uninterrupted information access to their users. The management of e-resources is quite complex and time taken process comparatively to the print resources in the library collection. Various aspects that make the management of these resources complex are: low budget of a library, high demands of e-resources by users, complex policies of publishers, technical issues like inadequacy of tools to support e-resource management integrated system for information storage; lack of automated tools.

Having a collection of information sources (in any format) does not mean that the library is fully achieving the aim, it is required to make the use of these resources by the committed users. To make the resources accessible libraries acquired several software's for different purposes like library automation software, digital repository software, content management software etc. Nowadays, Web Discovery Tool is taking attraction of libraries to manage the discovery portal for their e-collection to provide one-stop search window for the users. Libraries of Higher Education Institutions in India are adopting Web discovery tools for discovery and access management of e-resources. This paper discussed about the concept, functionality and importance of the web discovery tools reveals from the available literature. The paper will also explore several factors associated with web discovery tool in providing access to the overall collection of the library.

2. Discovery Services

Discovery services used by libraries to connect their users with the available resources in the collection of the library. Previously, when print resources of information were the only collection in the libraries, the techniques used by libraries to make a connecting platform between users and the resources are: shelf arrangement, catalogue development, and standard bibliographies. With the Integration and advancement of information and Communication Technology (ICT) in the libraries Machine Readable Catalog (MARC) developed in 1968 and then Online Public Access Catalog (OPAC) with Integrated Library System (ILS) was used for resource discovery in the libraries. From then we have several other tools (Federated search etc.) are used to make all the libraries resources easily discoverable by users. Nowadays, Web Discovery tools are started to implement

by libraries for providing single-window search to the whole collection of the Library. This section provides a detail description of these tools and listed out some major web discovery tools.

3. Web Discovery Tools

Web Discovery tools came existence for several years, the addition of an overwhelming amount of e-resources in the library and inability of the traditional discovery tools, and federated search services gave the way to the Web Discovery tool development. In 2005 Marshal Breeding discussed the concept and need of this tool just after the launch of Google Scholar. In 2007 OCLC's WorldCat Local appeared in existence, then in 2009 Serials Solutions' Summon, and in 2010 EBSCO Discovery Service (EDS), Innovative Interfaces' Encore Synergy and Ex Libris' Primo Central came in existence.

Definition of the Web Discovery Tool

Web Discovery Tools are used as a search engine and provide a single search (like Google) of the world of online catalog, databases, e-journals, digital collections, etc. either licensed, open access or institutions own. These tools use their own indexes to the library e-resources and then match the need of the information user and offer a consistent search result. Authors defined discovery services in the context of resource discovery and access to the library collection.

Sarkara and Mukhopadhyay, (2016) described the discovery interface as "next-generation catalogues" with advanced end-user interface, have the ability to replace OPAC modules in Integrated Library System(ILS). Discovery services provide an interface (includes faceted navigation relevancy-based search results) with simple google like single interface through with users can put their query for information.

Sonawane, (2017) highlighted the discovery services as "the extension of the third-generation library catalogues". The discovery tools are used as a search engine and provide a single search (like google) of the world of the online catalogue, databases, e-journals, digital collections, etc. either licensed or open access.

Features of Discovery Tools:

The most highlighted features picked from the literature included: provides a single search window; integrated index of full text or just the metadata helps the users to get more reliable information from the library collection; ranking algorithm of relevance result with respect to the need of the user; facets search

refined by facets like the subject, author, type of material, and format; fast and single set of results tailored to a library's collections

Component of Web-scale Discovery Service

Sahu, (2018) defined two main components to constitute a Web-Scale Discovery Service first is content or resource coverage and second is appropriate technologies. Content requires the ability to index a wide range of content includes in the library. Technology is to search, harvest and index the content and give user interface features in order to provide a user-friendly environment to the end-user.

Promises of Web Discovery Tools

Libraries generally using catalogs to maintain the bibliographic information about the resources. Though it is very useful to maintain the records and act a key to the particular resources of the library but is quite confusing to the users and makes them frustrated easily (Brigham, 2016). Also, these cannot be utilized to maintain the records of e-resources and also provide access to all these e-resources. The other platforms to manage resources including integrated library management systems, and digital repository software's are also not fit to manage e-resources. Although web discovery tools have the ability to provide a simple search interface with relevant results from different library resources spread in various silos. The motive behind Web-Scale Discovery Service is that, makes the content discovered and so increases the chances of being utilized. **Brigham, (2016)** categorizes the advantages of web discovery tools into two main categories: one is the ease of use and improved efficiency.

Web discovery tools provide access to all the electronic content including prosperity as well as tha local collection. The four possible scenarios for the future of library discovery tools (Tay, 2014):

i. **Discovery Dominant**: Web-Scale Discovery continues to grow and become the prime source of discovery sources of information.
ii. **Discovery Deferred:** Web-Scale Discovery continues to be used alongside other tools.
iii. **Discovery Diminished:** Web-scale discovery services have been displaced in their discovery role, and are used for known item search only.
iv. **Discovery Decommissioned:** The whole system is removed and doesn't even use for known item search.

Problems in Web Discovery Tools

The primary problem associated with the Web Discovery Tool is the cost of the tool is difficult to adjust with the budget of the libraries. Apart from this integration of different databases with a discovery tool also quite complex (Tredwell, 2013). If the particular database is not integrated with your discovery tool, the search results will not display the resources from the database. **Narayanan and Byers, (2017)** highlighted the issues with discovery tools and suggested desired improvements. The major drawbacks discussed include lack in coverage of metadata standards, indexing, relevance ranking, publication, finder, linking mechanism and personalisation of searches. The author suggested that web discovery tools need improvement and must improve the functionality to attain the goals of being a credible starting point for research.

4. Objectives of the study

The objectives of this paper are as follows:

- To discover the different Discovery Services.
- To study the benefits and limitations of Web Discovery Tools.
- To explore the searching criteria in the discovery services.

5. Methodology

The study is based on the literature already available in the context of Web Discovery Tools. The author explores the concept and facts related to Web Discovery Tool from different research articles available in different journals and websites.

6. Review of Literature

E-resources grow at an enormous rate which makes the academic libraries face difficulties in coping up with the management strategies, tools, and techniques. Traditional ways to manage the information resources are usually more effective for the print material. A major part of the available literature about e-resources management is based on the awareness about the availability of e-resources, purpose of use of e-resources, type of the users, type of e-resources in the library, satisfaction level of the user, lack of proper training and less number of computers are available, internet facility, factors which influence the effective use of e-resources, **Sahu, (2013); Jebaraj, (2018); Sharma, Gautam & Shrivastava,**

(2019). Variation in information need, information format, tools and technologies makes Libraries deals with new software's to support the same. Web Discovery tool is the current topic of interest for the libraries. Some of the studies reviewed here under the same topic.

Way, (2010) analyses the impact of Summons on e-resources over a short period of time (i.e. after one semester of implementation) by investigating statistics from Google Analytics, database providers, journal publishers and the Libraries' link resolver. The use of Summons increases the usage of full text resources from full-text database, online journal collections, and reduces the use of Indexing and Abstracting databases.

Yang & Wagner (2010) evaluated and compare seven open source and ten proprietary discovery tools to find out how much discovery tools have achieved towards becoming the next generation catalogue. They used 12 features of next-generation catalogue and found that though discovery tools have many features of next-generation catalogue, but the two important features federated searching and relevancy based on the circulation are missing in both open source and proprietary discovery tools.

Gross & Sheridan (2011) studied the way of university first year undergraduate students using a web discovery tool "Summon" by observing their activities to search the information from the website of Edith Cowan University (ECU) Library. ECU library introduced summon and replace all the options of search information (catalogue, reserve collection & databases) to a single Summon search box and named it "Library One Search". The finding of the study showed the new interface was effective and simple to use for the students. The researcher found that multiple choices for resource discovery on the Library website made the students struggle and suffer complexity to find the information and the Summon help to reduce this struggle.

Hoeppner, (2012) evaluated the services of web-scale discovery and stated that the discovery service deletes the information from the search and it can retrieve the full text. He also opined that Common Programming standards are regarded in the field of library science as "discovery layers"

Thomsett-Scott & Reese (2012) provided an extensive survey of literature and come up with the findings that discovery tools have many advantages to the users including one-stop searching, limiting by facets, and citation information. Also, several issues considered as disadvantages of discovery tools including too many results, lack of relevancy, not all content included, loss of catalog specificity, loss of database functionality and user knowledge.

Asher, Duke and Wilson (2013) compared EBSCO Discovery Service (EDS), Summon, and Google Scholar with the conventional library resource (catalog) discovery with a mixed group of students from Illinois Wesleyan University and Bucknell University. They made five groups of students and asked them to search for four research questions by using different tools (EDS, Summon, GS, the library catalog and research databases, and a "no tool" group). The finding shows that EDS surpass all other search system selected for the study.

Daniels and Robinson (2013) described the need for discovery products and explain the usefulness of implementing "Summons" a web discovery too in the Grand Valley State University (GVSU). According to the researchers, the library needs to implement a discovery tool to serve the users with a simple, single search box search interface. The researchers suggested that if any library wants to or already implemented the discovery tool, need to clear with five concepts (called them five questions) will help the library throughout the process: Do we want Web-scale discovery?; Where and how do we want to present our Web-scale discovery?; Define the audience for the Web-scale discovery product?; Need for giving information about it.; compatibility of Web-scale discovery with the library system? The researcher listed out the usefulness of summons: 1. Deliver the faster, simpler, comprehensive search that makes the patrons satisfied in gaining access to the library resources; 2. Presented search options, such as "find articles" or "find books and media," are on searches with facets applied; 3. Have the ability to direct he patrons to the best subject-specific resources for their needs; 4. Provides demonstrate features, ability to log in, save searches, and e-mail results.

Davidson & Collins (2013) described the EBSCO's strategies and philosophy for creating a single search box behind the discovery service. Collins pointed out that students start their search with the internet, because there they provided a single search box for everything (e-books, e-articles, e-encyclopaedias etc.) on the web. The researchers described the search capability of EBSCO discovery service, is to make available all the resources of the library through a single search box.

Goodsett (2014) did the comparative study of three discovery services EBSCO Discovery Service, Ex Libris' Primo and Serials Solutions' Summon. The major criteria's used by author to have the comparison are price, content, user experience, feature and functionality and back-end configuration. The author suggested that though these tools have various strengths and weakness, but the decision of making selection of these tools varies with the need and situations of the institutions.

Aharony & Prebor (2015) did an explorative study of Librarian and information professionals of libraries in Israel based on the Technology Acceptance Model (TAM), emotional variables and Big Five model. The study explores the satisfaction of the librarians and informational professionals towards discover tools. The finding of the study shows, satisfaction with the discovery tools is depends on the attitude of the librarians and informational professionals toward the discovery tool. The author reveals personal characteristics of openness to the experience affect the librarians and informational professionals toward discover tools.

Chatterjee & Das (2015) discussed the in house discovery service "eSearch Software" provided by the Central Library of IIT Kharagpur. According to the authors, this discovery software is very handy and useful to those users who are searching for books on the title name. But it does not perform any full text search. The author summarizes the characteristics of discovery services and tools into a check-list of 12 features also checked the major comparison between Proprietary Discover tools.

Ciccone & Vickery, (2015) compared the number of relevant search results found using Summon, EBSCO Discovery (EDS), and Google Scholar. They concluded that "Because there was no significant difference in the search performance of Summon and EDS, any decision to purchase one product or the other should be based upon other considerations**.** They also, highlighted that Google Scholar performance is similar like Summon and EDS (EBSCO Discovery System) for known-item searches, but outperformed both discovery products for topical searches".

Deodato (2015) proposed the five key principles to evaluate any discovery tool these are inclusion, goal-oriented, data-driven, user-centred and transparent. The author also suggested an evaluation plan in eight steps which helps the academic libraries to make an evaluation before making a decision of implementing a discovery tool. The author offers five main requirements to select Web Discovery Services: content, functionality, usability, administration and technology.

Gavali (2015) described the use of Google Custom Search Engine (CSE) as a discovery service for library resources (subscribed, unsubscribed and open access). The researcher provides an explanation about the different features of (CSE) for customization including search to the site, view it on the web, control panel (adding site, modification of looks), and setup used to set the language, provide a description, keyword, image search, etc.

Stone, (2015) showed the effect of the implementation of Summon on different resources available in the Library of University of Huddersfield. The findings of the study highlight the impact of Summon on different resources like a little impact

on large multidisciplinary and special business publishers. A great positive effect on the usage of the content of publishers who were not promoting themselves as a resource and available via abstracting and indexing databases and federated search system. The full-text aggregated databases and society publishers saw a similar impact i.e. if the content is available to the discovery resource there is an increase in usage of the content else they face a decrease in usage by the users.

Dulle & Alphonce, (2016) studied to measure the awareness and usage of the discovery tool LibHub among undergraduate students at the Sokoine University Agriculture in Tanzania. The researcher found that those students who have attended information literacy training at the university are aware and used LibHub. The finding of the study also reveals that the use of LibHub saves the time of the users in searching the information resources.

Evelhoch, (2016) discussed the application of web discovery tools in integrated library management and retrieval system for any type or size of a library.

Pal, (2017) provided an overview of the library resource discovery environment and explain the role of these in the evolving information landscape in scholarly communications. The researcher also provided the case study of the adaptation of library resources discovery tool "VuFind" in Central Library, Tripura University.

Allison and Mering, (2018) gathered opinions about the current state of discovery tools among the Association of Research Libraries (ARL), academic libraries and to identify any trends they are pursuing. The most highlighted features of Discovery Tools found in the literature are Simple Interface single search box, Integrated Index of collection, Ranking Algorithm for relevance results and Facet Search.

Mandal, (2018) did the implementation of an open source discovery tool VuFind and made integration with Koha. The major task involves importing bibliographic data from Koha and display in VuFind, easy access of data and bibliographic information, display of Emerald records in VuFind and advance search functionality.

Roy, Biswas & Mukhopadhyay, (2018) developed a prototype web-scale discovery system by using different open source software. The prototype resource discovery framework was able to integrate with any web-enabled online information system. The study is based on the integration of VuFind with Koha and Dspace, along with different databases (commercial/licensed/license-free/open access). The bibliographic data are taken from different databases like IndCat and the Library of Congress to populate Koha and Dspace and then VuFind.

Gupta and Shrivastava, (2019) explored the awareness of library professionals, research scholars and students about new technology included federated

search system web discovery tool and next generation catalogue. The authors did a survey by using a structured questionnaire. Out of 100 questionnaires 87 were received back. The finding of the study showed the need and awareness among the respondents about the new technologies. The authors also heighted that more than 98 percent of library professionals are aware about the library software terminology but not about federated search, web discovery tool and next generation catalogue.

7. Results from the Literature

Most of the studies restate, the analysis of features, importance, and advantages of Web Discovery Tools, the use of Web Discovery Tools by different users like undergraduate students, research scholars and librarian in their day to day information search, and the effect of these tools on single or multiple e-resources.

And, several studies based on the awareness of library professionals, research scholars and students about the Web Discovery Tools.

Also, several studies based on the implementation of the Web Discovery Tool and comparison and evaluation of two or more web discovery tools over the features and usability.

Also, some studies are based on the development of a prototype web-scale discovery system by using different open source software's.

Some Discovery Tools Listed Out from The Literature

1. EBESCO Discovery Services (EDS)
2. SUMMONS from serial solutions/ProQuest
3. Primo from Ex libris
4. Worldcat Discovery services from OCLC
5. VuFind
6. Knimbus
7. Black light
8. e-xtensible catalogue
9. VuFind
10. Discovery service through Google custom search engine (CSE)
11. AquaBrowser (Serials Solutions)

8. Conclusion and Further Study

There exist several systems like integrated library management system, authentication system, link resolver service with knowledgebase, the listing of e-resources, etc. used to manage the e-resources in the academic libraries. Nowadays, Web Discovery Tools also, adopted by libraries to improve the discovery and access of the e-resources. There is a need to study more about these tools and utilize them more beneficial for effective resource discovery in the libraries.

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Student Engagement With Teaching Departments Through Social Media: A Study of Jammu University Students

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Abstract: Social media has influenced teaching and learning as it has proved to be an effective way for teaching departments of University of Jammu to promote networking and supplement engagement with the student community. The present study attempts to find out the perception of students towards social media and their engagement with respective teaching departments of University of Jammu through social media especially during the current situation when there is emphasis on online teaching due to COVID-19 Pandemic. To meet the purpose of this study, an online survey is conducted on the students of University of Jammu under which questionnaires (developed in Google forms) are distributed among the students for the collection of data which is then analysed with the help of statistical tools. The derived information from the questionnaires tells about the various social media platforms used by the students, purpose of using them, engaging frequency with teaching departments, purpose of engagement, etc. It also reveals students' satisfaction with social media content and problems faced by them while using social media channels of respective departments.

Keywords: Engagement, Social media, Social media platforms, Teaching departments and University of Jammu.

1. Introduction

Social media is a web based technology that has greatly transformed our way of communication and sharing information. The initiation of social networking sites led by the development of internet paved the way for sharing of thoughts, information and other commodities in the networked environment. The networking sites are also called as social media. Social media has proved to be an effective way of knowledge transfer during the COVID-19 pandemic. Social media has played an important role for student fraternity in clearing doubts, communication with teachers, information accessing and related academic activities.

2. Objectives of the Study

The present study is carried out with following objectives in mind:

- To find out the purpose of using social media.
- To find out the frequency of engaging with teaching departments through social media.
- To know about the purpose of engaging with department's social media.
- To figure out if the students download the content posted on social media channels of their respective departments.
- To observe the problems faced by the students while using social media channels of their respective departments.
- To observe the satisfaction with content posted on social media by the departments of the responding students.

3. Scope of the Study

This study is aimed to know about the engagement of students with teaching departments through social media. The study is limited to the students of University of Jammu, Jammu. The sample of the study is confined to 144 students from different teaching departments of the University of Jammu.

4. Research Methodology

In order to collect data pertaining to this study, survey method of research is followed. An internet based survey is done to meet the requirements of the study. Google forms were given out online to the students of University of Jammu by means of social networking sites.

The data received from the responding students is analysed and interpreted with the help of statistical tools.

5. Analysis of Data

Gender of the Student

Table 1: Gender of the student

Sex	Percentage (%)
Female	56.25
Male	43.75
Transgender	0
Total	100

In above table 1, it is shown that number of male responents are 43.75% while that of female respondents are 56.25%.

Age of the Students

Table 2: Age of the students

Age group	Percentage (%)
Below 20	10.4
20-24	27.1
24-28	54.2
Above 28	8.3
Total	100

From table 2 above, we can see that most of the respondents are from the age group of 24-28 years whose percentage stands for 54.2%, 27.1 % are from the age group of 20-24 years, 10.4% are below 20 years and rest 8.3% are above 28 years.

Course of study

Table 3: Course of study

Course	Percentage (%)
UG	27.1
PG	52.1
M.Phil/PhD	20.8
Total	100

The course of study of the students is shown in table 3 from where it can be analysed that 52.1% respondents are post graduate students, 27.1% respondents are undergraduate students and 20.8% students are research scholars.

Social Media Platforms used by the Students

The social media platforms that the students use is shown in table 4 and figure 1 below:

Table 4: Social media platforms used by the students

Platform	Percentage (%)
Facebook	45.8
WhatsApp	75
Twitter	22.9
Instagram	60.4
YouTube	64.6
Blogs	8.3
Tumblr	Nil
Other	4.2

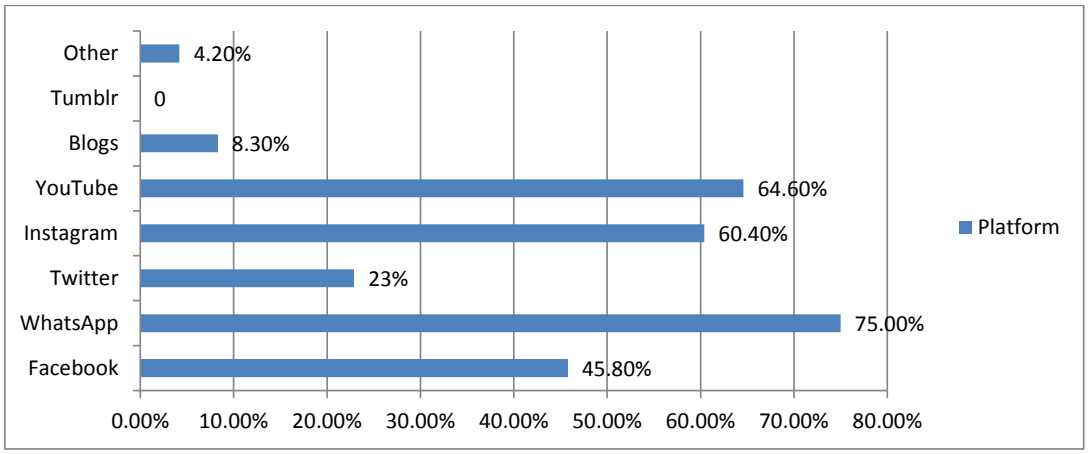


Fig.1 Social media platform used by the student

It can be seen from above table 4 and figure 1 that whatsapp is used by 75% of the respondents, YouTube by 64.4% respondents, Instagram by 60.4%, Facebook by 45.8%, Twitter by 22.9%, Blogs by 8.3% and other by 4.2% respondents.

Duration of being a user of social media

Table 5: Duration of being a user of social media

Duration	Percentage (%)
Less than 1 year	6.3
1-2 years	10.4
2-4 years	18.7
More than 4 years	64.6
Total	100

The duration for which the respondents have been using social media is shown in table 5 above. 64.4% of the respondents have been using social media for more than 4 years, 18.7% for 2-4 years, 10.4% for 1-2 years and 6.3% for less than a year.

Average time spent on social media by the students

The average time spent on social media by the students is shown in table 6 below where it can be seen that 45.5% respondents use social media for 1-3 hours, 29.2% for 3-6 hours, 22.9% for more than 6 hours and 2.1% for less than one hour.

Table 6: Average time spent on social media

Time	Percentage (%)
Less than 1 hour	2.1
1-3 hours	45.8
3-6 hours	29.2
More than 6 hours	22.9
Total	100

Reason for the use of Social Media by the Students

The reasons for the use of social media by the students are shown in table 7 and figure 2 below:

Table 7: Reason for the use of social media

Reason	Percentage (%)
To access information	64.6
Entertainment	54.2
To socialize/make contacts	43.8

To keep in touch with family and friends	41.7
To relax	39.6
Other	8.3

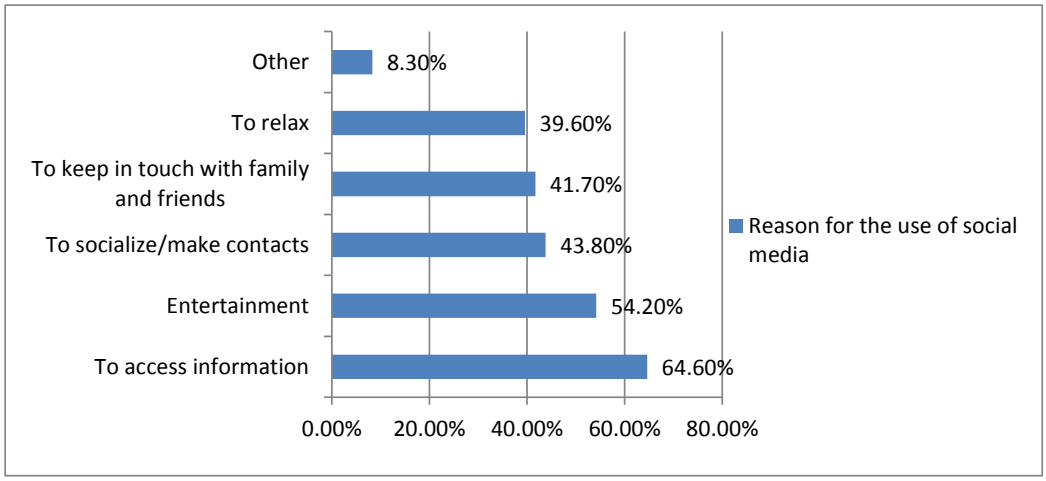


Figure 2: Reason for the use of social media

From table 7 and figure 2, it can be seen that 64.6% respondents use social media to access information, 52.2% for entertainment, 43.8% to socialize and make contacts, 41.1% to keep in touch with their family and friends, 39.6% to relax and 8.3% for other purposes.

Frequency of engaging with the university departments through social media

The respondents were asked about the frequency of engaging with the university departments through social media and their response is shown in table 8 below:

Table 8: Frequency of engaging with department through social media

Frequency	Percentage (%)
Always	16.7
Often	12.5
Sometimes	33.3
Occasionally	25
Never	12.5
Total	100

From above table 8, we can see that 16.7% respondents always engage with their departments through social media, 12.5% often engage, 33.3% engage sometimes, 25% occasionally and 12.5% respondents never engage with their teaching departments through social media.

Purpose of engaging with department's social media

The purpose of engaging with department's social media is indicated in table 9 and figure 3 below:

Table 9: Purpose of engaging with department's social media

Purpose	Percentage (%)
Online classes	44.7
Communication with teacher	42.6
Attending seminars	34
To ask for information	44.7
To clear doubts	36.2
Other	6.4

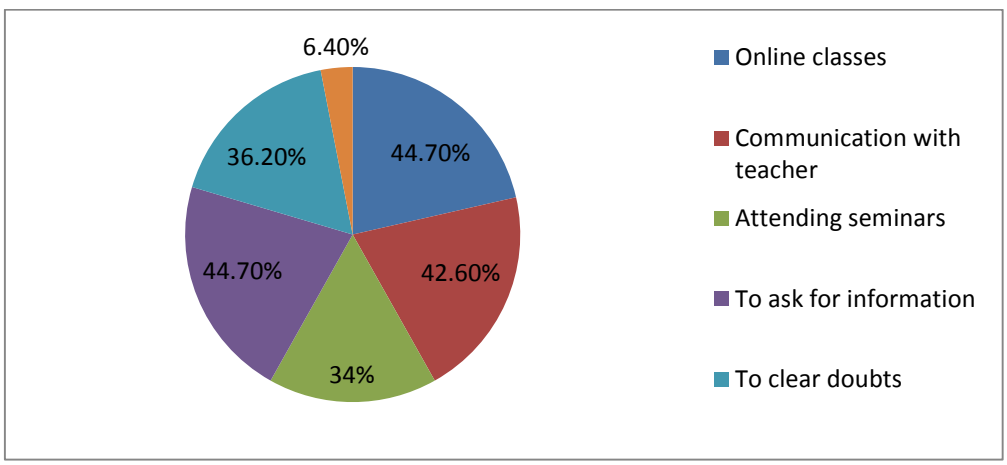


Figure 3: Purpose of engaging with department's social media

In table 9 and figure 3, the purpose of engaging with department's social media is shown where it is clear that online class (44.7%), communication with teacher (42.6%), attending seminars (34%), asking for information (44.7%), and clearing doubts are the reasons behind engaging with department's social media.

Frequency of reading or downloading the content by the students posted on social media channel of their departments

The frequency of reading or downloading the content by the students posted on social media channels of their departments is shown with the help of table 10 and figure 4 below:

Table 10: Frequency of reading/downloading social media content

Frequency	Percentage (%)
Every time	22.9
Usually	27.1
Frequently	20.8
Sometimes	22.9
Occasionally	6.3
Rarely	Nil
Never	Nil
Total	100

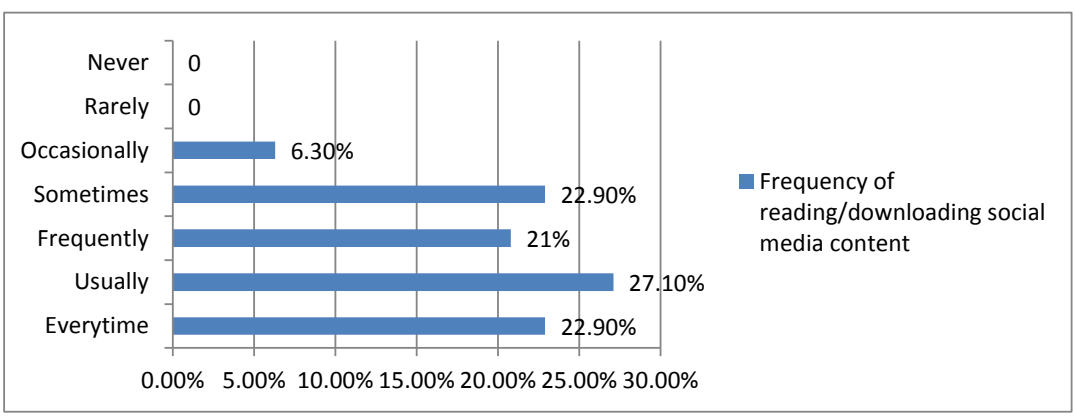


Figure 4: Frequency of reading/downloading social media content

Factors responsible for low engagement with department's social media

The respondents were asked about the factors causing low engagement with social media of their departments. The factors are: lack of promotion by the department about the applicability and usability of its socil media channel (29.2%), unawareness (14.6%), low interaction (31.2%), unintersted content (10.4%) and

insufficient information (14.6%). Their response is also shown in table 11 and figure 5.

Table 11: Factors responsible for low engagement

Factor	Percentage(%)
Lack of promotion about its applicability and usability	29.2
Unawareness	14.6
Low interaction	31.2
Uninteresting content	10.4
Insufficient information	14.6
Total	100

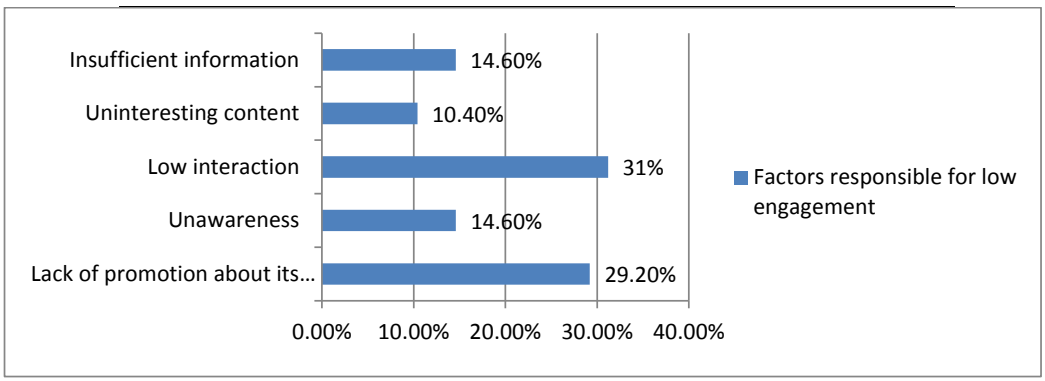


Figure 5: Factors responsible for low engagement

Problems faced by the students while using social media channels of their departments

The respondents were asked about the problems that they face while using social media channels of their departments. Their response is indicated in table 12 and figure 6 below:

Table 12: Problems faced by the students in using social media channels of their departments

Problem	Percentage (%)
Information overload	20.8
Poor connectivity	25
Bulk messages	27.1
Data usage	4.1

Managing time	12.5
Jealousy and competition	4.1
Other	6.3
Total	100

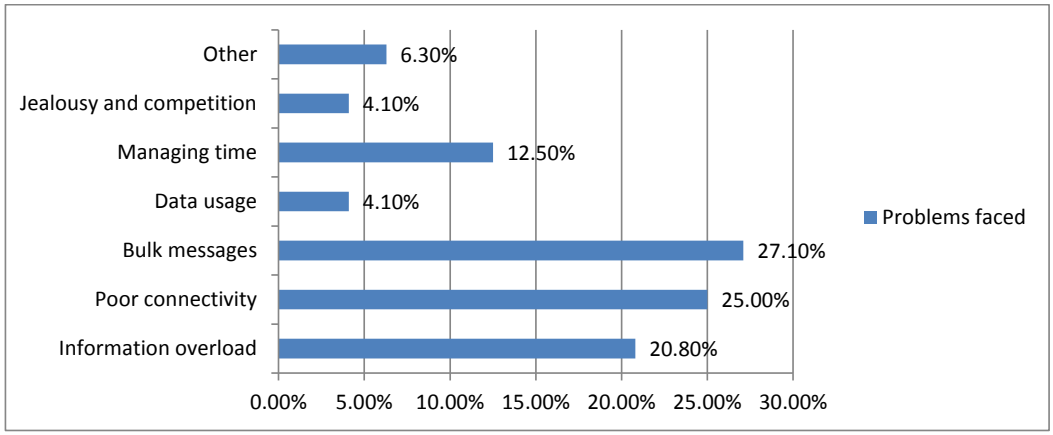


Figure 6: Problems faced by the students in using social media channels of their departments

The problems faced by the students as indicated in table 12 and figure 6 are: information overload (20.8%), poor connectivity (25%), bulk messages (27.1%), time management (12.5%), jealousy and completion (4.1%) and other (6.3%).

Satisfaction of the students with content posted on social media channels/platforms of their departments

The satisfaction of the students with content posted on social media channels/ platforms of their departments are shown in table 13 below:

Table 13: Satisfaction with contents posted on social media

Satisfaction	Percentage (%)
Very satisfied	22.9
Satisfied	45.8
Unsure	22.9
Dissatisfied	8.4
Very dissatisfied	Nil
Total	100

From table 13, it is clear that 22.9% respondents are very satisfied with the content posted on social media channels/platforms of their departments, 45.8% are satisfied, 22.9% are unsure and 8.4% are dissatisfied.

6. Conclusion

From the study it can be concluded that the male participants (43.75%) are less as compared to that of females (56.25%) and most of the respondents are from the age group of 24-28 years (54.2%). WhatsApp is the most preferred social media platform by the students with 75% students being its users. The main reasons for using social media platforms are to access information and entertainment. Online class (44.7%), communication with teacher (42.6%), attending seminars (34%), asking for information (44.7%), and clearing doubts are the reasons behind engaging with department's social media. There are some factors for low engagement of students with their departments like lack of promotion about its applicability and usability, unawareness among the students, low interaction, unintersted content and insufficient information

The students had to encounter some problems also while using the social media channels of their departments like information overload, poor connectivity, bulk messages, time management, jealousy and completion and other issues. Talking about the satisfaction of the students with the content posted on social media channels of their respective departments, most of the students are found to be satisfied.

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Use of social media networks by Library and Information Science students of Panjab University Chandigarh: A study

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Abstract: The present survey research is focused on use of Social Media Networks (SMN) among the Library & Information Science (LIS) students of Panjab University, Chandigarh. A close ended questionnaire has been used for data collection with convenience sampling method. A total number of 43 valid responses have been recorded form LIS students where 74.4% students are female and 25.6% are male. Majority of the students are between the age group of 23-25 and 26-28 years. 93% students were using SMNs daily and 74.4% students were using SMNs since more than 2 years. 90.7% students were using smartphone to use SMNs and most uploaded information on SMNs was video/photo/audio (69.8%) and education information (67.4%). WhatsApp (M=4.65) and You Tube (M=4.19) are most used SMNs. Job advertisement & news (M=4.33) and career relation information (M=4.26) were found main purpose of using SMNs. However slow internet connection and loss of security and privacy (M=3.37) were main hurdles in using SMNs.

Keywords: Social Media Networks; LIS students; Panjab University.

1. Introduction

Social media networks (SMN) are virtual communities which provides a platform for sharing different kind of information with other similar people. The popularity and user count of SMNs is continuously increasing as SMNs are proving multiple way to communicate with like-minded people. All these SMN platforms are grounded on the principle of relationship maintenance, where the people of similar interests are connecting (Boyd & Ellison, 2007). Many of studies with regards to the SMN are focused on user's profile pages, mainly about how the users are reflecting themselves on their profile pages and how they communicate and what

type of information they share with families and friends via SMN (Liu, 2007; Boyd & Ellison, 2007; Boyd D., 2008; Tong, Heide, Langwell, & Walther, 2008). In the present study, the authors are trying to know the usage pattern of social media networks among students of library and information science at Panjab University Chandigarh. It is being tried to enquire about what is their using behavior, purpose and problems being faced during the use of SMNs.

2. Literature Review

Divya & Sudhir (2019) investigated the scholarly usage of social networking tools & services among the doctoral students of the University of Kerala in their study entitled "Use of social networking tools and services among research scholars at the University of Kerala." The study found that the primary preference to use such tools & services was email and WWW and significant problems which scholars face in that was highlighted as overloaded information and some distraction from the main aim for assessing the internet. After email, search engine & google scholar were found widespread usage in social science & arts faculty instead of commerce faculty. Asiedu and Badu (2018) tried to enquire the aspects that inspire the regular use of social media by 204 students of sociology from two universities in Ghana, and they heavily rely on social media websites for the usual daily activities in their study entitled "motivating issues affecting students' use of social media sites in Ghanaian tertiary institutions." The study found that 92.5% of users from both the universities prefer WhatsApp, followed by YouTube and Facebook and 76 % of users visit social media sites daily. The results show the significant correlation between age and visit on social media as the user between the age of 18 to 24 years were found more visited that the age of above 24 on social media. Maintenance of distance relationships was found most forced factor to motive the users to use social media use with an 80.2% response rate followed by information seeking (78.1%), entertainment (72.1%) and academic achievement (59.4%). Further, the results indicated that 84.2% of the students were satisfied and got pleasure accordingly with their preferred social media tool and Facebook is no longer favorite of the youth and WhatsApp was found most preferred communication tool.

Bharti & Singh (2018) explored the use & awareness of SNS among the students of Mahatma Gandhi Kashi Vidyapith, Varanasi, in the study "Use of social networking sites among the students of MGKVP Varanasi: A study." The study found that majority of the students were using SNS daily and among all the social media platforms, WhatsApp was at highest use among the students of all categories i.e., UG, PG & Ph.D. entertainment was found primary reason for using SNS, while

information the students get from SNS was study-related (78%) and video/image is supported by more than 68% students. Hussain (2018) in his study found that 77.66% of LIS professionals were preferred to use social media at their home instead of other places and 75.44% were preferred smartphones as a device to use social media. The main reasons behind using social media were to interact with friends and for professional activities which was supported by 67.92% and 66.04% LIS professionals, respectively. Singh & Gill (2015) found in their study that the main purpose of using SNS includes entertainment (49.7%), communication with family and friends (48.1%) and socialization which supported by 40.5% of the SNS users. About 27.7% of the user was using SNS for the last 1 to 2 years and 70.1% of them spent less than one hour daily on using and preferred place of using SNS was found home (56.7%). 37.2% and 29.2% of users were opined that SNS are time-consuming and misusing their personal information respectively which were considered as major problems being faced by them in using SNS.

Bhatt & Kumar (2014) explored in their study that laptop is used by 90% of the students as a device for accessing the SNS and significant reasons for using such platforms were to get into touch with friends (94%) and plan or invite the people in different events (85.5%), while, 63.4% users think that SNS is totally a time-wasting tool or they don't have sufficient time to use the SNS. 84.7% of students expected the library to get information about new arrivals in the library through SNS. Na´ndez & Borrego (2013) analyzed the different aspects of academic SNS used by academics and Ph. D. students of 12 various universities in their study "Use of social networks for academic purposes: A case study." The results of this research revealed that 67.2% of the total users used academic SN to get into touch with other fellow scholars and 61.4% and 58.7% were used for disseminating the research productivity to others and to follow the activity of other fellow scholars, respectively. Users were using social media for different academic activities and purposes such as consultation of citation indexes (75.4%), communication and using reference management tools (74.4%) and 69.9% of them used for time management.

3. Objectives of the study

The main objectives of this survey are as follows:

1. To enquire the use pattern of social media networks
2. To find out the preferred place and device for using of social media networks.

3. To know about the type of information upload by the LIS students on social media networks.
4. To know about the purposes of using social media networks
5. To identify the problems being faced by the LIS students in using social media networks.

4. Research Methodology

This research is based on survey method in which a close ended questionnaire was used to a data collection tool. The questionnaire contains the question on demographic profile and use of social media networks. Data were collected form a total of 43 students (valid responses) by personally visiting the department of library & information in Panjab University Chandigarh. The analysis was made using the Statistical Package for Social Sciences (SPSS©) version 25.0. Microsoft© Excel Spreadsheet 2013 was used to refine the data presented into tables. Convenience sampling was used for selecting the sample.

5. Data analysis & Discussion

Table 1 is about the demographic profile of the respondents. Out of the total 43 respondents, 32 (74.4%) were female and 11 (25.6%) were male. 8 (18.6%) students were found under the age bracket of up to 22, 20 (46.5%) were found between the age group of 23-25, 11 (25.6%) respondents were found under the age group of 26-28, and there were only 4 (9.3%) respondents in the age group of 29 and above. B. L. I. Sc. was being pursued by 17 (39.5%) respondents and M. L. I. Sc. by 23 (53.5%) respondents and Ph.D. students were 3 (7%) in numbers. 23 (53.5%) students were urban residents and 20 (46.5%) respondents from rural background. 23 (53.5%) students were from government sector background followed by 8 (18.6%) from agriculture background, 5 (11.6%) from private sector and 3 (7%) were from business background. Under the category of annual income of family, 28 (65.1%) students were having the family income between 1 to 5 lakhs; next, 9 (20.9%) respondents were having income of less than 1 lakh and further the income between 5-10 lakh and 10-15 lakh was represented by 5 (11.6%) and 1 (2.3%) respondent respectively.

Table 1: Demographic Profile of the Respondents (N=52)

Demographic Variable		Number	Percentage
Gender	Male	11	25.6
	Female	32	74.4
Age	Up to 22	8	18.6
	23-25	20	46.5
	26-28	11	25.6
	29 and Above	4	9.3
Course or Class	B. L. I. Sc.	17	39.5
	M. L. I. Sc.	23	53.5
	PhD	3	7
Residence	Urban	23	53.5
	Rural	20	46.5
Background of Family	Agriculture	8	18.6
	Government Service	23	53.5
	Business	3	7
	Private Sector	5	11.6
	Others	4	9.3
Annual Family Income	Below 1 Lakh	9	20.9
	1-5 Lakhs	28	65.1
	5-10 Lakhs	5	11.6
	10-15 Lakhs	1	2.3
	More than 15 Lakhs	0	0

Table 2: Use of Social Media Networks (SMNs) (N=52)

Variables of SMNs Use		Number	Percentage
Frequency of accessing of SMNs account	Daily	40	93
	1-3 times per week	3	7
	1-3 times per Month	0	0
	Rarely	0	0

Daily time spent on using SMN	Less than 2 hours	20	46.5
	2-4 hours	18	41.9
	5-6 hours	4	9.3
	More than 6 hours	1	2.3
Time since using SMN	Less than 6 months	2	4.7
	6 Months to 1 Year	4	9.3
	1 Year to 1.5 Years	1	2.3
	1.5 Years to 2 Years	4	9.3
	More than 2 Years	32	74.4
Type of internet access for using SMN	Free (Public Wi-Fi)	7	16.3
	Paid Internet (Personal Network)	26	60.5
	Both	10	23.3
People in contact through SMN	Less than 50	8	18.6
	50-100	12	27.9
	101-150	6	14
	151-200	5	11.6
	201-300	4	9.3
	More than 300	8	18.6
Device for using SMN	Desktop	3	7
	Laptop	11	25.6
	Smartphone	39	90.7
	Tablet	1	2.3
Place of using SMN	Library	11	25.6
	Hostel	18	41.9
	Home	33	76.7
	Department	20	46.5
	Others	16	37.2

Type of Information Uploaded on SMN	Personal Information	15	34.9
	Political Views	13	30.2
	Instant Messenger Address	9	20.9
	Educational Information	29	67.4
	Financial Information	7	16.3
	Professional Information	14	32.6
	Expertise or Skills	15	34.9
	Career Related Information	24	55.8
	Video/ Live Video/Photographs/Audio	30	69.8
	Goals, interests, activities (extracurricular)	15	34.9

Table 2 shows the usage pattern of the social media networks where it was found that 40 (93%) students were accessing SMN's account daily and remaining 3 (7%) were accessing the SMN account 1-3 times a week. Then, it was found that 20 (46.5%) students were using SMNs less than 2 hours in a day, 18 (41.9%) users were spending between 2-4 hours and 4 (9.3%) users were using SMN 5-6 hours. Next, it was observed that 32 (74.4%) users had been using SMNs for more than 2 years, 4 (9.3%) users were found to be 1.5-2 years old and 6 months to 1 year each since using SMN. Later, it was analyzed which type of internet was accessed for using SMN, and it was revealed that 26 (60.5%) users were using paid internet and 10 (23.3%) users were using both paid and free WI-FI for accessing SMNs. Under the category of users who were in contact through SMNs, 12 (27.9%) users have 50-100 contacts, 8 (18.6%) users each have less than 50 and more than 300 contacts. Maximum users i.e., 39 (90.7%) users were using smartphones followed by laptops 11 (25.6%) users and desktop 9 (7%) users. Maximum i.e., 33 (76.7%) users were using SMNs from home and 20 (46.5%) users were using it from the department, 18 (41.9%) from hostel, 16 (37.2%) from other places and 11 (25.6%) users were using it from library. Maximum information uploaded on SMN was video/photograph/audio 30 (69.8%) followed by educational information 29 (67.4%), career relation information 24 (55.8%), personal information/ personal information/extracurricular 15 (34.9% each) professional information 14 (32.6%) and political views 13 (30.2%).

Table 3: Frequency of using social media

SMN	Always N (%)	Usually N (%)	Sometimes N (%)	Occasionally N (%)	Rarely N (%)	Mean	Std.
WhatsApp	31 (72.1)	9 (20.9)	3 (7)	-	-	4.65	.613
You Tube	20 (46.5)	16 (37.2)	4 (9.3)	1 (2.3)	2 (4.7)	4.19	1.029
Facebook	14 (32.6)	11 (25.6)	3 (7)	2 (4.7)	13 (30.2)	3.26	1.677
Instagram	15 (34.9)	9 (20.9)	4 (9.3)	1 (2.3)	14 (32.6)	3.23	1.716
LIS Links	4 (9.3)	14 (32.6)	14 (32.6)	3 (7)	8 (18.6)	3.07	1.242
LIS Portal	3 (7)	8 (18.6)	20 (46.5)	3 (7)	9 (20.9)	2.84	1.174
Research Gate	3 (7)	10(23.3)	10(23.3)	6 (14)	14 (32.6)	2.58	1.349
Slide Share	1 (2.3)	14 (32.6)	7 (16.3)	6 (14)	15 (34.9)	2.53	1.334
LinkedIn	1 (2.3)	4 (9.3)	9 (20.9)	8 (18.6)	21 (48.8)	1.98	1.144
Library SOUP	2 (4)	3 (7)	8 (18.6)	7 (16.3)	23 (53.5)	1.93	1.203
Mendeley	1 (2.3)	2 (4.7)	9 (20.9)	9 (20.9)	22 (51.2)	1.86	1.060
Twitter	3 (7)	3 (7)	5 (11.6)	2 (4.7)	30 (69.8)	1.77	1.306
Zotero	-	2 (4.7)	3 (7)	3 (7)	35 (81.4)	1.35	.813

In Table 3, Frequency of using social media by the users has been evaluated, and it was found that WhatsApp is the highest used SMN platform (M=4.65) flowed by YouTube (M=4.19), Facebook (M=3.26) Instagram (M=3.23) LIS Links (M=3.07), LIS portal (M=2.84), Research Gate (M=2.58), Slide Share (M=2.53), LinkedIn (M=1.98) Library Soup (M=1.93), Mendeley (M=1.87) Twitter (M=1.77) and Zotero (M=1.35).

Table 4: Purpose of using Social Media Networks

Purpose	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)	Mean	Std.
For Job Advertisements and news	19 (44.2)	20 (46.5)	3 (7)	1 (2.3)	-	4.33	0.715
For career-related information	18 (41.9)	18 (41.9)	7 (16.3)	-	-	4.26	0.727
For sharing academic information	17 (39.5)	19 (44.2)	6 (14)	1 (2.3)	-	4.19	0.852
To stay in touch with friends/relatives/ family	15 (34.9)	20 (46.5)	7 (16.3)	1 (2.3)	-	4.14	0.774
For the latest information/ Happening in the LIS profession	14 (32.6)	21 (48.8)	8 (18.6)	-	-	4.14	0.710
To learn how to do things	17 (39.5)	16 (37.2)	8 (18.6)	2 (4.67	-	4.12	0.879
To generate and exchange ideas with others	13 (30.2)	19 (44.2)	10 (23.3)	1 (2.3)	-	4.02	0.801
Instant message (Chat)	14 (32.6)	16 (37.2)	13 (30.2)	-	-	4.02	0.801
For entertainment/ relax/fun/enjoy	13 (30.2)	19 (44.2)	9 (20.9)	1 (2.3)	1 (2.3)	3.98	0.913

Obtaining a wide variety of information about your interest	11 (25.6)	20 (46.5)	11 (25.6)	1 (2.3)	-	3.95	0.785
For Sharing videos/ pictures/audio	12 (27.9)	15 (34.9)	14 (32.6)	2 (4.7)	-	3.86	0.889
For problem-solving	10 (23.3)	20 (46.5)	10 (23.3)	3 (7)	-	3.86	0.861
For expanding the social network	6 (14)	20 (46.5)	13 (30.2)	4 (9.3)	-	3.65	0.842

Table 4 reveals the purposes of using social media networks where it is cleared that LIS students are using social media networks for job advertisement and news (M=4.33) followed by career-related information (M=4.26), sharing academic information (M=4.19), stay in touch with friends/relatives/families (M=4.14), for latest information/happening in LIS profession (M=4.14), to learn how to do things (M=4.12), generate and exchange ideas with others or instant message (M=4.02), for entertainment/relax/fun/enjoy (M=3.98), obtaining a wide variety of information about your interest (M=3.95) and lastly expanding the social networks (M=3.65).

Table 5: Problems faced in using Social Media Networks

Problems	Always N (%)	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)	Mean	Std.
Slow Internet Connection	4 (9.3)	18 (41.9)	18 (41.9)	2 (4.7)	1 (2.3)	3.51	0.827
loss of security and privacy	11 (25.6)	8 (18.6)	14 (32.6)	6 (1)	4 (9.3)	3.37	1.273
Excess of an advertisement on SMN	8 (18.6)	13 (30.2)	10 (23.3)	9 (20.9)	3 (7)	3.33	1.210
Virus and malware attacks through social	2 (4.7)	9 (20.9)	21 (48.8)	6 (14)	5 (11.6)	2.93	1.009
Lack of timing	2 (4.7)	10 (23.3)	14 (32.6)	8 (18.6)	9 (20.9)	2.72	1.182

Ill health effects	5 (11.6)	3 (7)	17 (39.5)	10 (23.3)	8 (18.6)	2.70	1.206
Online Financial frauds	-	6 (14)	16 (37.2)	12 (27.9)	9 (20.9)	2.44	0.983
Lack of IT skill/Tools	1 (2.3)	2 (4.7)	17 (39.5)	12 (27.9)	11 (25.6)	2.30	0.989
lack of knowledge in using SMN	1 (1.9)	5 (11.6)	10 (23.3)	12 (27.9)	16 (37.2)	2.09	1.042
Language problem	1 (2.3)	2 (4.7)	10 (23.3)	15 (34.9)	15 (34.9)	2.05	0.999

Table 5 shows that problems which the students were facing while using social media networks and slow internet connection (M=3.51) is one of the major problems followed by loss of security and privacy (M=3.37), excess of advertisement on SMN (M=3.33) and virus and malware attacks through SMNs (M=2.93). there were some other problems too such as lack of timing (M=2.72), ill health effect (M=2.70), online financial frauds (M=2.44), lack of IT skill/Tools (M=2.33), lack of knowledge in using SMNs and lastly language problem (M=2.05).

6. Conclusion

Social media networks is an important part of youth life nowadays in all aspects specifically in academics and the present research is focused on use of SMNs among the LIS students of the Panjab University Chandigarh. Smartphones made it more convenient to use social media networks which is also observed in this study. WhatsApp and You Tube are most used SMNs, however, some other research oriented SMNs such as Research Gate, Mendeley, LinkedIn, Zotero, etc., were least using by the LIS students was minimal. So, it is being suggested that a proper orientation or workshops should be organized for the students to make them aware of such SMN platforms used for research and academics.

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Theme-5

Collection Development and Open Technology Movement

Role of Librarians in Open Educational Resources with Special Perspective of Creative Commons Licenses

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Abstract: The Librarian working as the manager and advisor for the users of the Library and he need to know the Open Educational Resources and the entire system of Creative Commons Licenses, this system protects the rights of original author and avoid the misuse of the digital content for the commercial use. The process of creative commons registration is very easy to understand for every author, In Creative Commons Licenses procedure neither need any middle man or agent like Patent registration nor any legal procedure, it provides various types of license for author as per the choice. The various types of combinations are also available for the modification of original work.

Keywords: Librarian, Open Educational Resources, Creative Commons License, Combination table

1. Introduction

A Creative Commons (CC) license is one of several public copyright licenses that allow the miss distribution of an otherwise copyrighted "work". A CC license is used while an original author desires to give other people the right to percentage, use, and build upon a piece that they (the author) have created. CC offers an author flexibility (for instance, they might choose to permit simplest non-industrial uses of a given work) and protects the those who use or redistribute an writer's creation from worries of copyright infringement as long as they abide by way of the situations that are specified within the license through which the writer distributes the work. There are numerous kinds of Creative Commons licenses. The licenses fluctuate by way of numerous combinations that condition the phrases of distribution. They had been initially launched in 2002 by Creative Commons, a U.S. Non-profit organization established in 2001.

2. Open Educational Resources

The creation of open instructive assets goes past even the associations that make the materials. There are a huge number of makers Involved in the open source development, however a large number of them do it without acknowledging it. Each time material is made and authorized under alternative Commons (see

http://creativecommons.org) or other "open" permit, there is potential for that material to be utilized in an instructive setting. A significant number of the pictures found in Utah State College's Open Courseware courses were found on the Flicker picture site utilizing the Creative Center hunt. These pictures were initially taken for some other reason, but since the maker picked a Creative Commons permit, they were effectively and lawfully re-utilized on an Open Courseware site. Open education resources can be re-purposed for instruction. Two open space plays from the readings area of the Utah State University OCW Theater Arts course have been made accessible completely for users. Creative Commons and other open licenses permit material the possibility to be promptly re-utilized in an Open Courseware course or other instructive item. Innovative Commons characterizes the range of conceivable outcomes between full copyright all rights saved and the open area no rights held. Much of the time, the main limitations are that the first maker be given attribution, that the work may not be utilized for business purposes, and that adjustments of the work be imparted to the network.

3. Types of Open Educational Resources

OER can be divided into as many "types" as there are needs within the education sector. While assets such as worksheets, lesson plans, lesson resources, reference articles and so on are perhaps an obvious category; the term also encompasses open courseware (OCW). Although there is no consensus regarding OER categories, Creative Commons has a useful list that includes the following types, OER can be separated by content type into four groups: text-led, video-led, animation-led and multiple media. Types of OER include: full courses, course materials, modules, learning objects, open textbooks, openly licensed (often streamed) videos, tests, software, and other tools, Materials or techniques used to support access to knowledge.

- Digital learning objects (individual digital assets);
- Digitized object libraries (online collections of assets);
- OER encyclopedias (collaborative written reference materials);
- Open online archives (repositories of collected OER);
- Open textbooks (free and adaptable texts);
- OER courseware (open online university courses and programmes);
- OER courses (short courses);
- Open course archives (libraries or indexes of courses);

- Online tools that support the open community.
- Other organisations, such as Montgomery College, also include media categories

4. Creative Commons License Conditions

All creative commons license are based on four Conditions and they present with simple symbol for understanding the Conditions of license for other users and also for the search engines for find out what type of information was available in the file like, so the librarians need to inform the users who use the open resources about the symbol and rights of the author.

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5. Three Layers of Creative Commons License

Open copyright licenses divided in three-layer plan. The first layer incorporated the laws that can be understood by user and lawyers that known as Legal layer,

the second layer encompasses with simple code and summary that can be known as common deed which any one can understand easily that is second layer which known as in general human readable format. The last one is machine readable which can be understood by machine like in barcode format which recognize by software and search engines.

6. Registration Procedure for Author

The Librarians need to know the procedure of the registration for the digital open access content for the author. The first stage is to log on the Creative Common Licensing website and then go through the registration link, first the website ask about License Features your choices of the panel that is the first question is Allow adaptations of your work to be shared? And the author need to give the answer is yes, no or Yes, as long as others share alike and the second question is Allow commercial uses of your work? And again the author needs to give the answer was Yes or No.

In the second stage to select the license which was describe in upper part and help others attribute you! This part is optional, but filling it out will add machine-readable metadata to the suggested HTML and the website provides the link for your website the author must to copy it and paste it on your webpage for the information to visitors of author's website.

7. Types of Licenses

The creative commons license system provides six type of license based on the four conditions

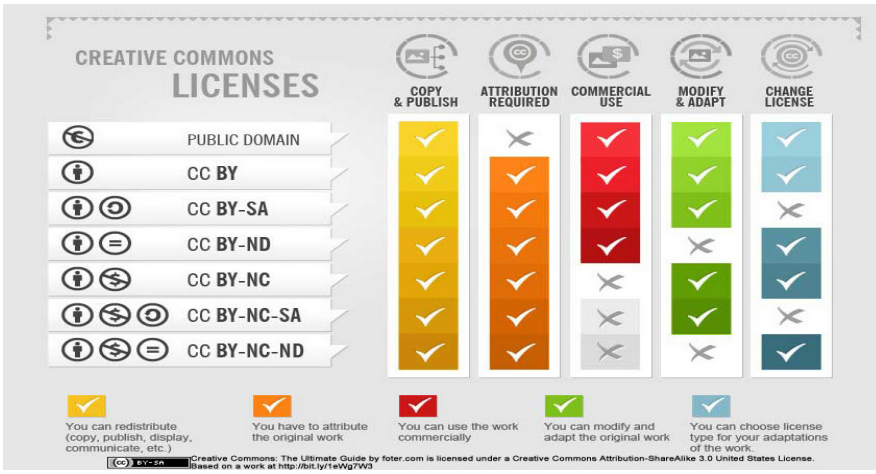
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- **Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)** This is the most restricted license type other than the five because it fully protected the rights by the first author other person able to download it but they do not make changes or use commercially without gives the credit for the original author.

8. Combination Table

- The creative Commons License can be combining with other license the detail information will understand in following table



Source: https://s3.amazonaws.com/libapps/accounts/22857/images/ccinfographic3withlicense.jpg

9. Conclusion

The present paper define the role of Librarians in Open Educational resources and its copyright issues namely the Creative Commons License and how the librarian make awareness in the user who use the resources. The author should know the various types of license and the combinations of use of the resources.

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Use of E-Content Development in Teaching & Learning

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Abstract: In this technological age, today's learners are techno-savvy, that we need to understand and use of ICT technology in our education system, not only use the ICT technology but utilised them such a way that the todays techno-savvy learners get attention in learning process. E-content is a latest media of learning and attracting the attention of the learners. E-Content is a most valuable method to construct or develop the information in electronic form and make available to all at any time, any place, any one to utilised it. Present Paper focuses on Impact of E-Content in teaching and learning process of education. E-content used by teachers those were recently completed the training workshop / Seminar / FDP on E-content Development. Author use questionnaire method for collecting the data.

Keyword: E-Content, E-Learning, Recent method of teaching & learning.

1. Introduction

In the beginning of 20th century technological changes or technological revolutions start with very fast speed. Up to 1960 revolutions speed was slow, but the middle age of the 20th century most of the technology invented. We use audio, video and projector in our teaching and learning then after 1980 televisions, VCR, audio tape was used for teaching and learning. After that computer age was started, Learner learn their topics with the help of computers, smart boards etc. In 1992 Tim Burner Lee invented the WWW this was the most important aspect in education system, with the help of internet or www the learner learns anything at any place at any time with his own convenience. The National Policy of Education (1986) has emphasize the application of educational technology to improve the quality of education at all levels. It has also led a special emphasis on using computers in the teaching learning process. So, the teachers can attempt to develop e-content. E-content is a very powerful tool of education. E-content is valuable to the learners and also helpful to teachers for all individual instruction of systems. E-content is the latest method of instruction that has attracted more attention together with the concept of model. Now in the age of 21st century we are in Interactive age. Today's learners are techno-savvy therefor we need to understand and use of ICT technologies in our education system. Not only use the ICT technology but

utilized them in such a way that the todays techno-savvy learners get attention in teaching and learning process. E-Content is the media for learning for that it is a latest method of teaching that attract learners. It is most valuable method to construct or develop, the information in electronic form and make available to all at any time, any place, anyone can utilize it.

Today's learners are digital native because they know all the tools and techniques of the technological learning whereas the teachers are the digital migrants because they learn how to use the tools and techniques of recent age. Today's learners are multi-model learners, Therefore Higher Education Ministry introduced the new policies about today's teaching aids and tools. Without using new technology today learners will be bored they need technological based learning their capacity of traditional learning or attention of sitting continuously reducing, as learners are smart, teachers will be. As all these influences of technology on our education system E-content lectures or study materials are compulsory by the government. So, government take initiative and started online courses through NPTEL and SWAYAM so that teacher can use these courses for their own and for students. This step started by IITs and some universities. But according to local needs teachers can start their own courses or encourage student for use of technology for education purpose.

Today students take their education while working to earn. So, they miss their classes some time. In rural areas students are working in Farm so they don't have time to attend classes. But they want to take education. So, teachers develop E-Content so that student can learn from anywhere as today every student use mobile so they can use E-content from anywhere and complete their study. Teachers are also care their students so they started to develop e-content and also take trainings regarding developing e-content. Teachers use G-suits or google classrooms for providing e-content or assignment to students as this facility is free

In 7th pay commission, how many contents a teacher create for his subject? will count for his Career Advancement Scheme (CAS) and your Academic Performer Indicator (API). That's why as a part of our teaching we learn about how to create a content, how to make it, how to give the students and learner. All these questions were in mind. Don't worry various tools and Technology are freely available on net creating e-content.

What is E Content?

E-content technical definition electronic content, digital content that can be transmitted over computer networks such as the internet.

E-content is term as electronic content that include text, image, graphics, animation

audio and video sometimes e-content will be single elements carrying any one of the above elements or all of the above together to display offline or online web pages and also to be transferable to computer to another computer and internet.

Electronic content or Digital content is Defined by those involved in creating providing and distributing information as the digital contain which is view on screen and not on paper. With the advent of internet and www the access of information has become very easy and the entire world is moving towards digitisation 21st century student learn in a global classroom and not necessarily with in four walls. They are more inclined through mobile phones and computers or chatting with friends on social networking site. The advancement in technology and the plethora of powerful and innovative digital device and tools have a great potential to improve educational outcomes, educators must understand that the use of digital content and device will improve teaching and learning and the enhance educational opportunities and benefits the millionaires.

According to Oxford dictionary defines E-content as - Digital text and image design for display on web pages. Here in the study E-content refers to which include electronic version of books, journals, maps, media and archival materials that can be used for teaching and learning.

E-content available through TV, radio, phones, multimedia, CD/DVD and internet can also be termed as E-content. In this context the E-content developed in the form of compact disc is considered as an E-content material for the study.

2. Stages of E-Content Development-

E-Content are not ready. Usually teachers create E-content by using UGC Guidelines. There are so many instructional design models are available but same common steps in all of them. Which they are…

1. **Analysis Phase:** It is a most crucial stage because in this stage we plan all the things, what is our target group, what is our content, which method to use for material availability, animation, collecting the data and so on.
2. **Design Phase:** In this phase we use all the data which we think in analysis phase to design our content, planning of an e-content preparation etc.
3. **Development Phase:** In this phase we work actual to creating an E-content with the help of audio, video, text, animation etc. preparing of assignment, quiz for learners etc.

4. **Testing Phase:** In this phase overall error rectify and solved it like spelling, video, audio quality, picture screenplay, various links for references etc.
5. **Implementation Phase:** This phase implements all our e-content share or get available to the target audience.
6. **Evaluation Phase:** Evaluation phase is most important phase in all this process. Because in this phase learners & instructor's feedback are come developer also evaluate its function and responses of learners and make a design to effectively developed of E-content.

3. Features of E-Content

- E-Content is teachers friendly.
- E-Content is students friendly.
- E-Content is technological friendly.
- E-Content is learner centric.

4. Objectives of Study

- To find the attitude of teacher for developing e-content.
- To find the most usable e-content type of teaching.
- To find the most usable LMS (Learning Management System) for publishing e-content.
- To find the most usable Instruction Design Model for creating e-content.
- To find the obstacles and problems in creating the e-content.
- To find out the effectiveness of the e-content for teaching.

5. Methodology and Scope of Study

Author use questionnaire method for collecting the data. Questionnaires will be distributed to teachers from Mumbai university. After collecting the data, data presented in tabular form and analysis is done with the help of statistical tools.

6. Data Analysis

For this study author had been design a questionnaire in Google form for collecting the data and distributed and circulated this questionnaire with the help of social

media like What's App. Author had received 101 responses from various colleges teachers these are affiliated to University of Mumbai. This data presented and analysis with the help of tables.

Table No 01 - Attitude of teachers to develop E-Content

Sr. No.	Perpose of Developing E-content	Respondant	Percentage
1	For the need of today's education process	61	60.4
2	For teaching Perpose	52	51.5
3	College Development	48	47.5
4	Personnel Progression	38	37.6
5	For NAAC Purpose	29	28.5
6	For your API Increment	20	19.8
7	Other	3	3

Table Number 01 indicates that the attitude of teachers to develop the e-content, this attitude arranges in decreasing order. Above data revealed that majority of respondent developed e-content because it is the need of Today's education process, that is 60.4% follows that 50 1.5% respondent use it for their teaching purposes and then 47.5% respondent develop it for college progress and follows are 37.6% personal progression, 28.5% NAAC purposes and lastly 19.8% are there self API increment, from that table It is indicates respondents use e-content for educational and college progression first and lastly there self-increment.

Table No 02 - E-Content type to use

Sr. No.	E-Content type to use	Respondant	Percentage
1	PPT	71	70.3
2	Video	54	53.5
3	YouTube	47	46.5
4	Self Audio and Video	45	44.6
5	PDF Documents	35	34.7
6	E-Text	34	33.7
7	Audio	25	24.8
8	Others	2	2

Table number 2 reflect that till the date most of respondents 70.3% use traditional method of e-content that is PPT because it is most user friendly method of teaching. Then showing the videos those are collected from different sources that is 53.5%. Follows that YouTube videos 46.5% of related topic, 45% respondent use their own created video and audio for teaching. Rest are PDF document 34.7%, e-text 33.7% and audio 24.8%. It means that nearly 50% respondent use recent e-content type that is self-audio and video means the trend of education is slowly but steadily change as technology changes.

Table No 03 - LMS Module use for Publishing E-content			
Sr. No.	**LMS Module use**	**Respondant**	**Percentage**
1	YouTube	40	40.3
2	Google Classroom	34	33.7
3	MOODLE	29	28.7
4	SlideShare	25	24.8
5	SWAYAM	13	12.9
6	LinkedIn	10	10
7	G-Suite	9	8.9
8	SCROM	1	1
9	Others	10	10

From above table we firmly say that, most popular LMS for publishing e-content is YouTube 40.3% YouTube is most friendly to all the educator's and student also. You can get every informational videos on that platform. So our respondent shows that too. Google classroom 34% respondent use it for publish their e-content. Follows that MOODLE used 29% respondent use MOODLE. MOODLE is a modern platform for publishing educational e-content that is also a part of MOOC, which is worldwide recognised. Slowly educators learn about it and use it. Then Slide-Share 24.8%, SWAYAM 13%, a project of Indian government of e-content for teaching and learning purposes. LinkedIn 10% also popularity in educator's. G-Suite and SCROM are not much popular and usable platform to publish e-content other than that responded use various elements like D-Space UDEMY etc.

Table No 04 - Design Module Use for Developing E-Content			
Sr. No.	**Design Module use**	**Respondant**	**Percentage**
1	ADDIE	44	43.6
2	Others / Not Aware	27	26.7
3	SAM	16	15.5
4	Kemp Design Model	14	13.6
5	Gerlech and Ely Model	9	8.7
6	Dick and Carey	6	5.7

Table Number 4 reflex that most popular model for developing e-content is ADDIE 44% because this module is so simple, in its name describe the process of module therefore it is most used model for developing the e-content. Most of the respondents not aware about design module, they use their own method for develop a e-contain. As compared to ADDIE Sam and cam design model. Are follows them in e content garlic and model and dick and Carey model not more than 10% respondent use it.

Table No 05 - Have you face any problem for implimenting and creating E-Content			
Sr. No.	**Problem Face**	**Respondant**	**Percentage**
1	Yes	54	53.5
2	No	47	46.5
3	Total	101	100

Table number 5 problems faced for implementing and creating the e-content more than 54% responded facing the problem while 46 persons are not. we see the most common problem faced by respondent that is…

1. It's so time consuming process.
2. Required necessary equipment.
3. Training for developing and mixing various types of e-content is needed.
4. Internet connectivity.
5. Facing the problem for uploading e-content on any LMS model.
6. Most suitable software and technological.
7. Technical problems like connectivity configuration various software technical skill etc.
8. It is not a single person work.
9. How to give the students no idea?
10. Mostly it need a budget for equipment available in college Institute to create it.

Table No 06 - Use of E-Content Developed by you			
Sr. No.	**Use of E-Conetent**	**Respondant**	**Percentage**
1	10-30	52	52
2	30-50	14	13.7
3	50-70	7	6.8
4	Above 70	28	27.5
5	Total	101	100

Table Number 6 use of e-content developed by teachers. Above table Describe that. Mostly all the students get benefited from e-content developed by their teachers because today student don't have capacity to seat long hours. Their concentration loses in a certain period of time, their mind wants something new, this e-content

gives them like audio video lectures of their teachers, PPT e-text, YouTube videos etc. It shows that study the effectiveness of e-content increase in learning as well as teaching process the e-content once develop teacher distribute are use it at any one. At anywhere at any time.

7. Findings

The present study provides us information about use of e-content its development and implementation. Major findings of the study are…

1. Most of the urban colleges are used e-content in their teaching learning process, whereas rural and semi urban colleges not get proper facility for developing the e-content.
2. More than 90% respondent agree with the policy of government to compulsory use recent technology in education system, therefore government gives a platform like SWAYAM for learning the recent trend. But along that government gives a proper guideline to colleges and institute for implementing it like provision of budget, infrastructure, some extra time including in working hours etc.
3. Respondent of the study use e-content are developed e-content because it is a need of Today's education policy because traditional process, tools are so boring for today's techno-savvy student, therefore today's educational are use it mostly for teaching process and also follows it. Get a weightage in NAAC and its impact on college development. Lastly for its API increment.
4. Today's mostly educational are technology friendly, but not much to create modern types of e-content that is self-audio video mixing, editing etc. Therefore 93% of respondent says that it is must to have a proper training of it. That's why 70% of educator's used traditional method of a teaching that is PPT then showing YouTube readymade videos etc.
5. Learning management system is an important part of Educational policy because without that we cannot publish our e-content, without that we cannot reach anyone, anywhere, at any time. More than 40% educator publish their content on YouTube it is most user friendly LMS system for both

learners and teachers, follows that Google product that is Google classroom nearly 35% of respond use it for their work purposes Government of India SWAYAM and MOODLE are not popular but they slowly get attraction towards them because it is authentic platform for learning and teaching.

6. ADDIE is a most popular Information Design module among respondent rather than e-content development system most of the respondent not aware about any module for developing the e-content.

8. Conclusion

Today's Higher education model need to provide education to learners at any place, learners are now learning while earning for their life. The steps by government to provide courses through NPTEL/ SWAYAM also the E-content provide learner an opportunity to learn from any place through digital media. And Teachers also take positive initiative in this sense. So the present study also shows that teachers also develop good content.

9. Suggestion

1. UGC, HRDC gives instruction to colleges Institutions to make a separate budget for e content development.
2. Higher authorities give some proper guideline, knowledge of developing e-content in college Institute for beginners.
3. College, Institution provide separate space, infrastructure, internet for developing the e-content.
4. E-Content making is a time consuming process therefore count this time in self progression.
5. UGC, HRDC increase the workshops of e-content development.
6. UGC, HRDC need to spread more awareness about e-content.
7. Today's Educational policy make it compulsory to every staff.
8. Librarian should necessarily be a part of e-content development project in a college.
9. Every college Institute formulate the **E-content Development Committee**

and every teaching staff make at least two e-content as per their syllabus in a semester.

10. The education mode is already changed in various countries. Now, we have to add up this way to teaching and learning.
11. Give the training about uploading the e-content and its privacy.
12. All e-content kept in library as an institutional, college E-content repository.
13. UGC HRDC provider common hardware and software for developing the e-content.

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Developing Institutional Digital Repository using Open Source Software Dspace

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Abstract: The main aim of this paper to understand the basic concepts of Institutional digital Repository. This paper provides the information about the Hardware and software requirement for the installation of DSpace, further this paper also describe the step by step practical guideline to install and customize the Dspace digital library software.

1. Introduction

Now a days each and every institution and organization want to store their intellectual outputs and other related material in secure and easy retrieval form, So they can access their required documents in 24X7 hours from anywhere. There are many software developed for the easy storage and retrieval by the many organization and agencies such as Dpsace, E-Print Greenstone, Evergreen and many other. In which the following Dspace is a very popular and power full software. DSpace is an open sources and freely available software developed by MIT (Massachusetts Institute of Technology Libraries) and HP (Hewlett-Packard) in 2002, the latest version of DSpace was released in September 2017. Dspace is very popular among the academic and research institutions of India in the context of developing their digital library and Institutional digital repository. Threw Dspace we can developed our personal digital repository, so every one store their personal files and other long memorable material for long time.

2. Institutional Repository

An institutional repository is digital achieve of the intellectual output of any institute created by their Scientist, teachers and research scholars. Here Intellectual output means their research papers, thesis, dissertations, newsletters, institutional publications, meetings minutes, conference proceedings, pictures and other related materials in the digital form. So everyone can access and retrieve their institutional output in 24X7 hour from anywhere.

3. Definition of Institutional Repository

According to Raym Crow (2002)

"An institutional repository is a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end users both within and outside of the institution, with few if any barriers to access".

According to Bailey (2005)

"An institutional repository includes a variety of material produced by scholars from many units, such as e-prints, technical reports, theses and dissertation, data sets and teaching materials. Some institutional repositories are also being used as electronic presses, publishing e-books and e-journals".

4. About the Dspace

DSpace is an open sources and freely available Digital Library/Institutional digital repository software under the BSD (Berkeley Software Distribution). First version of DSpce was released in 2002 and developed by MIT (Massachusetts Institute of Technology Libraries) and HP (Hewlett-Packard). Since 2002 many other version of DSpace has been released with Latest features and strong metadata schema. The latest version of Dspace was released in September 2017 by DuraSpace. Dublin core metadata standard has been used in dspace for storage of item details.

5. Features of DSpace

1. Easy to operate and user friendly interface
2. Freely available digital library/ institutional repository open source software.
3. It can be customize according to their own requirement
4. It can store and retrieve all format of digital file, such as word, pdf, image and so on.
5. It support UTF-8
6. Strong searching for metadata and full text contents.
7. Compatable for Google scholar indexing.
8. Interface available in 22 languages.

6. Hardware and Software Requirements

Hardware Requirements

Hard Disk :- 500 GB to 1 TB
RAM :- 4 GB
Processor :- Intel core TM i-3517 UE
Scanner with high resolution
DVD Driver
High speed internet connection

Software Requirements

Operating system :- Any Linux version such as :- Ubuntu, Debian, Centos, Fedora

Java SDK
Apache Maven
Apache Ant
Apache Tomcat
Postgres SQL
Dspace

7. Steps for the developing Institutional Repository

Installation

There are two way for the installation of DSpace, first one threw command line with high speed internet and second one throw Live CD/DVD/USB.

If you are aware about the Linux Operating and their command, then it is easy to install dspace, it is lengthy and time consuming procedure but it is actual procedure.

If you are in the learning process then you can use Live CD/DVD/USB, for the installation of DSpace, it is easy procedure with easy steps and it will take little time.

Customization

Community/ Sub community / collection and items.

Before creating community, sub community, collection and items, we must understand these concepts. We are trying to understand these concepts with the help of simple example, suppose we are creating institutional repository for any

university, then the top level community of these IR can be any Faculty such as faculty of art, faculty of science and faculty of arts.

After the creating top level community we will create sub community.

Then sub-community of these IR can be any SOS or any Department such as SOS in Library and information science, SOS in economics and any other.

After the creation sub community, we will create collections.

The collection of these IR can be all digital material available in any SOS or Department, such as books, periodical. Thesis, dissertation, papers, conference proceeding or any other digital documents.

The items of these IR can be any particular books, periodical. Thesis, dissertation, papers, conference proceeding or any other documents.

How to create Community/ Sub community / collection and items :-

After the installation of DSpace the following window will display in front of us, we will click on the top right side menu of (Sign on to) of these window. (See figure 1)

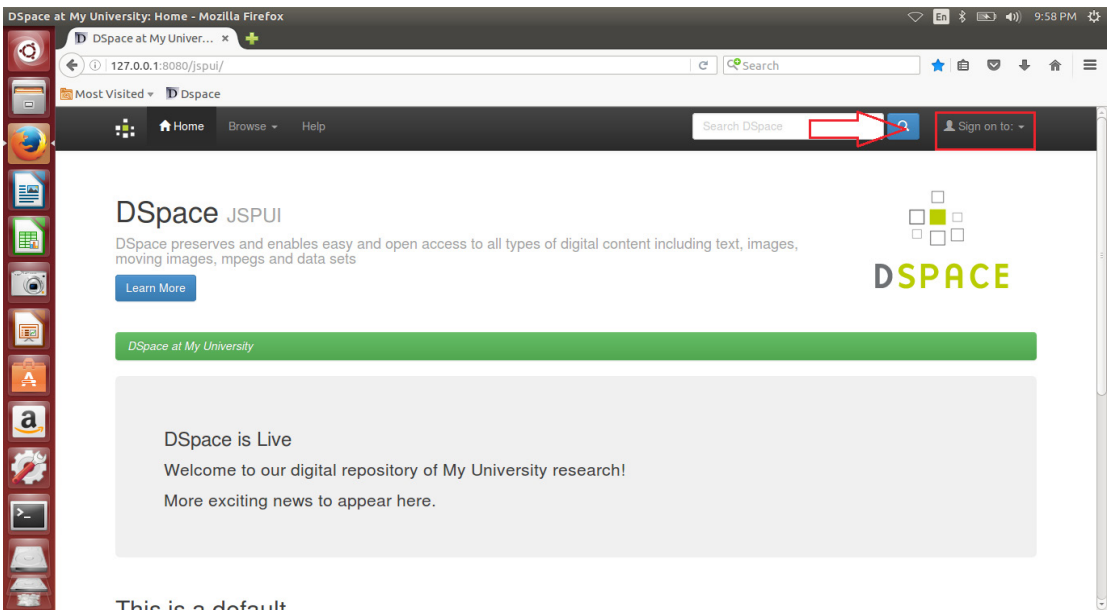


Figure 1

After that we click on My Dspace (See figure 2)

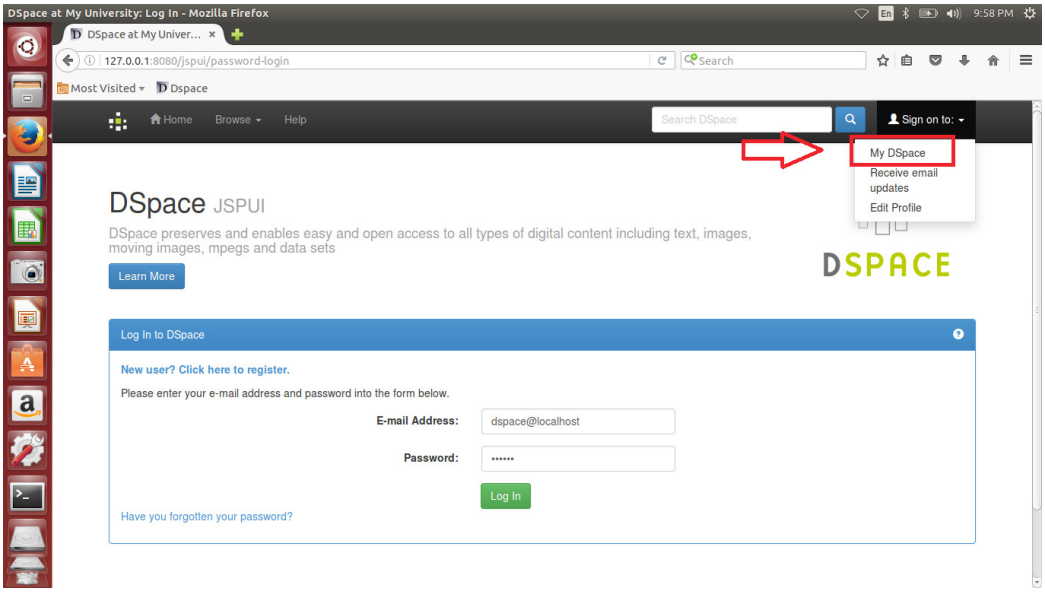


Figure 2

After the clicking on My DSpace the following window will display (See figure 3 We fill up the email and Password and then click on login.

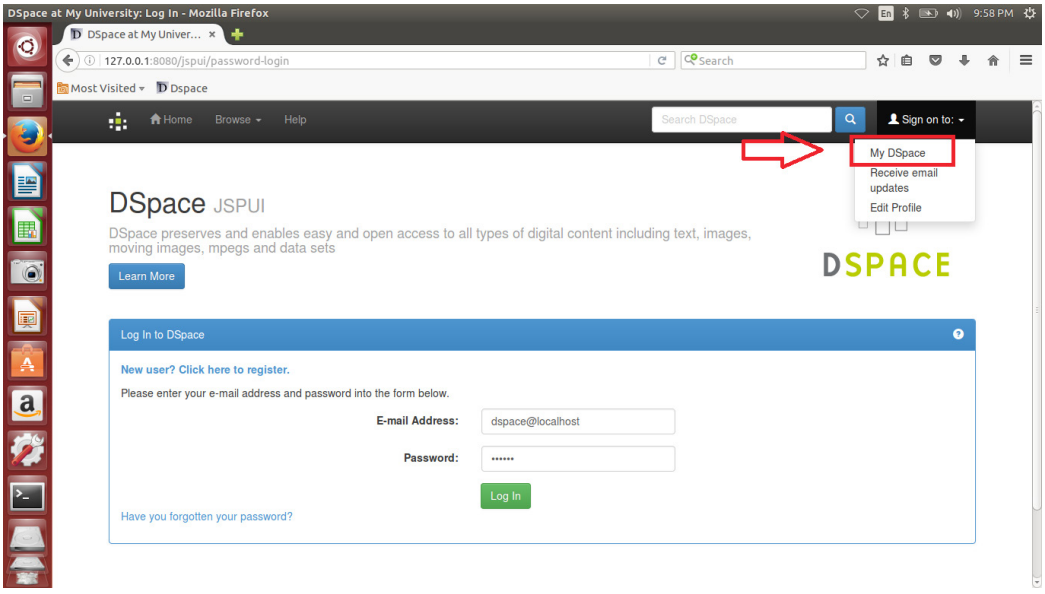


Figure 3

After the clicking on login, we click on browse and again click on community / collection. (See figure 4)

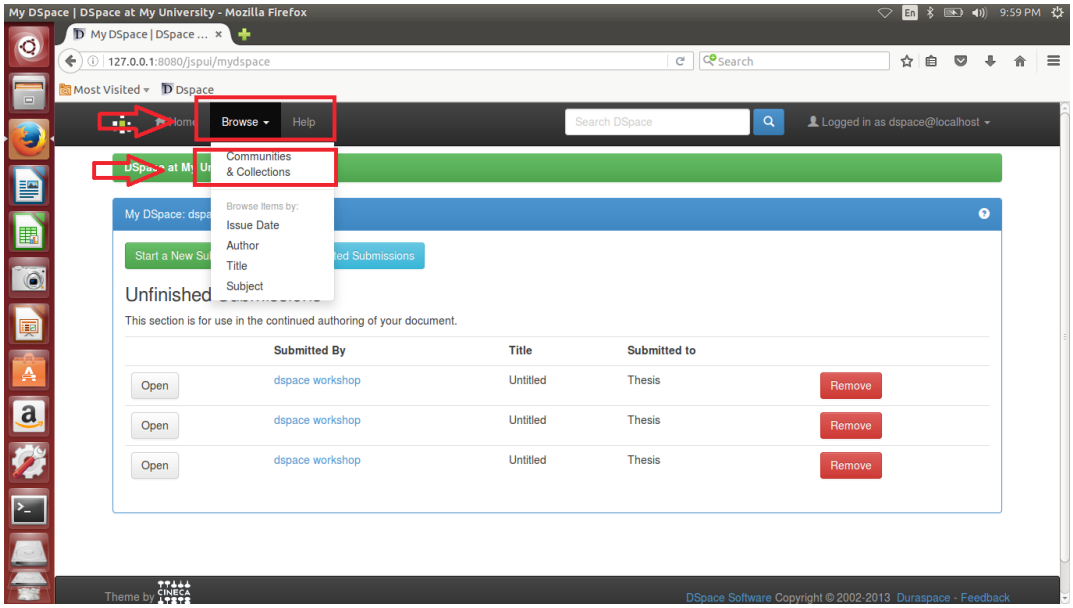
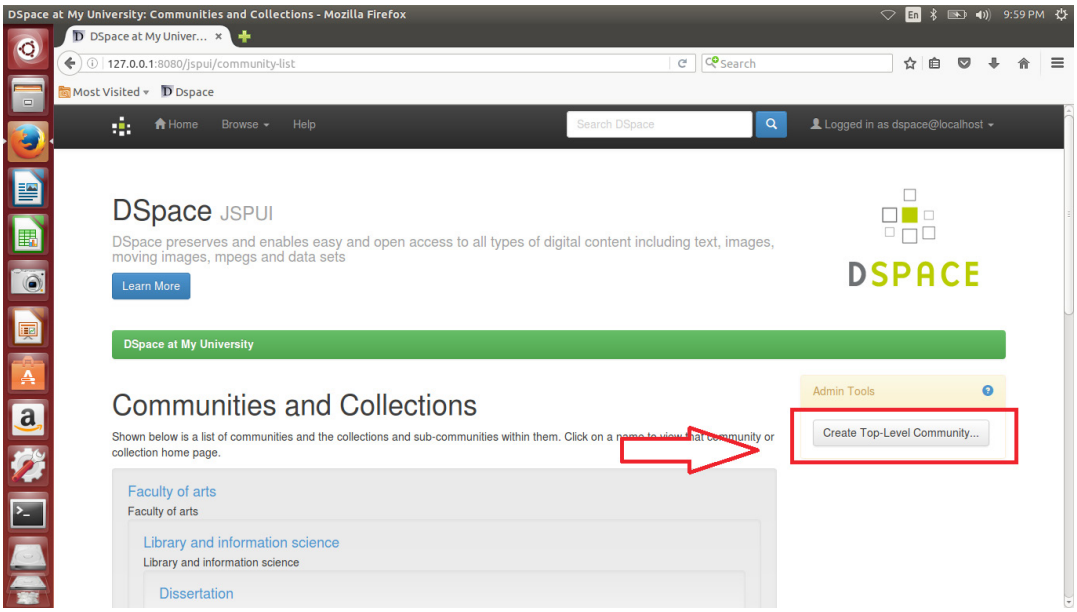


Figure 4

After the clicking on community / collection, the following window will display. (See figure 5)

After the filling following necessary information, our top level community will create.



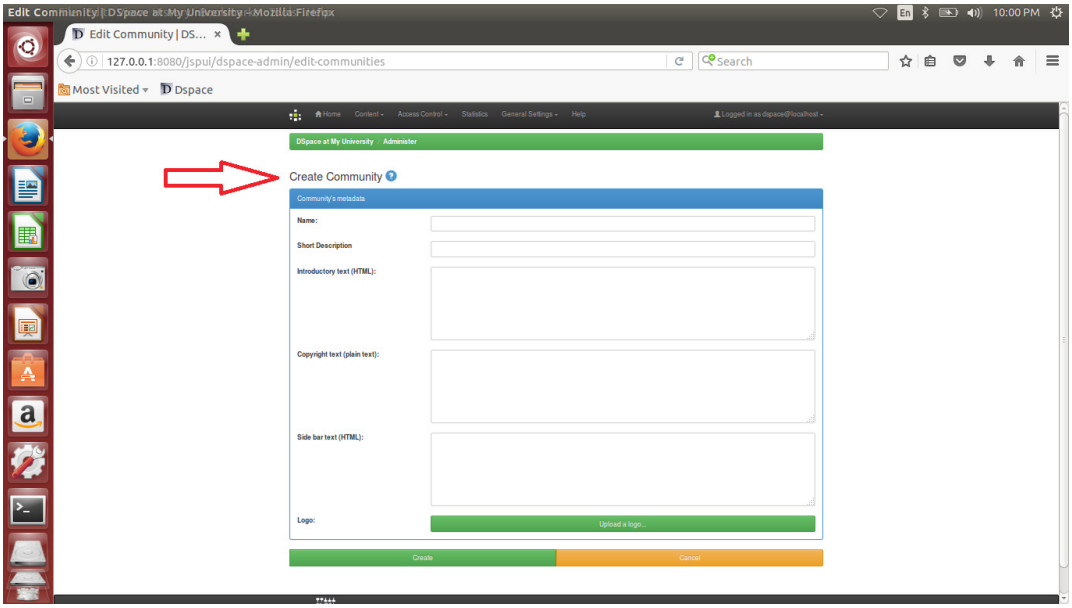


Figure 5

After the creating top level community we will click on create sub

Community and fill following necessary information, after the filling following necessary information our sub community will create. (See figure 6)

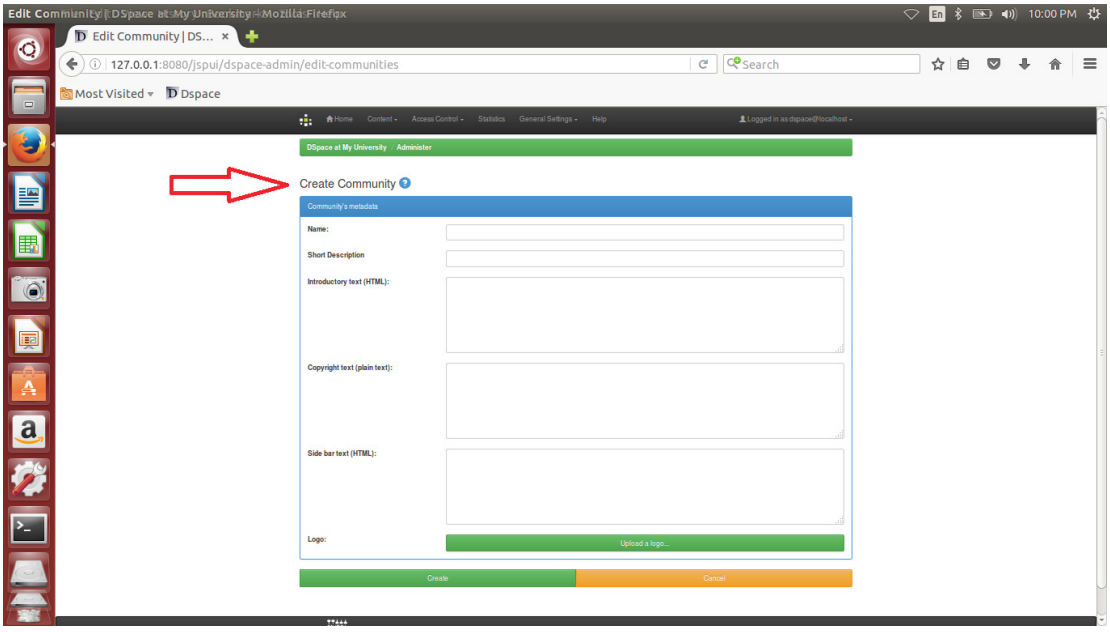


Figure 6

After the creating sub community, we will click on collection and fill following necessary information, after the filling following necessary information our collection will be create. (See figure 7 and 8)

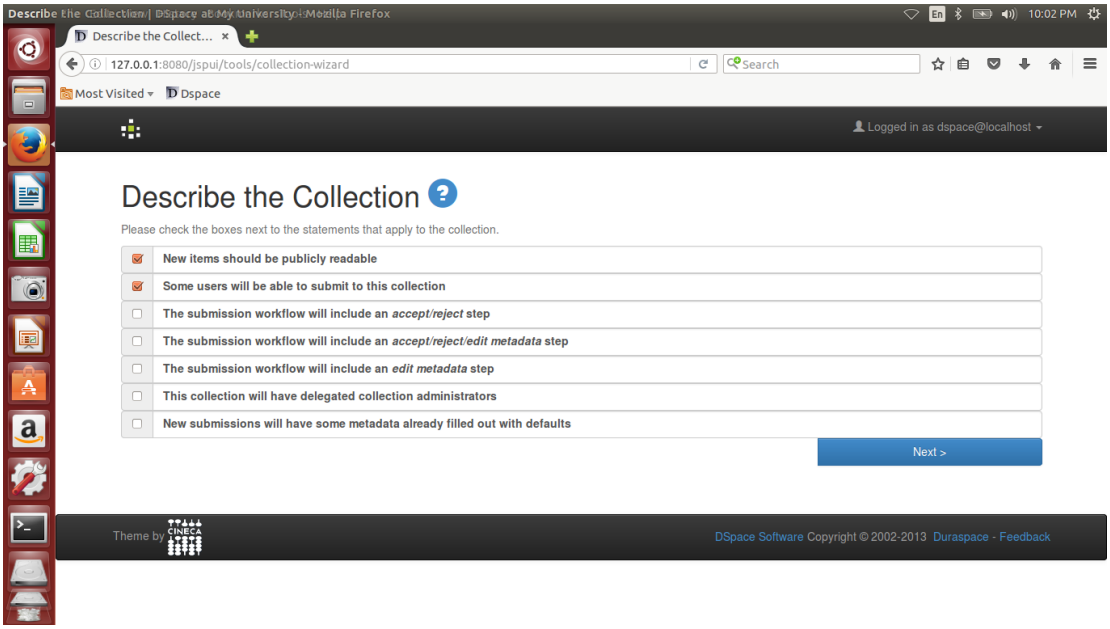


Figure7

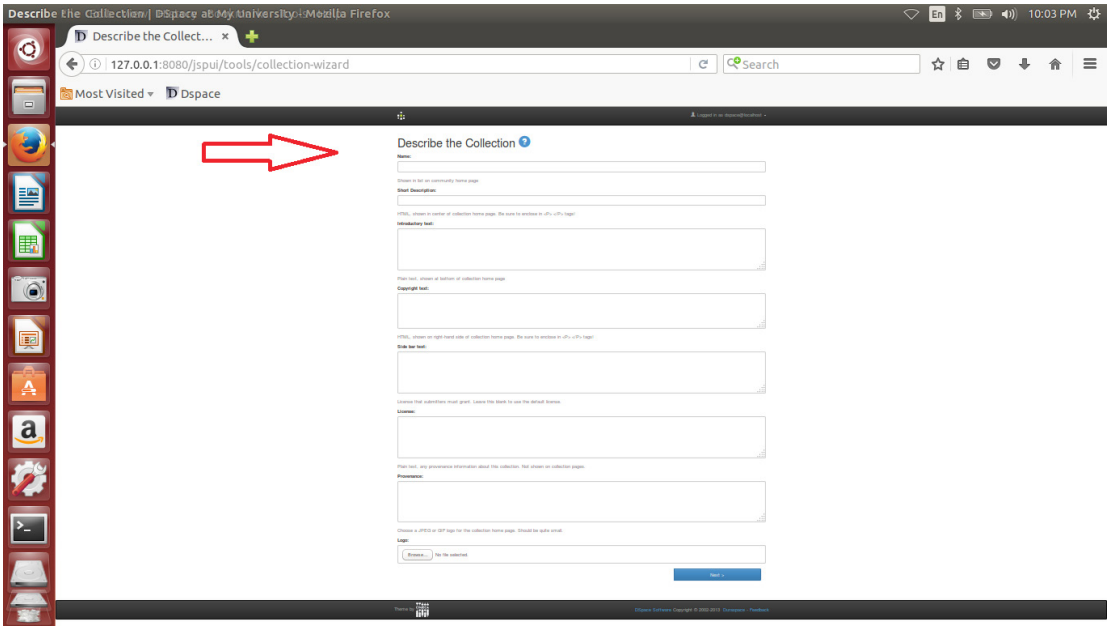


Figure 8

Upload Items

After the creating Community/ Sub community / collection we will able to upload any item in our Institutional Repository.

For the upload any digital material in Dspace we will have to completed six steps.

1. Describe
2. Describe
3. Upload
4. Verify
5. License
6. Complete

After the complete of these six steps, we will click on submission.

After the submission, our item will upload in our Institutional Repository.

Editing of uploaded items

Dspace also provide the facility to edit any already uploaded digital file. For the editing of already uploaded digital material in Dsapce, we will have to login with administration ID. After the login we can edit any items metadata. as well as we can also change the bit stream file and License content .

8. Problem, Issues and Challenges with successfully implementations of Institutional repository.

1. Lack of institutional or organizational effort
2. Lack of proper policy frame work.
3. Lack of technically skilled library professional.
4. Lack of essential infrastructure and sufficient fund
5. Copy right policy of publisher and its management
6. Awareness and attitude of scholars towards self archiving.
7. Scanning and editing of old print materials.
8. Lack of proper installation and customization manuals in the context of open source software.

9. Metadata Harvesting related issue.
10. Proper Embargo period related policy not available.

9. Conclusion

On the basis of above discussion we can say that, in present information communication technology era, if we want to full fill their target user information need in each and every context with 24X7 hour, then we must implement their own institutional repository and publish their intellectual output. For the successful implementation institutional repository, we must form proper policy framework and implement their IR step by step.

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A Case Study on Open Source Application can Breach Library Security

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Abstract: The open source movement creates a new paradigm in the library and information science community. This paper tried to find out how open source software can breach library security but before going deeper into the topic let's have a short study on what is Open Source Software, why we prefer to use it, the advantages and disadvantages of it, and what are the major differences between Closed Source Software with it. We can't ignore the advantages of Open Source Software because the most significant option with Open-Source Software is that its source code is open but it also a problem with it, it creates a vulnerability, which can affect on data of the library, and not only that, it can be harmful for the parent organization also. Several of these vulnerabilities in open-source software could potentially expose an institution to threats such as injections of malware, data breaches, and Denial-of- Service (DoS) attacks. In average cases, vulnerabilities will go undetected for over four years. Data leakage, unauthorized access, and other security bugs are there in open-source software. OPAC is one of the most significant or related part in Library Security. Before using open-source software in a Library we should assess the risk.

Keywords: Open Source Software (OSS), Data breaches, Library Security, Vulnerabilities, Security Bugs.

1. Introduction

Open Source Software project managers frequently neglect or disregard major preventive maintenance activities, including security scans for library vulnerabilities, even with automatic library updates. Neglecting such scanning tasks can impact both the both client-side and server-side of the software. "Using Components with Known Vulnerabilities" was listed among the top ten application security risks in 2017 as per A9:2017 in OWASP Top Ten 2017.

Bug bounty programs can incentivize security disclosures but have not taken hold as a standard policy. The National Institute of Standards and Technology is constructing a new process for receiving, analyzing, and responding to vulnerability disclosures, providing at least a guideline for open source projects to establish their own policies. Such vulnerability disclosure policies are growing in importance due to the continued increase of information breaches.

2. Advantages of Open Source Software

- Four Essential Freedoms: Richard Stallman's Free Software Definition was adopted by the Free Software Foundation (FSF) and it provides the Four Essential Freedoms for Free and Open Source Software (FOSS).

These four freedoms are as follows:

Freedom 0- Freedom to run the software for any reason, as your wish. Freedom 1- Freedom to change the source code as per your wish.

Freedom 2- Freedom to redistribute the copies of it without any limitation. Freedom 3- Freedom to modify and release modified version in public.

- Availability of External Support: Support for open source is usually available publicly and can be accessed easily via online communities. There are several tech firms' offers basic online assistance and different levels of paid help too. Maintenance and support are also offered by most organizations that develop open source software solutions.
- Cost Effective: It will help you to reduce your costs by using open source software because there is no cost for license of the software.
- Escape vendor lock-in: Their will no particular vendor lock in for period of time in open source software.

Disadvantages of Open Source Software

- Quality Support System: Two kinds of supports are available for OSS. One is through free online open source support community but here you won't get any personalized support, members may have difficulties to understand the codes and secondly many tech companies provide paid support system.
- Hidden Cost: In particular, if you have not considered hidden costs from the beginning, software that is free upfront but later costs money to run can be a big burden.
- Security Threats & Vulnerabilities - Publicly revealing the source code and making it available to anyone will lead the program to be vulnerable. It's not like all users have the intention to support the software, many would

like to damage identity theft, virus transfers, and other harmful practices to the software.

- Technically sound expert: To use and run this kind of software seamlessly you need to technically sound experts to handle it.

Major Difference Between Open Source and Closed Source Software

Open Source Software	Closed Source Software
1. Source code is open for general public use.	Source code of the software is closed for public use.
2. User can modify, redistribute the source code.	Only the vendor software developer can modify the source code.
3. Not much user friendly.	Comparatively more user friendly
4. Need public collaboration to fix the bug.	Developers put the eye on the security of the software always, if any bug find out they work on it to fix the bug.
5. Support system is not up to the mark.	Very good support system if any problem arises.
6. Vast area of solution can be covered.	Target area of solution can be covered.
7. Updates/Road map are not mentioned.	Updates/Road map are mentioned.
8. License & Support is mostly Free.	License & Support always chargeable.

How this study had found out Security Bugs in Open Source Software

I had installed an Open Source Library Management Software namely Koha in a Linode VPS (Virtual Private Server). After installation Linode Support Team stopped my VPS & shares some information for me, that was really surprising.

The Report Shows that

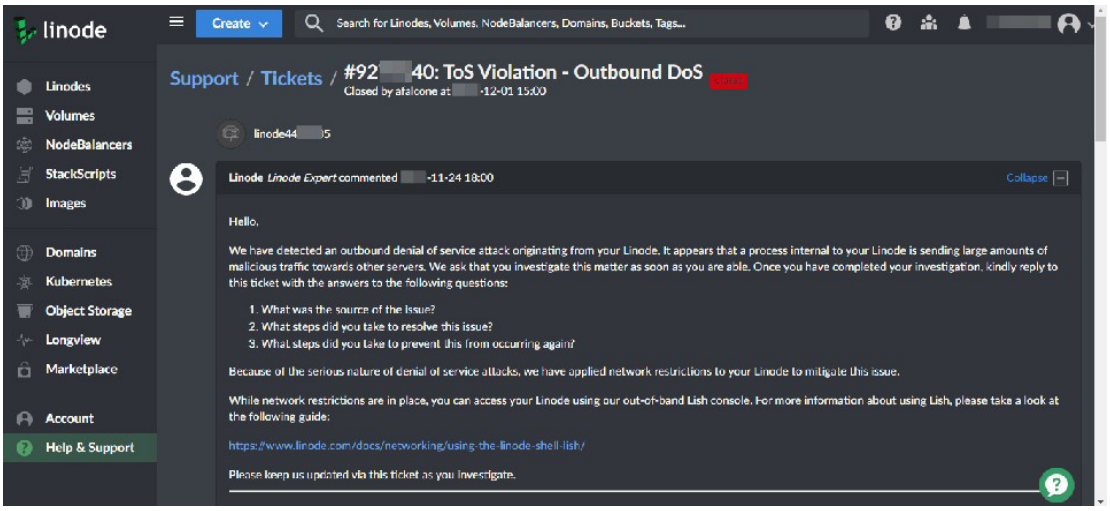
As per the report: An outbound denial of service attack originating from this Linode was being detected. A process internal to this Linode sends huge amounts of malicious traffic to other servers. They were asking me to investigate this matter as soon as I can.

The Important Topics Asked by them are below,

a) Reason of this issue.

b) How we can resolve this issue.

c) How I had taken action to avoid this from happening again.



Screenshot of Linode Support Ticket

Note: Because of the serious nature of denial of service attacks, they had applied network restrictions to my Linode to mitigate this issue.

Security Bugs are how significant or related to Library Security:

Many studies shows that how vulnerable is OSS.

"The management of open source libraries poses a major challenge for secure development. That's because seven in 10 applications use at least one flawed open source library, inheriting vulnerabilities that could potentially be exploited, according to a new study of more than 81,000 applications."

Application security firm Veracode found out that "the vulnerability of open source libraries varies across languages and frameworks, and developers should take into consideration the characteristics of the framework they are working with, according to Veracode, which published the analysis. PHP applications, for example, have a modest number of imported open source components — an average of 34 — but a larger share of vulnerable libraries. On the other hand, while JavaScript typically has a relatively low number of vulnerable libraries, the typical application has a massive number of imported libraries — 377 on average — resulting in a large number of vulnerabilities."

According to WhiteSource study the figures for "Open source vulnerability per year , in 2015 and 2016 the number of security bugs didn't exceed 1,500 a year, but in 2017 and 2018 the number blew up to over 4,000 per year. WhiteSource has discovered that 85% of open-source bugs are exposed and

are already available with a fix. It mentions that some users are not aware of these fixes because only 84% of identified open source vulnerabilities, bugs are included in the National Vulnerability Database (NVD). Vulnerability information is not reported in one centralized location, instead scattered across hundreds of resources, and quite often inappropriately indexed, therefore making it difficult to search for specific data".

OPAC & Security Bug Relation

Online Public Access Catalog is more venerable then other part of a Open Source Library Management Software because user can access this part from intranet & internet also. A basic level of security bug can breach library confidential information & not only that the parent organization information also as we discussed above.

Recommendations & Conclusion

Remove redundant dependencies, unwanted functions, data, documents, and components from OSS. Continuously inventory the versions of both client-side and server-side components (e.g. frameworks, libraries) and their dependencies using tools like versions, DependencyCheck, retire.js, etc. Continuously monitor sources like CVE and NVD for vulnerabilities in the components. Use software composition analysis tools to automate the process. Subscribe to email alerts for security vulnerabilities related to components you use. Only obtain components from official sources over secure links. Prefer signed packages to reduce the chance of including a modified, malicious component. Monitor for libraries and components that are unmaintained or do not create security patches for older versions. If patching is not possible, consider deploying a virtual patch to monitor, detect, or protect against the discovered issue. before use a OSS Ask Yourself, is it harmful? or Decide Yourself useful? Choice is Yours'

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Web Content and Design Trends of Deemed Agricultural Universities Library Website of India: An Evaluation

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Abstract: The Deemed Agriculture University Library Website is one of the most important tools to publish and disseminate the information of several activities such as library notice, mission vision, rules and regulations, library facilities, new arrival, e-resources, and services, etc. The present study is based on the information available on the Deemed Agriculture University Library Websites/Webpage of India. A checklist method was used for content evaluation based on an earlier study conducted by different experts on this respective topic. The findings result of the study showed that the ICAR-National Dairy Research Institute, Karnal scored 34 out of 52 (65.38%), which secured first ranked and comes under the "Good" grade point whereas ICAR-Central Institute on Fisheries Education, Mumbai Library Website/Webpage holds ranked in 4th position with "Needs Improvement" grade point to make available the basic library services as per their requirement by scoring 12 out of 52 (23.07%) features.

Keywords: Content Analysis, Website Evaluation, Deemed Agricultural Universities, India, Web Contents

1. INTRODUCTION

In this digital era, the library website is considered one of the most imperative tools to attract users. Every institute has developed its website and is used for imparting valuable recent information put together to the targeted users in one single umbrella. In every academic institute, the library is recognized as a knowledge resource center and sometimes known as Information Resource Centre where its users catch up on information as per their requirements. As per the information needs of the readers, libraries are shifting new shapes and methods in which libraries are transforming from traditional libraries' journey to digital-libraries, virtual-libraries, mobile-libraries, Green Library, and cloud-based libraries. In the traditional library system, existing offline/printed information within libraries is converting into online/virtual information i.e.; imparting through several resources and accessible on a 24x7 platform and in different formats. These days, users can do ask reference questions online, Inter-Library Loan requests through online, find academic journals, thesis, books electronically,

and perform research in databases. The library website is a window and showcase of every institute to get the information in one single platform. Itis promoting the library services to online users as well as they can access and use the availability of library e-resources without physically visiting the library.

In this digital age, agriculture information has become one of the most important roles playing for the development of the agricultural sector. Agriculture universities, colleges, and research institutes have been playing a vital role in teaching, research and extension, and also library activities. Librarians act as a mediator role to disseminate valuable information to voracious readers. The agriculture libraries have dedicatedly served the nation since the initiation of agriculture universities and institutes. At present, there are 63 State Agriculture Universities (SAUs), 03 Central University, 04 Deemed Universities, and 64 ICAR Central Research Institutes, 06 National Bureaux, 13 Directorates/Project Directorates, and 15 National Research Centres in India offering education and research facilities for the development of agriculture in India.

2. Related Research Work

There are many studies conducted worldwide in this area but no study was found particularly on content analysis of Deemed Agricultural Universities Library Websites/Webpages. Keeping consistency with the topic of the study, only those kinds of literature are reviewed which were found relevant to Indian Agriculture University contributed by different experts.

M & Raval (2019) evaluated the content of the Agricultural University Sciences Library Website in Gujarat State with the help of the checklist method for data collection. Finding result showed that that NAU and KU have not integrated on Social Networking Site on their website whereas SADU has YouTube, Facebook, Twitter, LinkedIn, Google +, Instagram, and Pinterest. Further, it was revealed that AAU and KU offer Library OPAC facility through Koha Software. The Author suggested and recommended that the library website must increase its online services to reach needy users.

Swapna & Francis (2014) evaluated the content of six premier Agricultural Universities in South India namely, Acharya N.G. Ranga Agricultural University, Kerala Agricultural University, Thrissur, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu Veterinary and Animal Sciences University, Chennai, University of Agricultural Sciences, Dharwad, and University of Agricultural Sciences, Bangalore. The author recommended that Library Science School must include in the course curriculum with an emphasis on state-of-the-art content

management methods and continuing education programmes for working professionals should organise time to time.

Tiwari & Pandit (2014) analyzed the content of the Maharashtra State Agricultural Universities Library Website for the update, accurate, useful information about their collection and services with the help of the checklist method. It was observed that all four agricultural university libraries did not have a separate library website.

Patel & Patel (2013) examined the content of the Agricultural University Libraries website of Gujarat State. It was revealed that the majority of the library has not mentioned library rules and committee details on their webpage. Further, it was observed that all four libraries have not provided information about book bank services. These services are very valuable to students. It is recommended to facilitate the mentioned services.

Kothainayaki & Gopalakrishnan (2011) examined 54 Agricultural Universities, 1 Central University, 5 Deemed Universities which includes 44 State Agricultural Universities (SAUs), and 4 Central Universities with agriculture faculty were considered to study. It was observed from the study that Govind Ballabh Pant University of Agriculture & Technology, Sam Higginbottom Institute of Agriculture, Technology & Sciences (Formerly Allahabad Agricultural Institute) secures a position in the top 10 universities in Alexa Traffic Rank and Google PageRank. The author emphasised that webmasters must seek out and link possible websites so that can harmonize the resources available in their institutions.

3. Scope of the Study

The content presentation of the Deemed Agriculture University Library website/ webpage plays a very significant role to increase visibility and making it more attractive, informative to the information seeker. The content of Deemed Agricultural University Library Websites/webpages can be denoted in different forms, the most common and available being text, image, and graphics. The study is confined to evaluate the content of four Deemed Agriculture University Library Websites in India namely- ICAR-Indian Agricultural Research Institute, New Delhi, ICAR-National Dairy Research Institute, Karnal, ICAR-Indian Veterinary Research Institute, Izatnagar, and ICAR-Central Institute on Fisheries Education, Mumbai. Thus, the present study is limited to only these four University Library Websites as listed in Table-1.

Table 1: List of Deemed Agriculture University Websites of India

Sl. No.	Name of the Deemed Agriculture University	URL	Library Website URL
1	ICAR-Indian Agricultural Research Institute, New Delhi	https://www.iari.res.in/	http://library.iari.res.in/ or https://www.iari.res.in/index.php?option=com_content&view=article&id=221&Itemid=996
2	ICAR-National Dairy Research Institute, Karnal	http://www.ndri.res.in/ndri/Design/Index.html	http://www.ndri.res.in/ndri/Design/library.html
3	ICAR-Indian Veterinary Research Institute, Izatnagar	http://www.ivri.nic.in/	http://www.ivri.nic.in/Division/cenfc/nlvs/default.aspx
4	ICAR-Central Institute on Fisheries Education, Mumbai	https://www.cife.edu.in/	https://www.cife.edu.in/library.html

(Source: https://www.icar.org.in/content/deemed-universities)

4. RESEARCH OBJECTIVES

The present study is carried out to undertake the following objectives.

1) To examine the status of library-related information, e-resources, services, and other facilities existing on the Deemed Agriculture University Library Websites/Webpage;
2) To examine whether the Deemed Agriculture University Library Websites/Webpage makes mobile-friendly website/webpage for searching information through Mobile;
3) To determine whether the Deemed Agriculture University Library has a separate website/webpage;

4) To find out the direct link on parents' home page or link under academics, infrastructure, facilities, etc in Library website/webpage;
5) To examine the Web 2.0 Tools that have been deployed by Deemed Agriculture University's revealed on their library websites/webpages.

5. RESEARCH METHODOLOGY

The study is mainly based on a webpage survey and observation method which is used for data collection to meet the fulfillment of research work. The entire research work was designed and developed with the help of a well structure checklist method earlier verified and used by different experts updated as per current literature. Fifty-two criteria were used based on previous studies to collect research data from the respective library website. Collected data denoted the **Tick Mark** as "✓" for **Available** (01), **Cross Sign** as "X" for **Not Available** as (0) to each feature available in the library website under the present study. It makes it easy to do analysing statistical techniques, tables and figures have been used for clarity and simplicity.

A four-point rating scale was fixed equally based on the maximum score of 52 of Content features (Table 6 to 9 with 52 points) to rank the Deemed Agriculture University Library Websites/Webpages, the rating scale was considered to rank "Very Good" to "Needs Improvement" based on the four-point scale below:

Rating Scale for Deemed Agriculture University Library Websites/Webpages

Range (Score)	Rank
40-52	Very Good
27-39	Good
14-26	Average
01-13	Needs Improvement

6. Data Analysis and Interpretation

The collected data were presented and tabularized by using MS Excel 2010. The collected data were subsequently analyzed and interpreted with the help of the checklist method were followed for the study.

Classification by URL Extension of Deemed Agriculture University Websites

Table 2 denoted the several URL extensions used by Deemed Agriculture University

Websites for their Library Website/Webpage. 2 (50%) of ICAR-Indian Agricultural Research Institute, New Delhi and ICAR-National Dairy Research Institute, Karnal Websites used URL extension as res.in where only 1 (25%) ICAR-Indian Veterinary Research Institute, Izatnagar and ICAR-Central Institute on Fisheries Education, Mumbai has nic.in and edu.in for their respective Library Website/Web Page.

Table 2: Classification by URL Extension of Agriculture University Websites/ Webpages

Name of the Agriculture University	URL extension
ICAR-Indian Agricultural Research Institute, New Delhi	res.in/
ICAR-National Dairy Research Institute, Karnal	res.in/
ICAR-Indian Veterinary Research Institute, Izatnagar	nic.in/
ICAR-Central Institute on Fisheries Education, Mumbai	edu.in/

Availability of Deemed Agriculture University Library Websites/Webpages

Table 3 shows the detailed information about the availability of the libraries' website/web page of Deemed Agriculture University Library Websites/Webpages respectively. The researcher has organized two parameters, namely., the library has a website/webpage and the library has a separate website under the heading of the availability of libraries' website/web page. It is revealed that 4 (100%) of the Deemed Agriculture University Library has a website/webpages and only ICAR-Indian Agricultural Research Institute, New Delhi has a separate portal/ website with 25%.

Table 3: Availability of Deemed Agriculture University Library Websites/ Webpages

Name of Agriculture University	The library has a website/ webpage	The library has a separate website
ICAR-Indian Agricultural Research Institute, New Delhi	✓	✓
ICAR-National Dairy Research Institute, Karnal	✓	**X**
ICAR-Indian Veterinary Research Institute, Izatnagar	✓	**X**

Name of Agriculture University	The library has a website/ webpage	The library has a separate website
ICAR-Central Institute on Fisheries Education, Mumbai	✓	**X**
Total Score (Max. 4)	**4 (100%)**	**1 (25%)**

Accessibility of Deemed Agriculture University Library Websites/Webpages

Table 4 shows the accessibility of the libraries' website/web page of the Deemed Agriculture University Websites. The link of the library website/web page must be provided directly on the parent's home page so that the readers can be accessed without any difficulty for everyone. If any library website is not given a direct link then anyone has to hunt for under each heading/category for getting their chosen link to the web page/website. The analysis of the study reveals that 3 (75%) of Deemed Agriculture University Library Websites/Webpages has a direct link on parents' home page which is followed by 1 (25%) of the Deemed Agriculture University Library Websites/Webpages has a link under academics, infrastructure, facilities, etc.

Table 4: Accessibility of Deemed Agriculture University Library Websites/ Webpages

Name of Agriculture University	Direct link on parents' home page	Link under Academics, Infrastructure, Facilities, etc.
ICAR-Indian Agricultural Research Institute, New Delhi	X	✓
ICAR-National Dairy Research Institute, Karnal	✓	X
ICAR-Indian Veterinary Research Institute, Izatnagar	✓	X
ICAR-Central Institute on Fisheries Education, Mumbai	✓	X
Total Score (Max. 4)	**3 (75%)**	**1 (25%)**

Basic Information on Mobile-Friendly Test

Mobile-Friendly Test is a mechanism where anybody can test a particular website to see whether it is mobile-friendly or not. As per study concern, the

researcher adopted the Mobile-Friendly Test of Google Search Console (https://search.google.com/test/mobile-friendly). It is very simple and easy to paste the URL of the respective website into the shown space provided area, then click test URL within a few seconds, the result will be shown. It is observed that all the Deemed Agriculture University Library Websites/Webpages are user-friendly to visit the websites/webpages.

Table 5: Accessibility and Mobile-Friendly Test

Name of Agriculture University	Mobile-Friendly Test
ICAR-Indian Agricultural Research Institute, New Delhi	✓
ICAR-National Dairy Research Institute, Karnal	✓
ICAR-Indian Veterinary Research Institute, Izatnagar	✓
ICAR-Central Institute on Fisheries Education, Mumbai	✓
Total Score (Max. 4)	4 (100%)

General Information

Table 6 revealed that all the Deemed Agriculture University Library Websites/Webpages under the study were provided information about the library, library opening hours/working hours/ timings/holidays, and contact us with 100%. 75% (03) of the Deemed Agriculture University Library Websites/Webpages stated the information about images/photo gallery, which was followed by 02 (50%) Deemed Agriculture University Library Websites/Webpages given information about library rules and regulations, library membership details, domain, copyright and library staff/team. Only 01 (25%) of the Deemed Agriculture University Library Website/Webpage have provided information about the library advisory committee, library sections, and library achievements.

Table 6: Basic Information available on Deemed Agriculture University Library Websites/Webpages

General Information/ Criteria	01	02	03	04	Total	%
About Library	✓	✓	✓	✓	**4**	100%
Library Opening Hours/ Working Hours/ Timings/ Holidays	✓	✓	✓	✓	**4**	**100%**
Contact Us	✓	✓	✓	✓	**4**	**100%**
Images/Photo Gallery	✓	✓	✓	X	**3**	**75%**

General Information/ Criteria	01	02	03	04	Total	%
Library Rules and Regulations	X	✓	X	✓	**2**	**50%**
Library Membership Details	X	✓	X	✓	**2**	**50%**
Domain	✓	✓	X	X	**2**	**50%**
Copyright	✓	X	X	✓	**2**	**50%**
Library Staff/Team	X	✓	✓	X	**2**	**50%**
Library Advisory Committee	X	✓	X	X	**1**	**25%**
Library Sections	X	✓	X	X	**1**	**25%**
Library Achievements	X	X	✓	X	**1**	**25%**
Total Score (Max. 12)	**6 (50%)**	10 (83.33%)	6 (50%)	6 (50%)		

Note: *ICAR-Indian Agricultural Research Institute, New Delhi (01), ICAR-National Dairy Research Institute, Karnal (02), ICAR-Indian Veterinary Research Institute, Izatnagar (03), ICAR-Central Institute on Fisheries Education, Mumbai (4)*

Information about Library Collection

The library collection is a significant part of any library to make available information regarding different types of various resources viz., books, journals, audio-visual materials, reference sources/books, CDs, DVDs, general magazines/ periodical and new arrivals of books and journals which has easy access through the website. The availability of information about library collection on the websites/webpages of respective Deemed Agriculture University Library and the data is presented in Table 7. The analysis of the study reveals that the majority (100%) of the Deemed Agriculture University Library Websites/Webpages have revealed the information about printed books and printed journal collection which was followed by the information about the general magazines/periodical and back/bound volume of journals with 75%. It was further observed that 2 (50%) of the Deemed Agriculture University Library Websites/Webpages make available detailed information about CDs/DVDs/CD ROM, reports, reference sources/books, monographs. Only 01 of the Deemed Agriculture University Library Websites/Webpages with 25% has given information about the seminar/ conference proceedings, list of print journals, microfilms, and ongoing projects.

Table 7: Information about Library Collection

Library Collection	01	02	03	04	Total	%
Printed Books	✓	✓	✓	✓	**4**	**100%**
Printed Journals	✓	✓	✓	✓	**4**	**100%**
General Magazines/ Periodical	✓	✓	✓	X	**3**	**75%**
Back/Bound Volume of Journals	X	✓	✓	✓	**3**	**75%**
CD/DVDs/CD ROM	✓	✓	X	X	**2**	**50%**
Reports	✓	X	✓	X	**2**	**50%**
Reference Sources/ Books	✓	✓	X	X	**2**	**50%**
Monographs	✓	X	✓	X	**2**	**50%**
Seminar/Conference Proceedings	✓	X	X	X	**1**	**25%**
List of Print Journals	X	X	X	✓	1	**25%**
Microfilms	X	✓	X	X	**1**	**25%**
Ongoing Projects	✓	X	X	X	**1**	**25%**
Total Score (Max. 12)	**9 (75%)**	**7 (58.33%)**	**6 (50%)**	**4 (33.33%)**		

Information about Library Services

The Deemed Agriculture University Library Website/Webpage pivotal role in providing information on different library services viz., CD-ROM Search, internet surfing facility, photocopying, CAS, Inter-Library Loan, etc. Good and the best services helps the library to attract its users towards the information and the library. Similarly, Table 8 represents the library services provided on the Deemed Agriculture University Library Website/Webpages. It is observed from the study that the majority (100%) of the Deemed Agriculture University Library Website/ Webpage has given information on the library website about the OPAC facility, Resource Sharing (CeRA), ILL/DDS. Only 3 (75%) of the Deemed Agriculture University Library Website/Webpage has provided information about internet surfing facility. It is further observed from the study that 50% of the Deemed Agriculture University Library Website/Webpage (02) has given information about reference/information service, CD Service (CD-ROM Search), reprographic service, and reading room facilities, etc. Only 1 (25%) of the Deemed Agriculture

University Library Website/Webpage provides the information of database access/ database search/database service, circulation service/functions, literature search services, bibliography and abstracting services, documentation services, and user guidance services, etc.

Table 8: Information about Library Services

Library Services	01	02	03	04	Total	%
OPAC Facilities	✓	✓	✓	✓	4	100%
Resource Sharing (CeRA)	✓	✓	✓	✓	4	100%
ILL/DDS	✓	✓	✓	✓	4	100%
Internet Surfing Facility	✓	✓	✓	X	3	75%
Reference/Information Service	✓	X	✓	X	2	50%
CD Service (CD-ROM Search)	✓	✓	X	X	2	50%
ReprographicService	X	✓	✓	X	2	50%
Reading RoomsFacilities	✓	X	✓	X	2	50%
Library and Information Science Course for PG and Ph.D. Students	X	X	✓	✓	2	50%
Library Display/ New Arrivals Display	✓	✓	X	X	2	50%
CCTV Camera	X	✓	✓	X	2	50%
Loan Privileges/ Lending Service	X	✓	✓	X	2	50%
Wi-Fi Facility	✓	X	✓	X	2	50%
Reading Services	✓	X	✓	X	2	50%
Circulation Service/ Functions	✓	X	X	X	1	25%
Library Services	**01**	**02**	**03**	**04**	**Total**	**%**
CAS	X	✓	X	X	1	25%
Database Access/ Database Search/ Database Service	X	✓	X	X	1	25%
Literature Search Services	X	✓	X	X	1	25%
Bibliography and Abstracting Services	X	✓	X	X	1	25%

Documentation Services	X	✓	X	X	1	25%
User Guidance Services	X	X	✓	X	1	25%
Book Borrowing Facility	X	✓	X	X	1	25%
News Paper Clippings	X	✓	X	X	1	25%
Total Score (Max. 23)	11 (47.82%)	16 (69.56%)	13 (56.52%)	4 (17.39%)		

E-Resources Information on Deemed Agriculture University Library Website/ Webpage

Library website makes available information about e-resources including-books, E-databases, E-journals, links to consortium like CeRA, back volumes of the journals, etc. to the users so that the readers get access easily these E-Resources at their fingertips without hunting time as per S.R Ranganathan (Save the time of the Reader) five laws of library science. E-resources are the most demanding sources at present where the users can access the information of their interest from anywhere and at any time. Table 9 shows the availability of different E-Resources provided for the users by the Deemed Agriculture University which is further reflected in their respective libraries' websites. The present study reveals that the majority 4 of the Deemed Agriculture University Library Website/Webpages subscribed to E-Journals with 100%, which is followed by the information about the availability of e-books by 03 (75%) Deemed Agriculture University Library Website/Webpages. Only 01 Deemed Agriculture University Library Website/ Webpages has given information on the library website.

Table 9: E-Resources Information on Deemed Agriculture University Library Website/Webpage

E-resources	01	02	03	04	Total	%
E-Books	✓	X	✓	✓	**3**	**75%**
E-Journals	✓	✓	✓	✓	**4**	**100%**
E-Database/Online Database	✓	X	X	X	**1**	**25%**
E-Newspaper	✓	X	X	X	**1**	**25%**
CD-ROMDatabase	✓	X	X	X	**1**	**25%**
Total Score (Max. 5)	**5 (100%)**	**1 (20%)**	2 (40%%)	2 (40%)		

Total Score and Ranking of Deemed Agriculture University Library Websites/Webpages

The total score of study Deemed Agriculture University Library Websites/ Webpages is presented in Table 10 based on previous respective Tables 6 to 9 entitled "Total Score and Ranking of Deemed Agriculture University Library Websites/Webpages".

Table 10: Total Score and Ranking of Deemed Agriculture University Library Websites/Webpages

Name of the University	T 6 (Max. 12)	T 7 (Max. 12)	T 8 (Max. 23)	T 9 (Max. 5)	Total Score (Max. 52)	Grade	Rank
ICAR-National Dairy Research Institute, Karnal	10	7	16	1	34	Good	1st
ICAR-Indian Agricultural Research Institute, New Delhi	6	9	11	5	31	Good	2nd
ICAR-Indian Veterinary Research Institute, Izatnagar	6	6	13	2	27	Good	3rd
ICAR-Central Institute on Fisheries Education, Mumbai	6	4	4	2	12	Needs Improvement	4th

It was observed from the study that based on the total score obtained by ICAR-National Dairy Research Institute, Karnal, ICAR-Indian Agricultural Research Institute, New Delhi, and ICAR-Indian Veterinary Research Institute, Izatnagar got a "Good" cursory glance securing the position first, second, and third respectively. It was revealed through the study that ICAR-Central Institute on Fisheries Education, Mumbai did not get up to the mark of the total score which further falls under the category "Needs Improvement" and secured the position fourth position.

7. Major Findings

1) It was found that the majority (83.33%) of ICAR-National Dairy Research Institute, Karnal has provided the highest number of information on library website/webpage such as about library, library opening hours/working

hours/ timings/holidays, contact us, images/photo gallery, library rules, and regulations and library membership details, etc.

2) Three (75%) of ICAR-Indian Agricultural Research Institute, New Delhi has mentioned detailed information about library collection such as printed books, printed journals, general magazines/periodical, reports, CD/ DVDs/CD ROM, and reference sources/books, etc.
3) It was denoted that ICAR-National Dairy Research Institute, Karnal has provided the highest number of information on OPAC Facilities, Resource Sharing (CeRA), ILL/DDS, internet-based services, reading rooms facilities, and reprographic service, etc.
4) The ICAR-Indian Agricultural Research Institute, New Delhi has given the highest information (05) about E-Resources.
5) It was found that all the Deemed Agriculture University Library Websites/ Webpages are user-friendly to visit websites/webpages.
6) The 3 Deemed Agriculture University Library Websites/Webpages has a direct link on parents' homepage which is followed by 1 (25%) of the Deemed Agriculture University Library Websites/Webpages has a link under academics, infrastructure, facilities, etc.
7) All 4 (100%) of the Deemed Agriculture University Library has websites/ webpages but only one Deemed Agriculture University i.e., ICAR-Indian Agricultural Research Institute, New Delhi has a separate portal/website for the library.
8) The two Deemed Agriculture University i.e., ICAR-Indian Agricultural Research Institute, New Delhi and ICAR-National Dairy Research Institute, Karnal Websites used URL extension as res.in while ICAR-Indian Veterinary Research Institute, Izatnagar and ICAR-Central Institute on Fisheries Education, Mumbai are using nic.in and edu.in for their respective Library Website/Web Page as URL extension.

8. Conclusions

The library website is the virtual gateway as well as the most effective tool for promoting and disseminating the library services for any particular institute. The present study reveals that none of the Deemed Agriculture University Library Websites/Webpages comes under the "Very Good" score criteria which reflects the grade point "40-52". It was found that ICAR-National Dairy Research Institute,

Karnal (34) scores the highest number which was followed by ICAR-Indian Agricultural Research Institute, New Delhi (31) among the Deemed Agriculture University Library Websites/Webpages taken for the study. ICAR-Indian Veterinary Research Institute, Izatnagar website obtained the third rank with 27 scores. Further, it was revealed that no Deemed Agriculture University Library website/ webpage used Web 2.0 Tools in the library. There is no financial restriction to implement Web 2. 0 Tools in the library and these tools are available freely on the web. Used emerging tools in the library namely QR Code, web push notification, social plugin, resources discovery, visitor counter tools, cloud computing, and android app, etc. could enhance the library services for the fulfilment of library users. Here, Library Science Professionals must understand to fulfil the required information as per their needs of users and develop their own library website, and connect it to the university's main home page.

9. Suggestions

Based on the analysis and the findings of the study the following suggestions are made.

1) The library website should be separate which can be linked with the main homepage of the Agriculture University Website;
2) Librarian and Website Administrator must pay special attention regularly to update the information on the website to attract the readers;
3) Website developer makes available periodic statistical reports using (Visitor Counter Tools) summarising which pages/article/files are being accessed most; so that administrator can understand and realised which page is mostly visited by the users;
4) Librarians need to give importance to publicise the website effectively via using Social Plugins tools to which the readers pay particular attention namely newsletter, circular, events, and orientation programmes, etc.

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Impact of online database on the research work of Scientist of ICMR-NIV, Pune: A study

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Introduction: ICMR-NIV is the major regional Centre of Indian Council of Medical Research established in 1952 in Pune. It was established as a result of global program of RF (Rockefeller Foundation) USA for investigating the Anthropoid Borne Viruses. Its library is well equipped with thousands of journal back volumes and online databases such as SCOPUS and SienceDirect.

Now world come closer and research collaboration took place throughout the world. Up-to-date and timely information needed by the scientist for their research work. Online databases play an important role for giving right information at the right time to the right scientist.

Keywords: ICMR-NIV, Pune, Online database, SCOPUS, Scientist

1. Statement of the Problem:

The researcher wants to find out impact of online database on the research work of the scientist of ICMR-NIV, Pune and Scientist preferences online database such as SCOPUS and ScienceDirect for their research work

2. The Significance of the Research

The present study focuses attention on the impact of the online database on the form of research productivity on the scientist of the ICMR-NIV Pune.

3. Scope and Limitations of the Study

Scope of the present study is limited to total 43 scientists working in ICMR-NIV. The study was also limited to the data collected from the scientists from 2018 up to 2020 i.e. 3 yrs. only.

4. Objectives of the study:

1. To find out gender wise analysis of the scientist of ICMR-NIV, Pune
2. To find out whether online database is considered to be a better option for retrieving right information at right time.

5. Hypothesis:

H0: There is no significant impact of online database on the research output of the scientist.

H1: There is a significant impact of online database on the research output of the scientist.

6. Research Methodology

The Descriptive Research Method has been used for the present study with survey as a research technique. The primary data for the present study has been collected using telephonic call and written their answer on paper in the excel format. MS excel tool used for data analysis.

7. Data Collection

Researcher did directly contacted the scientist on telephone for conducting the interviews and collected the information, which is useful for this study. Institutes website and repository consider as secondary data for this paper.

Table No.1: Gender of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	32	74.4	74.4	74.4
	Female	11	25.6	25.6	100.0
	Total	**43**	**100.0**	**100.0**	

Source: Field Work

Table no 1. exhibit the gender of the scientist who were retrieving information by using online database and print media. Majority of the respondents amounting to 32 representing 74.4 percent of the total respondents were found to be Male and 11 respondents representing 25.6 percent of the total respondents were found to be Female. Male respondents gave more information than female respondents about online database. It is interpreted that, majority of the respondents who used online database were male viewers.

Table No. 2: Using online database regularly for Research Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	74.4	74.4	74.4
	Sometimes	10	23.3	23.3	97.7
	No	1	0.3	0.3	100.0
	Total	**43**	**100.0**	**100.0**	

Source: Field Work

Table no.2. exhibits the regularity of the scientist who were using online database regularly for Research Work in ICMR-NIV Pune. The researcher has chosen this variable to find out the scientist's regularity in research work. Majority of the respondents amounting 43 respondents representing 74.4 percent of the total respondents were using online database regularly.

The availability of computerized library with online database subscription, wifi campus encourage scientist to retrieve more information for their research.

Table No. 3: Online database for Research Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SCOPUS	31	72.09	72.09	72.09
	Web of Science	9	20.94	20.94	93.03
	Books/ Journals	3	6.97	6.97	100.0
	Total	**43**	**100.0**	**100.0**	

Source: Field Work

Table no.3. shows that ICMR-NIV digital library have subscription of SCOPUS online database. The researcher has chosen this variable to find out that which online database were used by the scientist for their research work. Majority of the respondents representing 72.09 percent of the total respondents were using SCOPUS online database regularly.

Table No. 4: Type of media preferred

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Only electronic media	09	23.24	23.24	23.24
	Only print media	1	0.02	0.02	0.02
	Both	33	76.74	76.74	100.0
	Total	43	100.0	100.0	

Source: Field Work

Table no.4 show the type of media preferred by the scientists of ICMR-NIV of Pune. The researcher has chosen this variable to find out the scientist's choice of media to retrieve information for research purpose. It can be seen that 33 respondents representing 76.74 percent of the total respondents preferred to retrieve information by using electronic media and print media as well.

8. Testing Hypothesis:

Table No. 6: One-Sample Statistics – Impact of online database on the Research work

	N	Mean	Std. Deviation	Std. Error Mean
Online database provides better quality of services than published books and journals	43	3.49	1.342	.200
Online database is preferred more than published books and journals	43	3.31	1.258	.188

Table No. 7: One-Sample Test – Impact of online database on the research work.

	Test Value = 0					
	Z	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Online database provides better quality of services than published books and journals	17.440	43	.000	3.489	3.09	3.89
Online database is preferred more than published books and journals	17.655	43	.000	3.311	2.93	3.69

The "P" Value is less than 0.05. Hence the null hypothesis is rejected and the alternate hypothesis is accepted. It means that there is a significant Impact of online database on the research work done by the scientist.

9. Finding and Conclusion

ICMR- NIV Pune male scientist are using more online database for their research work. Institutes digital library have regular subscription of SCOPUS and ScienceDirect online database. Majority of the scientists were using SCOPUS online database for their research work and references. Scientist preferred online database over print media. Due to digitalization online database easily available and accessible to all the scientist.

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A contextual note on the Sustainable Digital Archiving and Preservation - Issues and Challenges

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Abstract: Digital Archiving has been the most important issue considering the wide range of digital objects. During the recent times, the academic and research centres throughout the world have been actively involved in the archiving and preservation of their both print and electronic resources. Apart from the amassed benefits, the use of latest technologies in Digital Archiving and Digital Preservation, have presented plentiful of issues and challenges that the Librarians and Archivists should be concerned with. The present study will present an overview of various aspects related to Digital Archiving and Preservation, issues and challenges.

Keywords: Digital Archiving, Digital Preservation, Digital Libraries, Open Archival Information System (OAIS)

1. Introduction

In the recent years it has been observed that much emphasis was given on providing access to the Information though Digital Libraries / Institutional Repositories. The developments in and usage of Information Communication Technologies (ICTs) has shown a marked transformation in the functioning of the Libraries in academic and research institutions. The change can be visible in the mode of storing the large amounts of information, providing quick, remote and comprehensive access to the information, improved delivery of services to the users, etc. The adaptation of latest technologies in the Libraries has brought few benefits, and also posed issues and challenges to the Informational professionals that should be concerned with and addressed to.

Libraries are the places which are involved in the Digital Archival process in the academic and research institutions. They have setup their Digital Libraries / Institutional Repositories, the digital counterparts to provide digital information services.

The Society of American Archivists' has defined the preservation as follows:

1. The professional discipline of protecting materials by minimizing chemical and physical deterioration and damage to minimize the loss of information and to extend the life of cultural property.
2. The act of keeping from harm, injury, decay, or destruction, especially through non-invasive treatment.

As seen from above definition, the Digital Preservation is unlike traditional preservation and has notable differences. Digital Archiving of both the physical and digital content involves preservation, description, and access. Digital Preservation is a part of the Archival work. There has been significant shift in the terminology and the meaning for the term Digital Preservation, wherein the term **"Permanent Access"** has been linked to it. Digital Archivingincludes the set of processes and activities that are undertaken to stabilizesafeguard all kinds of scholarly information produced through scientific research and records of cultural heritage; and publications both in print and digital so as to make them retrievable, readable, usable, and to ensure continuedaccess for longer time. The process includes the digitization of the print and analog materials into digital format. The main intention of Digital archiving is to make sure of protecting the information of abiding value thereby providing access to the present and future generations (Conway, 1990: 206).

The Libraries have wellplanned and initiated their Digital Preservation programs by making mandatory policies which includes continuous allotment of financial, infrastructural and human resources for preservation program, precautionary and deterrent measures to stop from further worsening of materials, curative measures to bring back the usability of the selected materials, and the amalgamation of all the needs and requirements pertaining to the preservation and blending those into final program scheduling.

2. Archival vs Backup

In the context of Digitization, the terms **"Archiving"** and **"Backing up"** are being used interchangeably, however they are two different process. Both of these are related as they are involved in saving a specific version of a file. In a backup process only the latest versions of the saved files are retained, the others are discarded and whereas in an Archival Process the file is preserved as-it-is, and only withdrawn/ removed when it is felt that it has become anachronistic.

3. Digital Archival and Preservation - Issues and Challenges

The Digital Archival is repeatedlyexpressed in respect of the organisation, the available expertise, the technical knowledge being applied, infrastructure on hand and the best practicesthat are followed. The factors which are attributed to these terms are discussed here.

Preservation Policies And Its Development

In the present digital age, the information is of two kinds either born digital or has been transformed to digital format, to provide enhanced access of the diverse, wider and extensive range of digital assets to its clientele, not only just now but well into the future. To realise this objective a comprehensive mandatory organisational Digital Archiving and Preservation Policy is essential. This policy will enable the institutions to have a framework for implementing various preservation strategies. These policies are ought to be framed that are identical and on a par with their own parent institutions and function not beyond the preservation policy scaffold of the nation. The very purpose of giving structure to the preservation policy is to illustrate the institutions continuous commitment to their preservation strategies and procedures of its digital collections.

The Information policy will provide a comprehensive statement on the digital preservation process. Becker and Rauber in their article recommended that "While policies provide important guidance and set a framework for concrete planning, they do not provide actionable steps for ensuring long-term access… [and should not be confused with]… [a] preservation plan [that] specifies a specific, operational action plan for preserving a certain well-defined set of objects for a given purpose."

Lyman and Besser noted, "The long term preservation of information in digital form requires not only technical solutions and new organizational strategies, but also the building of a new culture that values and supports the survival of bits over time."

Beagrie, Semple, Williams, and Wright reinforced the idea that "…any long-term access and future benefit may be heavily dependent on digital preservation strategies being in place and underpinned by relevant policy and procedures… [and that]…[t]he digital preservation policy should be integrated into business drivers, activities and functions e.g. regulatory compliance, staff development, applied technology, academic excellence."

A key component in the development of policy as observed by Cloonan and Sanett, "We suspect that policy is lagging far behind the development of standards,

because the development of good public policy requires the appropriate political climate as well as the cooperation of numerous stakeholders."

The policy document should describe its intentions in the form of an objectives, provide guidance, easily understandable, explain the purpose, need for the preservation program that can be implemented. It should also consists of the legal mandates, categories of institutional commitment, the boundaries, challenges, guiding principles and operational principles, roles and responsibilities, collaboration, selection and acquisition criteria of the materials, levels of preservation, implementation, standards, statements pertaining to access and use, review and monitoring details etc.

The priority of an organisation is to prepare lucratively the digital preservation policy, embrace it into the organisations system, which enable the organisations to handle and grant access to their digital assets, which in turn provides framework for carrying out an effective digital preservation program.

Planning for Digital Archival and Preservation Programs

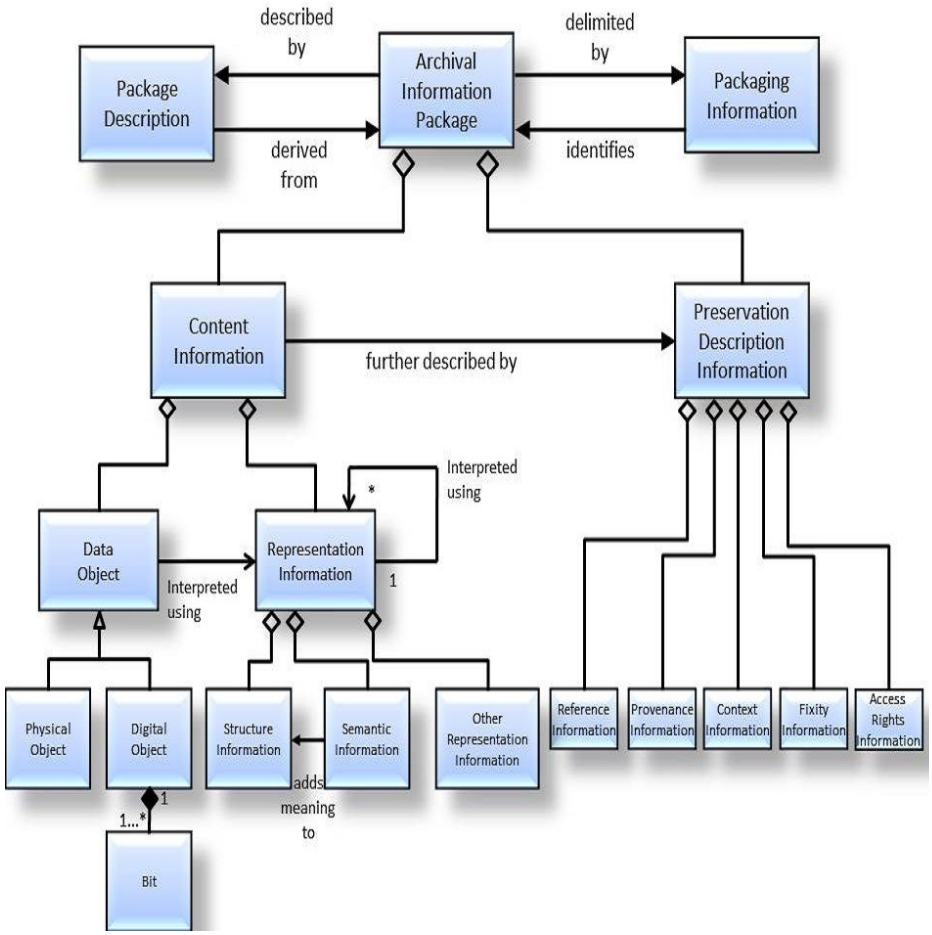
The Principle Investigator (PI) of the project is responsible for retention, preservation, distribution, and control of the data. While planning for Digital Archival and preservation programs the following are the prime aspects to be considered in the initial stages.

- Subject Area or Discipline
- Sharing mechanism
- File formats for long term access (including hardware and software obsolescence)
- Full text searchable / availability through other search engines
- Persistent Identifier (Digital Object Identifier)
- The data retention policy
- Ownership and Privacy
- Maintaining the integrity of data

The Digital data are fragile, susceptible to bit rot and are likely to degrade or decay over time. The solutions are *refreshment* and *replication*. Refreshing data is a process wherein the data is copied at regular intervals onto a new disk or drive. Replication means copying the original data and keeping two copies (i) external and (ii) external remote and preserved in two different locations. The networked files servers can be used to manage the long term archiving digital data.

Infrastructure

Availability of sufficient infrastructure to handle Digital Archival of the knowledge resources,is an important issue. Most of the Libraries does not have proper infrastructure to undertake the Digital Archival program. The Preservation Policy thus framed should be an aspirational and provides the required quantum jump to develop a scalable, reliable, sustainable and auditable infrastructure for the Digital Preservation Program. The hardware, software and the storage media to be used in the Digital Preservation Policy should be in compliance to the environmental standards, specifications pertaining to quality control, and the security requirements.



(Source: http://www.oais.info/)

Fig: OAIS Reference Model (ISO 14721)

The Libraries can check the possibilities of the use of open source software wherever it is feasible and also make sure that they become interoperable. The intention of building digital archive is to be in accordance with the Open Archival Information System (OAIS) and other digital preservation standards and practices while ensuring the integrity of the data particularly when there are distributed and disparate systems. In such cases, these best practices and the standards makes the communication effective. OAIS Reference Model can be utilised as an yardstick that defines a set of responsibilities that an every newly developed OAIS archive should always accomplish, thus making it distinguishable from other uses of the term archive.

Financial Constraints

In any academic organisation, the Digital Archival and Preservation process of the information assets is a continuous process. To develop and implement an effective and efficient Digital Archive the permanent financial commitment for over periods of time, from the parent institution is essential. This trend of decreasing the funding to the Libraries have effected such operations. The diminishing financial resources from the parent organisation have made imperative to the libraries to approach the national funding agencies in search of funding for the proposed preservation programs. However, the lack of infrastructural and human resources at the Library end has made the issue more critical. Unless there is a mandatory national level preservation policy supported with concerted effort from all the stakeholders including the political and academia may bring in the desired change for effective implementation of the Digital Archival and Preservation programs.

Identification of The Staff - Roles and Responsibilities

The identification of human resources who have requisite skills is an issue that needs to be undertaken on priority basis. The organisation should make an concerted effort in this direction for proper and effective implementation of the Digital Archival plan. There can be variety of personnel with different roles and responsibilities.

The Administrators are the designated persons in the Library who will be responsible for selection and for ongoing curation tasks. There should be specialists and also teams for establishment and managing the Digital preservation programs. The requisite qualifications are specific and highly skill based, depending on the equipment and the software that are going to be used. Hence appropriate and standard procedures have to be followed for the identification of staff and fixing their hierarchies, roles and responsibilities. The roles and responsibilities can be either institutional or unit level.

Migration and Preservation

Preservation is an important phase and has to be given utmost importance in Digital archival management, where the content is preserved along with the appearance and sense of the digital object for future use. One of the characteristic of the digital storage media is that they are most vulnerable to deterioration even when it is put under ideal conditions, and the data may get lost when start deteriorating. Digital technologies puts before several challenges for the Information managers particularly in the preservation of digital assets. The purpose of migration is to overcome the technological obsolescence by transferring digital objects from the existing storage media / hardware to the latest one over time. There have been few apprehensions that during the migration process, there is a chance of loss of data or creation of unwanted things in respect of the quality.

Software Obsolescence

The Advances in the Information Communication Technologies at an exponential rate has resulted in novelty and creativity in the hardware, storage media, and software. It is highly recommended to keep the data in an open source format so that when a new version of the software is released and the old one becomes obsolete, it would be easy and have continued access to older digital objects. The older data can be migrated / converted into open format which facilitates both preservation and sharing. Whenever a new version of software is released, the vendors release the strategies or provide the compatibility for upward migration. Many organisations are inclining themselves towards the commercial vendors to avoid the risk, and also there are no major hardware/software migration issues.

Development of Wide Varieties Of Document And Media Formats

In the present times, it has been observed that there has been proliferation of document and media formats. Not only they are heterogeneous in storage, but also complex in retrieval and data formats developed for special purposes. Adding to these challenges is that they carry their own hardware and software dependencies. The Libraries have not other go than to contend with these extensive diverse digital formats.

An alternative to migration process is, the **Emulation** that preserves the use of the digital object. In this method an emulation registry is created containing the details of software, hardware and the information about how to recreate the same environment.

Copyright and Intellectual Property Rights

Before proceeding on to the Digitization of the documents, the copyright permission are to be sought from various publishers. The program has to be complied with all aspects related to copyright / intellectual property rightsand other legal rights related to copying, storage, modification and use of digital resources. In case of an online journal, most of the publishers according to the licensing agreements, they are not allowing the users to duplicate the documents or the storage. In case of the printed journal, if the library subscribes, the it will have permanent access, whereas in case of online journal, once subscription ends, the access to the document is ceased.

No Established Standards

The critical role of the Digital Library and an Archive is to ensure the enhanced accessibility of the information in an enriched way. It has been observed that digital preservation mostly remained non focussed area not getting the required attention in the area of research. As a consequence of this there does not exist many proven or established standards, protocols and the methods for preserving these digital information. Mostly it was purely an experimental based methods attached with risks, with untested methods.

Digital Rights Management

The developments in Information Communication Technologies has enabled the institutions of higher learning and other organisations publish the huge amounts of scholarly information in the form of databases and have been made available and accessible anywhere and anytime. As a result of this, there have been concerns on how well the information is protected and managed properly. The privacy infringement issues can be unauthorised acquisition and access, illegal penetration into the computer networks and so on. There should be sound Digital Rights Management which will take care of all these issues.

Skills and Education

The major and important issue in Digital Archiving and Preservation next after the state of the art infrastructure is the technical skills and capability of the human resources involved in the Institutions. It can be argued that not many institutions are well equipped with the skilled persons. The reason can be equated to the not so well organised Information Institutions who are providing training in these necessary areas. This has injected challengesin digital archiving and preservation programs in reference to both digital collection building and also dissemination

of digital information services. Novel solutions are to be lucratively developed to tackle such issues and to develop an effective digital archives.

4. Conclusion

Digital Archiving and Preservation is an important aspect that allows the Institutions to preserve, manage and provide access to these knowledge in the form of digital assets in the future. The issues and challenges in the digital archiving and digital preservation are very significant and these necessitate a coordinated and concerted effort from all the stakeholders. The librarians and the archivists have to rise up to these challenges and initiate the Digital Archiving and Preservation project, develop strategies, guidelines and standards for its successful implementation.

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Open Educational Resources for Redefining the Learning Horizons: An Evaluation

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Abstract: Open Educational Resources (OER) is commonly understood as the educational resources of open access in nature and are available at no charge. However there are certain policies which make a material OER. Hence, such resources reside in the public domain under an open licence or intellectual property licence granting permission to use and reuse it for free. OER also includes printed contents that are openly licensed. The education, being a significant phase of human life urges for the open learning where knowledge is open to everyone. OER would work well for teachers as well as for students and researchers in their teaching and learning ontogeny due to its inherent flexibility of the openly licensed resources. The ever extending sphere of open learning is self-evident with the rising numbers of OER platforms. This paper explores the potential of OER in the current learning situation. It investigates the importance of Open Access Resources and Open Educational Movement in the changed dimension of information scenario. The paper discusses major benefits and challenges of creating and adopting OER. Some renowned OER initiatives are also explored in the study. It further examines the importance of open licenses for OER and the role of Library and Information Centres (LICs) in promulgation of OER.

Keyword: Open Educational Resources, Open Education Movement, Open Licenses, OER Initiatives, Copyleft, CC SA

1. Introduction

The changed landscape of teaching and learning is indicating the need to keep pace with the enormous amount of information which is the result of constant research, exploration and investigative human mindset to do better in everything that one does. The paradigm shift from conventional mode to digital has turned the information creation, organization and diffusion into a rapid process. The enormous amount of information created is organized but locked for those who do not have a paid subscription and educational activities. The information

disparity is widening the information gap and so the concept of open source and open access. The open movement with aims of promoting educational technology, research, learning, and teaching is omnipresent and plays a vital role in the development of an education niche. Unlike the conventional methods, the mode of teaching and learning processes in such open access environment enable an aspirant to swiftly complete a course. The worldwide learning community has created the global classrooms which is based on technology and are growing towards openness of teaching and learning materials. However, availability of the supporting peripherals and the information technology infrastructure are mandatory for effective use of resources to eliminate such disparities.

2. Objective

- To recall the importance of open access resources and open educational movement in the changed dimension of information scenario
- To explore the potential of OER in the current learning scenario
- To identify the major benefits and challenges of creating and adopting OER
- To explore some reputed OER initiatives
- To examine the importance of open licenses for OER
- To discuss the role of LICs in creating and adopting OER to bring in better information equilibrium

3. Information as a Commodity

The information has become a pure commodity in the business of knowledge. Success of an individual or an organization today imperatively relies on how effective and efficient their information system is. The cost and access to course materials are the two major issue normally emerges as a concern in the education scenario. Modern information systems with a huge capacity to store and transfer vast amount of materials enable the easy access through the supporting technological aids. The quality of output is undoubtedly dependent on the quality of input. The information sources that our Library and Information Centres provide access to become the deciding factor of the quality output. With the ever growing horizons of science and technologies, anything that keeps one away from the needed information invariably creates obstruction in the creation of quality information. Ever shrinking monetary resources to be invested in organization and

diffusion of information make it next to impossible for the education institutions which can never manage to cover everything in the respective area.

4. Open Movements and OER

With the advent of computer technology and the internet during the beginning of 1980s, the concept of open movement emerged to facilitate access to different kinds of materials, information and the technological codes for free. Open education movement, open source movement, open learning, open access movement and open data movement are the results of such open movements emerged during the years to share freely the educational materials, softwares, online access to scholarly communications and research data respectively. OER is an extended part of Open Education (OE) that exists with the concept of sharing information educational sources to the maximum extent in the best interest of human development. The concept of OE has emerged from the technological development that has happened along the time. Open access to educational opportunities has always been a core defining characteristic of open learning which includes openness and flexibility in terms of time, place and pace of learning (Karunanayaka, 2017)

OER have been defined in various ways by different researchers but a key concept that it is accessible and free to use. According to Butcher, "Open Educational Resources (OERs) have been defined as "any educational resources (including curriculum maps, course materials, textbooks, streaming videos, multimedia applications, podcasts, and any other materials that have been designed for use in teaching and learning) that are openly available for use by educators and students, without an accompanying need to pay royalties or license fees" (Butcher, 2011). The basic feature of OER is that it comes with open licenses or is available in the public domain. UNESCO is commonly cited and defines OER as "any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and reshare them. OERs range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation" (UNESCO, 2016). Further UNESCO defined "OER are a strategic opportunity to improve knowledge sharing, capacity building and universal access to quality learning and teaching resources" (UNESCO, 2017). Bell said that "OERs are educational materials and resources that are publicly accessible, meaning that they are openly available for anyone to use and under some licenses to re-mix, improve and redistribute". Bell, 2018).

OER is a new idea that is coupled with new technology and it is vastly different than the traditional textbook/lecture format still used by much of Higher Education

(Leber-Gottberg, 2017). OERs are being effectively used for teaching as well as learning as these are made available via online platforms for free. OER has the potency to equalize the education and making the educational materials affordable and accessible to the aspirants and improve their learning outcomes. It has become a replacement for traditional classroom teaching and faculty interaction programmes, however enhancing the potential of both teacher and the learner. Such types of resources are either provided or funded by educational institutions or by non-profit organizations.

Open Educational Resources (OERs) are freely accessible reading materials available in the public domain to use and adapt for teaching, learning and research and development. They are generally available without any copyright restrictions. However, materials can also be available under open licenses. The contents either be created/owned by an individual or by an organization with an intention to support teaching and learning process and are free from financial and technical barriers. The term OER was coined in the Forum on OpenCourseWare held in 2002 by UNESCO. UNESCO defines OER as any type of educational materials that are in the public domain or introduced with an open license. The nature of these open materials means that anyone can legally and freely copy, use, adapt and re-share them.

According to Wiley, for an educational resource to qualify as "open," it must comply with what are known as "the five Rs of OER" such as retain, reuse, revise, remix and redistribute which is diagrammatically represented in Fig. 1

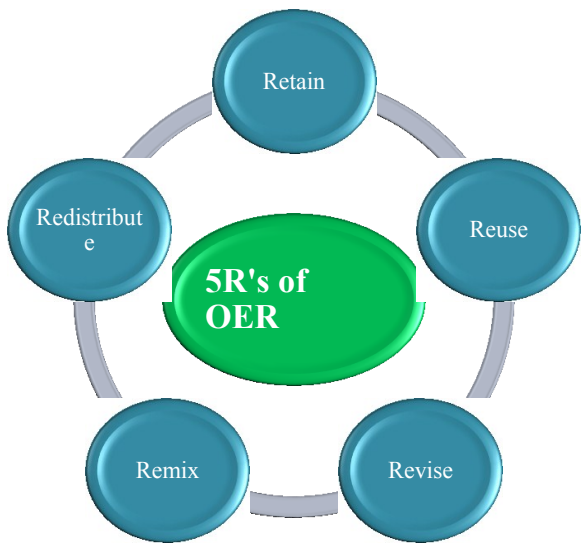


Fig. 1: 5 R's of OER

1) *Retain:* It facilitate the right to make, own, and control copies of the content including downloading, duplicating, storing and managing the materials
2) *Reuse:* Reuse gives the right to use the content in a wide range of ways such as in a class, in a study group, on a website or via video
3) *Revise*: Provide the right to adapt, adjust, modify, or alter the content itself such as translating the content into another language
4) *Remix:* Extend the right to combine the original or revised content with other material to create something new such as to incorporate the content into a mashup)
5) *Redistribute:* Giving the right to share copies of the original content along with revisions and also remixes with others such as give a copy of the content to a friend.

OER has the potential to grow, develop, utilize and access the most recent and newest information right at the faculty and students fingertips. Cost of prescribed course materials becomes a significant drawback for the aspirants, especially students who intend to pursue their educational process. OER provides better opportunities for the students to expand the horizon of their classroom beyond the specific study materials to facilitate different educational materials. The learning materials ranging from text books, lecture notes, streaming and instructional videos, audios, class lectures, assignments, modules, projects, videos, tests to software are included in OER. OER is one of those mechanisms which run together to achieve the open technology movement and open access movement (Fig. 2).

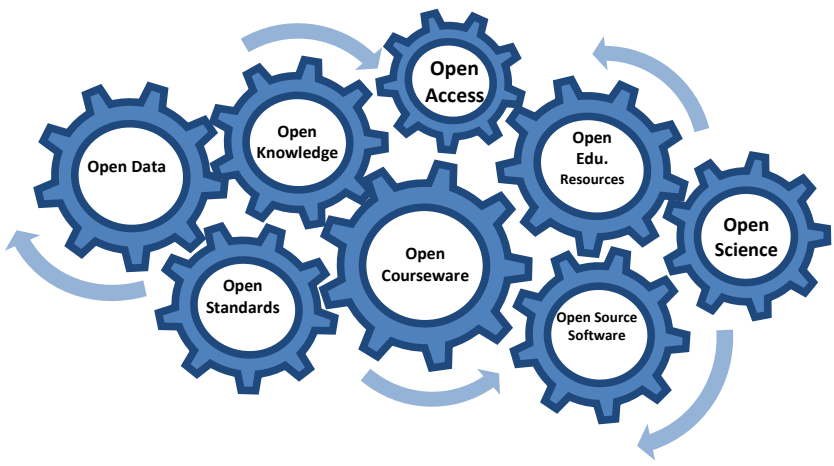


Fig. 2: Open Movements

5. Benefits of OER

- Highly cost effective as they facilitate group learning/individual learning on interactive medium in a multimedia environment
- Does not restrict access based on geographic, education and socio-economic background hence adoption enhances access to resources
- Gate way to profuse resources in diversified branches of human knowledge
- Possesses great deal of flexibility in as it runs according to the learner's timeline and also learning requirement
- Helps to ascertain and maintain global standards in organization of resources and learning process
- Provides more authenticity to the content as it is open to every individual learner and expert
- Learning process is mostly user driven as consumer here often becomes prosumer
- Endless opportunities to collaborate with every individual to bring in the most updated information in the field and this facilitates the worldwide confluence of perspectives on a given topic
- Ready to access, easy to share and can be preserved forever
- Provide ample opportunities for an educator to share knowledge, the educational materials and participate more broadly in their field to enhance their visibility to a wider audience.
- Act as an additional resource for learning and the movement towards OER has stimulated innovations in teaching and learning practices.
- Enhance quality of materials through peer review, user feedback and adapting and modifying resources
- Encourage engagements and facilitate better skill development

6. Challenges of OER

- Basic infrastructural requirements such as computer with an internet connection and communication accessories

- Inconsistency in quality control appears as there can be many providers and no adequate screening of content
- Cost involved in maintenance of technical aspects of the system and vulnerability to breakdown and malware
- The faster the obsolescence of technology the huger the squander of efforts, resources and time
- Often learning comes free but not the supporting materials which may be copyright protected
- Tailoring emerging trends and updating of audiovisual content accordingly becomes exasperating task
- Involves minimum cost, expertise and willingness to contribute which may hinder the scalability, sustainability and the larger accessibility.
- Lack of awareness of open licenses among authors and creators
- Usage of OER in teaching and learning environments has not been studied exclusively
- Lack of well defined policy for checking the quality of resources available in OER

7. OER Initiatives

The realization of how important it is to make the educational resources open access is so rigorous that the UNESCO World OER Congress proposed the governments to adapt open license to education materials which are publicly funded (UNESCO). Open access concept has gained greater familiarity among learns (Iqbal, 2017). Over a period of time many efforts have been made to build various OER platforms for creation, collection, organization and distribution of educational resources. Most of such initiatives evolved by individuals and interested communities. Efforts are happening at global level to bring out learning irrespective of geographical limitations. Open Learning at school level is incredibly on raise and collaborative efforts are being made by professional organizations to come up with extremely useful content. Areas like Mathematics, Science and Social Studies are at the centre of collection for upto K-12. The contents beyond college and university levels have included diversified branches of knowledge. Audio-visual and interactive content

are the most common features of content which facilitate experiential learning though the learning happens virtually.

In India, the National Repository of Open Educational Resources (NROER) is an initiative with government support which is devoted to the content development for school level. The initiative includes a huge collection of content related to various branches of knowledge in many Indian languages. With the concept of flip book format, textbooks of CBSE are made available online. The OER contents in multimedia are developed by SCERT, SIERT, CCERT, SIE, Vigyan Prasar, Gujarat Institute of Educational Technology, SIET and many other organizations (NEOER). Ventures initiated by non-governmental organizations and individuals have been proven to be equally professional as government funded ones. Online certification courses provided through MOOCs by the National Programme on Technology Enhanced Learning (NPTEL) have been developed by experts of IITs and IISc. The popularity of NPTEL MOOCs is evident with the 8 million learners who enrolled for the courses. The contents of most of the OER are used by learners as well as teachers. Ministry of Human Resource Development (MHRD), Government of India in collaboration with the supporting authorities like UGC and AICTE are encouraging the incorporation of MOOCs in the curriculum of semesters. Core professional experts from prominent organisations like NASA, The California Academy of Sciences, MIT are taking part in developing the content for Khan Academy (NPTEL), Governmental level initiatives such as e-PG Pathshala (an initiative of the MHRD under its National Mission on Education through ICT (NME-ICT) being executed by the UGC), SWAYAM (Study Webs of Active Learning for Young Aspiring Minds, a programme of the MHRD, GoI) etc. Platforms such as Teacher Education through School-based Support in India (TESS-India) have been a great support for teachers who want to nurture and perfect their teaching practice. The congregation of over 200 Indian educational experts have contributed to the development of the content on TESS-India. It even provides the search link on their website which brings traces of resources on OERs around the world (TESS-India). CK-12 aims to pair quality content with technology. The content is also available in translated versions of Spanish, Korean, Deutsche, Chinese, Greek and Polski (CK-12). The concept of personalised learning gaining greater importance as it helps to understand the needs and goals of each individual learner. OER with an option to personalized learning is becoming more prominent such as Gooru which provides dynamic instructional approaches and academic aid which intend to cater the needs of intense learning, individual interests, aspirations of learners (Gooru). The Institute for the Study of Knowledge Management in Education (ISKME) is one such OER which conducts social science research along with developing evidence based innovations to enhance knowledge sharing in education. ISKME promotes

student centred teaching and learning practices where it also aiding in policy making, designing and assessing of education contents and practice (ISKME).

MIT's Open courseware happened to be the first to offer open educational resources and India is one of the member countries in the initiative. Few initiatives on OER that have emerged worldwide is represented in Table 1.

8. Copyleft License for OER

The intention of every output of research is for the amelioration of mankind. Knowledge activities are intended for the public utility more than financial returns. The knowledge gap widens with the commercial publishers placing electronic walls which only unlock for subscribers. As the technology advanced electronic information systems are systematically managing to create the information disparity which did not so rigorously exist in printed sources (Pavlovic, 2010). An academic/research work reaches wide range of population than it being in closed access. Open sources software movement eventually became the cause for concept of OER. Models such as Open Data, Open Content, and Digital Rights are the extended parts of open access movement (Garcia-Penalvo, 2010). Instead of locking out information resources it is advisable to provide access, modification rights, and redistribution opportunities for commercial or noncommercial purpose at the discretion of author. The information disparity created by copyright is the reason for emergence of Copyleft concept.

Copyleft offers people the right to use copy and modify. Copyleft is a form of licensing that can be used to maintain copyright conditions for all works which can be governed by copyright law. The range of works may be from computer software to documents and art. Unlike the contents in public domain which are non-copyrighted, copyleft facilitates owners to apply copyright terms to their work with credit for one's work on every use (Muruli, 2017). Copyleft movement is more about users' rights to use and consume creative works rather than about the rights of authors (Dussollier, 2006).

Among the bunch of creative common licenses being used, Creative Common Share Alike (CC SA) falls under copyleft license. Unlike in copyright, a CC SA works as a grant of permission from one-to-all on specified considerations by the creator rather than the normal one-to-one use license, (Goss, 2007).Copyleft principles restrict using the work for proprietary or commercial purpose. A copylefted work, every time it is used and modified, is distributed freely for the further users. In the chain of usage, the entitlement of free use and re-distribution remain free from the first creator till the last user and there will not be any proprietary/commercial

intervention. With the principles of copyleft there exists GNU Free Documentation License which is meant for softwares. Among most of the OERs existing, the adoption of CC SA seems to be common.

Table 1: Some OER Initiatives in different parts of the World

Resource	Initiated by	Year of Est.	Content/Attributes
Gooru	Collaborative venture	1993	• a free personalised learning solution • helps teachers to find, remix, and share collections of web resources on any K-12 topic • Content in many Indian languages • Online quiz helps for instant feedback
MIT OpenCourse Ware (OCW)	Massachusetts Institute of Technology (MIT)	2001	• More than 2000 courses available online • Consist of various types of materials such as lecture notes, streaming videos of lectures, discussion topics, reading lists etc. • Global level initiative • India is one the international members
ISKME	Lisa Petrides	2002	• Aims to improve the practice of continuous learning, collaboration, and change in the education sector. • facilitates social science research, develops research-based innovations • assists policymakers, foundations, and educational institutions in designing, assessing, and bringing continuous improvement to education policies, programs, and practice • Supports open author-OER environment • Being instrumental in creation and sharing of essential information

NPTEL	Indian Institutes of Technology (Bombay, Delhi, Kanpur, Madras, Guwahati, Kharagpur, and Roorkee) in association with the Indian Institute of Science, Bangalore.	2003	• Collection of over 735 courses in web/video format has been provided in different branches of engineering and physical science, management science. • Indexing of content and keyword search developed for better accessibility. • Today it seems to be one of the major Indian OER at undergraduate and postgraduate levels.
Curriki	Sun Microsystems	2004	• Rich resources on various Arts, Education, Health, Mathematics, Science, Social Studies etc., • Knowledge to cater upto K12 and beyond • Knowledge base is built by teachers, parents, pre-service and new teachers and students. • Personalised learning through personal learning networks and learning communities • Adopts create common licenses
eGyanKosh	IGNOU, India	2006	• e=electronic, gyan= knowledge, kosh= repository • Collection of more than 30000 resources • Wiki for Collaborative content generation • Webcasting of Broadcast channels
CK-12	Neeru Khosla and Murugan Pal	2007	• 'Flexbook' concept for textbooks • Worldwide users • Contents on all branches of Mathematics and Science • Available in multiple languages

Khan Academy	Salman Khan	2008	• Available both on website and app • Wide range of subject from mathematics, statistics, science and engineering, arts and humanities to economics and entrepreneurship. • Content available over 28 languages • Funded by multinational companies
Standford Engineering Everywhere (SEE)	Standford University	2010	• Collection of courses offered • Lecture notes taught by Standford university professors • Offer introduction to Computer Science and advanced courses in artificial intelligence and electrical engineering • Consist of various types of course materials such as lecture videos, syllabi, handouts, homework and exams. • A Creative Commons license allows for free and open use, reuse, adaptation and redistribution of SEE material.
TESS-India	The Open University UK, - Government of India's Ministry of HRD - British Council -Save the Children India	2012	• aims to strengthen and transform teaching professional development and classroom practice. • Provides scalable approach to pre- and in-service teacher education and includes participatory child-centred pedagogy. • 200 freely available Open Education Resources (OER) in multiple languages. • Contents are CC-BY-SA licensed • Subject range-Science, Social Science, History and Law etc.,

OpenStax	.	2012	• non-profit ed-tech initiative based at Rice University • contains peer-reviewed, openly licensed textbooks • Includes textbook on different disciplines such as Mathematics, Science, Social Sciences, Humanities, Business etc
NROER	NCERT Department of School Education and Literacy, Ministry of Human Resource Development, Government of India.	2013	• Open courses for school level • OER mapped to school curricular • Device independent electronic text books • Contributions from institutions and individuals for collection

9. Role of LICs in Bridging the Gap

- LICs are positioned at the center of this whole process for their inherited role of collection, organization and distribution of knowledge. The LICs are shouldered responsibility of tailoring of ceaseless information emergence to the existing information system which only makes the system more meaningful and never a complete one. Public Private Partnership (PPP) is a feasible model to be adopted by authors, publishers in coordination with information centres. The collaboration of Government and non-governmental organisations, donor agencies, and corporate bodies will help to address the issues of digital divide which the targeted learning communities need initiatives with (Das, 2011).
- Awareness among the needy seems to be poor for the best utilization of available OERs. This needs for the LICs to explore, combine and propagate among the learning communities.

- Aggregation and creation of gateways of such resources have become the need of the day and information sector with proper framework can handle the information explosion.
- The need to bridge the gap between colleges/universities and industry is ever increasing and this can be handled well with the extended learning activities like workshops and hands-on training programs. Though some OERs have incorporated this concept, policies in this direction needs to be formulated in association with LICs.
- The unexplored areas of learning on OER platforms may be brought into the notice of experts in the related fields by LICs being instrumental in advocating the emerging needs.

10. Conclusion

The emergence of technology of modern times has taken the learning beyond the classroom. Virtual learning has redefined the concept of true learning which is never limited to textbooks and classroom. The concept of "Knowledge is open for every seeker anywhere" is made to be a reality and it is indeed a right of every learner to have access to knowledge. Since then the MIT launched the first large-scale OCW initiative around two decades back the growth and acceptance of OER globally across the discipline and various educational levels to support the teaching and learning process. It is equally an advantage for a student or an instructor or an institution in their endeavours to teach and learn. It enables effective learning opportunities for everyone which can be easily adapted and shared. However IT enabled infrastructure need to be adopted more for creating, distributing and promoting the OER. Further, educators who wish to share their contents should be facilitated with platform of OER. OER texts are developed by those knowledgeable in the field. Development and Implementation of OER need to be funded by the Government for longer time to ensure the quality and sustainability. Further, the usage of OER also has to be guaranteed in the largest possible way to bring greater value to the educational experience. Adoption of open licenses needs to be popularised among academic community for a promising learning environment in the days to come. With the advent of Information and Communication Technology (ICT) and Internet Technology (IT), open access movements and other new emergence of technologies have reshaped the landscape of the activities and services to be performed by the libraries. Hence it is the right time for each library to rethink and redefine their roles to stay relevant in the changing scenario.

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Open Source Software and Libraries

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Abstract: Open source software is software which is free to use, study, modify, and distribute for any purpose, which is enforced by an open source license. It is powerful and developer-friendly because it lowers the barriers to adoption and collaboration, allowing more people to spread and improve the software quickly. The main aspect of OSS is that it gives users the potential and power to control their own computing, relative to closed source.Library professionals should be aware ofthe advantages of open source software and should involve in their development. They should have basic knowledgeabout the selection, installation and maintenance. OSS requires a greater degree of computing responsibility than proprietary software. Library professionals don't seriously think about the advantages of Open Source Software for automation and hence are reluctant to use it. They do not have the expertise to support Open Source Software. This paper highlights major open source library software and implementation in libraries.

Keywords: Open Source Software, Library Professionals, Information Technology

1. Introduction

The concept of open source affects many fields of study from computer software and hardware to architecture, health, science, robotics and even politics. Linus Torvalds predicted this proliferation of source openness when he said: "the future is open source everything". But another founder of open source movement, Eric Raymond, refused the using of this concept about applications outside software (Wikipedia, 2009).

When a software is open source, the developer is making the source code open to further development and modifications which can then be sell as proprietary software by the developer who modified the code. It is often developed in a public, collaborative manner.

Long time ago we had crude card catalogue systems that kept things organized, but were difficult to maintain.But with the current technology and computing capabilities, organizing our libraries has never been easier or more efficient. With the power of technology, Users were able to locate a particular book through internet and picking it up upon arrival, rather than wasting the time scouring the aisles looking for next read. Just because the world has been blessed with amazing software and computing solutions that make every task easier to do, it doesn't

mean that every library in the world is using these solutions. Many Libraries don't have ample amounts of money to burn, and any that they usually go to purchasing additional resources for the library.

Because of this need for software, the open source has been receiving increased attention lately in the library world. Open Source Software can benefit libraries by lowering initial and ongoing costs, eliminating vendor lock-in, and allowing for greater flexibility.

2. Open Source Software

Open Source Software is software that includes source code and is usually available to public at no extra charge. There are additional requirements besides the availability of source code that a program must meet before it is considered open source including: the software must be free to redistribute; derivative works must be allowed; the license cannot discriminate against any person(s)/organization; and the license cannot discriminate against any fields of endeavor. Software that is licensed under an open source license allows a community of developers from around the world to improve the software by providing modifications and bug fixes, if any.

Libraries have to realize many advantages by using open source software. One of the most obvious advantages is the initial cost. OSS is generally available for free (or at a minimal cost) and it is not necessary to purchase additional licenses for every computer that the program is to be installed on or for every person who is going to use the software. OSS not only has a lower acquisition cost than proprietary software, it often has lower implementation and support costs as well.

It is easier to evaluate OSS than proprietary software. Since OSS is freely available to download, librarians and systems admins can install complete full versions of the software and evaluate compete package. This can be done not only without any license fees, but also without having to stick to a vendor's trial period or evaluate a limited version of the software, or deal with the vendor's sales personnel. If the library likes an overall open source package but would like a few added features they can add these features themselves which is possible because of the availability of the source code. Even if a library does not have in-house expertise/programmer, they can benefit from source code availability because another library may be able to provide them the fix or they can hire a consultant to make the changes that they desire. Fuchs (2004) points out that if a proprietary program "is deficient in some way, the user must wait until the vendor decides it is financially viable to develop the enhancement - an event that may never occur". With open source

software the user can develop the enhancement and modifications themselves and be productive.

3. Open Source Software: Advantages

- **Quality software**: Evidence and research indicate that open source software is good stuff. The peer review process and community standards, plus the fact that source code is out there for the world to see, tend to drive excellence in design and efficiency in coding.
- **Lower software costs**: OSS require no licensing fees. So are no maintenance fees. The only fees applicable are for media, documentation, and support, if required.
- **Lower hardware costs**: In general, Linux and open source solutions are elegantly compact and portable, and as a result require less hardware power to accomplish the same tasks as on conventional servers (Windows, Solaris) or work stations. The result is you can get by with less expensive or older hardware.
- **Simplified license management**: Once the software has been obtained, it can be installed uncountable times and in as many locations as you need. There's no need to count, track or monitor for license compliance.
- **Support**: Support is available for open source often superior to proprietary solutions. First, open source support is freely available and accessible through the online community via the Internet. And second, many tech companies are now supporting open source with free online and multiple levels of paid support. For example, Liblime.

4. Open Source Software for Libraries

Integrated Library Management Software

1. **Evergreen**

Evergreen is an ILS which is developed by Equinox Software. It is a ro-

bust,enterprise level ILS solution developed to be capable of supportingthe workload of largelibraries in a fault-tolerant system.

2. **PMB**



It is an ILS which is developed and maintained by the French company PMB Services. Features include the library management, watch and the documentary products, publication of editorial content, electronic document management.

3. **Refbase**



It is a web-based institutional repository and reference management software which is often used for self-archiving. It is licensed under the GPL and written in PHP and uses a MySQL as backend.

4. **Koha**



It is an open source Integrated Library System (ILS) which is used worldwide by public, school and special libraries. The name comes from a Māori term which means gift or donation. It is a web-based ILS, with a SQL data-

base (MariaDB or MySQL preferred) backend with cataloguing data stored in MARC and accessible via Z39.50 or SRU.

5. **OpenBiblio**

   It is also an open source Integrated Library System. The software is popular with small and rural libraries worldwide due to its simplicity, extensive language support, and good documentation.Created in 2002 by Dave Stevens and currently maintained by Hans van der Weij.

6. **NewGenLib**

   It is an integrated library management system developed by Verus Solutions Pvt Ltd. Modules in this software includes Acquisitions, Technical Processing, Serials Management, Circulation, Administration, MIS Reports, Task to-do today, OPAC.

5. Conclusion

The Internet and the computing power are changing constantly and becoming more powerful. We could create a more respectable and resourceful libraries with that power. By using open source, we can cut down the cost of software (proprietary) used and invest in acquiring more useful resources like books, journals, etc., or can be used to hire more personnel who can provide technical support to the existing resources. In addition to the free-of-cost aspect of the software, we can modify the software according to the requirements of the libraries. Hopefully, the libraries ought to explore and learn the usefulness and need for open source and implement in their libraries. These make the libraries cost-effective and more resourceful.

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Realizing What's Essential in Collection Development A Case Study on E – Resources and Services

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Abstract: "To ensure that the potential of Digital technologies is realized for all and make full contribution to equality and development, Digital Literacy needs to receive the necessary recognition and investment,"IFLA statement on Digital Literacy on 18th August, 2017. In twenty-first century, all the resources are available in electronic form. Some are open sources and a few are subscribed and paid. Millions of people use this digital platform to post, exchange and to publish. They can access in multiples all round the clock around the world simultaneously. Because of these advantages everyone has to depend and develop Digital Literacy. Transformation of the Library and Information Centres is highly essential to reinvent its collection development from traditional to digital form. It is the responsibility of the Librarians to make aware of the e- resources available in the Library and how they benefit the faculty, research scholars and students.

Keywords: Digital Literacy, collection development, transformation, digital form, e-resources.

1. Introduction

AS it is very important to have information in time to save the time, money and strain of a user, the collection development and its management of a Library have a key role in the development of an Organization. The advent of ICT (Information and Communication Technology) brought many changes in every field. Internet and the smart phones brought everything into one's hand to react immediately and it has changed the scenario of the Library and Information Science to the Digital format.

2. Scope of the Study

This paper has dealt about the change in usage of resources in three different types of Libraries in the same city called KURNOOL. It is the District Headquarter called as the "Threshold of Rayalaseema" a region in Andhra Pradesh.

3. Limitations

The study is limited to only three colleges in Kurnool city. The three college Libraries belong to three different disciplines of study i.e. Engineering, Dental science and under and Post Graduate college with autonomous status. There are more than fifty colleges in Kurnool city but the study is carried out in the three famous colleges of academic excellence.

4. Review of the Study

Ross Fuqua, a co-operative Library service, Marry Wallace Moore, Smyrna Public library, Mardi Durham, IREDELL Country Public Library, Sarah MC Donald, Oxford country Library and many others joined hand in hand and released a white paper to promote the Library services and e resources In United States of America in the year 2018 "Novelist Increasing usage of Library resources" to all the countrymen to promote and explore the resources in the Libraries. As the collection development increases Librarian feels the responsibility that they should reach to the user.

Efren Torres, De La Salle Health Sciences, had a study in order to determine the strong and weak disciplines of each library collections in Philippines in five Medical College Libraries and found that Library budget and the role of Library director in book selection were among the key factors that could contribute to a high percentage of matches in titles. His paper entitled "Condition based analysis of selected Medical Libraries in the Philippines using Doody's Core Titles," in 2017.

In the year 2007 when the electronic resources are slowly occupying the place of print journals, a case study was done by the Yale University's Collection Development and Management service Connecticut to know how they slowly transformed the activities of the electronic journals as a successful replacement as the proactive approach to satisfy the clientele in handling the electronic e resources by Daniel M.Mollar, John Gallagher, Jani Glover, Regina Kenny Marone and Cynthia Crooker.

From the above three reviews, it is crystal clear that the replacement and transformation is very much necessary as there is no option other than the e resources to follow in all fields of research and development. Collection development and management of e resources plays a vital role in the Library to increase the users wherever they may be.

In this paper three different colleges of disciplines are taken for study. The collection development and changes in the resources, services that are taken place after the digital age are considered. The following table shows the year of establishment of the college and transformation in to digital age.

Table 1 showing the year of establishment of the colleges and the use of e-resources stated

S.No	Name of the college	Year of Establishment	Area of the Library and Information Centre	Use of e resources started
01	Silver Jubilee Government College (A), (SJGC)	1972	5616sq.ft	2014
02	G.Pulla Reddy Engineering college (GPRCE)	1962	1250 sq.ft	2007
03	G.Pulla Reddy Dental college and Hospital (GPRDCH)	2006	5950 sq.ft	2007

5. Methodology

In the first category the users are students who pursue their graduation with specialization inf Mathematics and allied sciences, Bio stream and Arts stream with B.A. and B.com (CA). Post Graduate students with Telugu, Economics. Physics, Commerce and English as main subjects.

In GPREC the students belong to Engineering with specialization in Mechanical, Civil, Electronics and Computer science.

In GPRDCH the students belong to the Dental science with specialization in Pedodontics, Oral Pathology, Community science, Endodontic, human anatomy, micro biology, histology, general and dental pharmacology, Periodontics, physiology and biochemistry Prosthodontics and dental material etc.

6. Method of Data Collection:

A questionnaire is designed for the Library users and is distributed on experimental basis at Silver Jubilee Government College (A) first. After a pilot study, again some modifications were done to the questionnaire in a structured manner and

are distributed in G.Pulla Reddy Engineering College and G.Pullareddy Dental College & Hospital. The results are used for the data analysis. The incomplete questionnaires are not taken into consideration for data analysis.

The collected data is analyzed with simple percentage and comparison between the three colleges. The user‘s response is as follows:

Table 2 showing Number of samples taken for study

S.No	Name of the College	Questionnaires distributed	Questionnaires received	% of the response
01	SJGC (A), Kurnool.A.P.	83	59	71.08%
02	GPREC ,Kurnool A.P.	112	67	59.82%
03	GPRDCH,Kurnool,A.P.	78	42	53.84%
	TOTAL	273	168	61.538%

From the above table it is known that the responding sample is of 61.53% which is qualitative enough to continue the study.

7. Objectives of the Study

The collection development in the academic libraries is one of the important aspects to be taken care of depending upon the stakeholders and the output of the Organization. The most important criteria are the finance and the needs to be looked and provided to the students and staff.

1. To study the Collection development in the three colleges from the date of establishment
2. To Know the user’s dependence on the e –resources
3. To compare the services before and after the automation in the Libraries
4. To study the infrastructure available and the user’s opinion.
5. To know the user’s satisfaction regarding the services available in the Libraries.

1. Collection development in the college Libraries from the date of establishment:

Table 3 showing transformation is done in collection development

Category of Collection	Name of the college	1975—1990	1991-2005	2006-2020
Books	SJGC(A)	3323-12252 (8829)	12553-21647 (9395)	21648-26234 (4587)
Do	GPREC	1-29963 (29963)	29964-39604 (9640)	39605- 59964 (20359)
Do	GPRDCH	---	---	0-2545
E-Resources	SJGC(A)	----	----	3 cores+ Open sources
Do	GPREC	----	----	3.5 cores+ Open sources
Do	GPRDCH	---	---	151

There was a time in the field of Library and Information Centre that Collection Development was given the prime importance. The technological development made the publishers and authors to publish and write in electronic form. The change came slowly in approach of the users to have information at their desktop around the clock. Automation of the Libraries started and purchase of computers and the internet came into existence. This change had influence on the collection development.

From the above table it is learnt that after the year 2005 the change in the Collection started. The book form changed to e resources and it has out reached the book form in all the three colleges irrespective of their disciplines. The print journals are replaced by the electronic forms and without them there is no research and development.

2. User's dependence on e –resources:

Depending on the type of colleges, the users and their needs and their collection development is also different. But the dependence on e resources is so much that a small seminar or project is not complete and will not have effect unless the citations are done from the standard website.

Table 4 showing the Users dependence on e –resources Percentage is shown in parenthesis

S.No	Name of the College	Very useful	Not useful	satisfied
01	Silver Jubilee Government College (A),Kurnool (SJGC) N=59	32(54.23%)	07 (11.86%)	20(33.89%)
02	G.Pulla Reddy Engineering College,Kurnnol (GPREC) N=67	49(73.13%)	09(13.43%)	09(13.43%)
03	G.Pulla Reddy Dental college and Hospital (GPRDCH)) N=42	18(42.85%)	10(23.80%)	14(33. 33%)
	Total	99(58.92%)	26(15.47%)	43(25.59%)

From the above table it is known that 54.23% of the users are having the opinion that the e resources are very useful there as 11.86% have the opinion that they are not useful. In GPREC 73.13% are having the opinion that the e resources are very useful. On the whole 58.92% of the users are having the opinion that e resources are very useful to them and 25.59% of them are satisfied and 15.47% are having the opinion that the e resources are of not use to them.

3. Services before and after the automation in the College Libraries:

To maintain the library's position as a valued source of information, all librarians must evolve rapidly changing user expectations and to prevent the marginalization that comes from failing to stay in touch.

"The future library of the library is that there is no library; the functions that the library performs have been blown up and are scattered throughout the Universe." –Leigh Watson Healy, Outsell Inc.

Table 5 showing services before and after automation

Name of college	Before automation	After automation	Remarks	Specification
SJGC(A)	Circulation Periodical Reference Book Bank	E-library OPAC Newspaper clipping Internet	Reprographic services available Up to the year 2005-06.	Going to Introduce RFID in future.
GPREC	Circulation Periodical Reference Book Bank	E-library OPAC Newspaper clipping Internet	----	Going to Introduce RFID in future
GPRDCH	Circulation Periodical Reference	E-library OPAC Newspaper clipping Internet Book Bank	----	----

Table 6 showing the infrastructure and users opinion

Name of college	Reading room			No. of computer			Reprographic Sections			Competitive section		
	*S	*NS	*FG	S	NS	FG	S	NS	FG	S	NS	FG
SJGC N=59	48 (8135%)	2 (3.3)	9 (15.25%)	22 (37.28%)	32 (54.3%)	05 (8.47%)	---	---	---	46 (76.96%)	02 (3.38%)	11 (18.64%)
GPREC N=67	48 (71.64%)	7 (10.44%)	12 (17.91%)	57 (85.07%)	02 (2.98%)	08 (11.94%)	48 (71.64%)	05 (7.46%)	14 (20.89%)	39 (58.20%)	07 (10.44%)	21 (3134%)
GPRDCH N=42	22 (52.38%)	05 (11.90%)	15 (35.71%)	21 (50.00%)	04 (9.52%)	17 (40.47%)	31 (80.95%)	04 (9.52%)	07 (16.66%)	--	---	---
Total	**118 (70.23%)**	**17 (10.11%)**	**36 (21.42%)**	**100 (59.52%)**	**38 (28.61%)**	**30 (17.85%)**	**79 (72.47%)**	**09 (8.25%)**	21 (19.26%)	85 (67.46%)	9 (7.14%)	32 (25.39%)

*** The values in parenthesis show the percentage*

**S=Satisfied* *NS= Not satisfied* *FG= Feel good*

Table 7 showing users satisfaction regarding services available in the library

Name of the college	Internet Services			E -Library			OPAC			Circulation Service			Reprographic		
	S	NS	FG	S	NS	FG	S	NS	FG	S	NS	FG	S	NS	FG
SJGC(A) N=59	22 (37.29%)	16 (27.11%)	21 (35.59%)	28 (47.45%)	09 15.15%	22 37.28%	-	-	-	39 66.10%	02 3.38%	18 30.5%	-	-	-
GPRCE N=67	37 (55.22%)	11 (16.41%)	19 (28.35%)	49 (73.13%)	03 (4.47%)	15 (22.38%)	38 (56.71%)	09 (13.43%)	20 (29.85%)	48 (71.64%)	08 (11.94%)	11 (6..4%)	52 (77.61%)	07 (10.44%)	08 (11.994%)
GPRDCH N=42	21 (50.00%)	05 (11.9%)	16 (38.09%)	32 (76.19%)	04 (9.52%)	06 (14.28%)	18 (42.85%)	09 (21.43%)	15 (35.71%)	18 (42.85%)	03 (7.14%)	21 (50.0%)	29 (69.05%)	07 (16.37%)	06 (14.28%)
TOTAL	**80 (47.61%)**	**32 (19.04%)**	**56 (33.33%)**	**109 (64.88%)**	16 (9.52%)	43 (25.59%)	56 (51.37%)	18 (16.51%)	35 (32.11%)	105 (62.5%)	13 (7.74%)	50 (29.76%)	81 (74.31%)	14 (12.84%)	14 (12.84%)

**The values in parenthesis show the percentage*

S=satisfied NS= Not satisfied FG= Feel good

From the above table it is known that instead of the regular services done by the Library, the new services are added and taken over. The change is clearly because of the digital form of information and the open technology movement.

4. Infrastructure available and the user's opinion

From the above table it is learnt that 70.23% of the users are fully satisfied with the reading room facilities and 21.42% of them feel good where as 10.11% of them are not satisfied. In providing the computers 59.52% of them are fully satisfied and 72.47% of the users are satisfied with the reprographic facility and 67.46% of the users with competitive section facility. 25.39% of the users feel good with the facility of the competitive section and its atmosphere.

5 User's satisfaction regarding the services in the Library and Information Centre in three colleges:

This is the most important criterion to be taken care of the users. Today all the organizations are more inclined to prove that funds are being utilized for improved services and benefits and are shown through performance indicators.

From the above table it is understood that 74.31% of users feel reprographic services, 62.5% of users feel circulation services and 64.88% of e library services are more satisfied than the other services like OPAC and Internet services. Though the e library services are interdependent on the Internet services users has given their opinion that e library services are more satisfactory.

8. FINDINGS AND SUGGESTIONS:

- It is found that the Silver jubilee Government College (A), collection development was slowly increased up to 2005 and there was a decline in collection of hard copies where as the e –resources are increased enormously within 2006-2020 whereas in GPRCE there is a continuous growth in collection development. GPRCDH started in the year 2006 they have collection development in a nominal way.
- The College Libraries had taken interest in converting the traditional to Digital form of e resources in an efficient manner from the year 2014 in SJGC, 2012 in GPRCE and in 2007 in GPRCDH. They adept the technology accordingly in the libraries.

- It is learnt that before automation there were a few traditional services and after automation and e-library the services are added like internet services, OPAC etc.
- AICTE, NBA, NAAC, NIRF etc. will make the Libraries to undergo changes and it reflects in the development of the organization.
- Staff and students should be aware of the e resources available and they should be given hands on training whenever the new batch of students get admission. In the final year as they have to prepare projects they will be given information literacy training.
- 19.04% of the users expressed their dissatisfaction on the Internet services. So, speed and bandwidth, new technological developments are to be taken care of along with the training of the Library personnel.
- 70.23% of the users are using the periodical services and 72.47% of the users are utilizing reprographic services.
- 67.46% of the users are satisfied with competitive section services.
- Whenever the change in curriculum/syllabi changes the Librarian should also be given equal importance to act and react.
- Selection, evaluation, quality subject covering ,license agreement, accessibility, preservation ,weeding and safe storage all these should be taken care of for e resources..
- Open sources e-resources are very useful and are acting as an alternative source to the commercial
- Perpetual access is essential ever for the e-journals

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A Study of World Wide Open Access Movement in the Aspect of Digital Library Revolution in Modern Era

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Abstract: Open Access can be a broad international movement seeking to provide free and open online access to educational information such as publications and information. A publication is said to be "open access" when there are no financial, legal, or technical barriers to accessing it — mentioning this as soon as someone scans, downloads, copies, distributes, prints, searches and searches the data, or in education, or used in other ways within the legal agreements. This article briefly introduces the philosophy, and describes global digital library initiatives to provide open access to academic analysis. This paper discusses the recent developments in technologies that can make it possible to create digital libraries that allow better access to and better dissemination of libraries information.

Keywords: Open Access, Digital Library, open access movement, open access initiative, India, Worldwide.

1. Introduction

Open Access has Appeared As an alternative model of scientific publishing, essentially in response to the phenomenon of the "serial crisis", which has resulted from an exponential and sustained increase in subscription costs for scientific journals as well as the advent of the Internet and the spread of Obtaining resources, developing new e-publishing models and developing open standards and protocols. The Open Access movement, which was primarily born to break the monopoly of science, technology, engineering and medicine (STEM) publishers, is proving to be an inventive form of scientific communication Open Access publications affords one great contribution to digital library collections and digital library technology. With several commercial publishers committing to open access to numerous their journals and numerous open access publishing initiatives, the presence of open access publications is increasing, leading to the realization of the idea of a digital library Access to publication through various open channels (Tsakonas 2008).

Open access provides universal access to public funded analysis publications, profound works, cognitive content and documentary heritage collections through institutional repositories and open access journals. Institutional repositories and open access journals are two primary routes to produce open access to

academic literature. whereas the institutional repositories are usually originated by analysis establishments, universities and alternative organizations wherever in institution's publications, as well as pre-prints and post-prints of journal articles, analysis reports, conference papers, theses, dissertations, seminar shows, annual reports and alternative publications are deposited by researchers and workers members of the institute. These publications are created out there in open access to the educational community world-wide. The open access journals create their articles freely accessible to the user with none subscription fee. However, the fees for business enterprise a piece of writing are usually charged from the authors, their establishments or sponsoring organizations. The Content out there in open access journals and institutional repositories will usually be used freely for a production and distribution. There are not any legal or technical barriers for more distribution of the content.

2. Objectives of the Study

The objectives of this paper are to discuss and impart information on the subsequent aspects of Open access and digital library:

- Introduce and outline the conception of digital library and open access publishing;
- Introduces the philosophy of open access and its association with digital library;
- Defines characteristics of open access;
- Strategies of publication open access research;
- Catalyst to the open access movement and major open access declarations;
- Describes world-wide open access digital library initiatives;
- Open access and copyright
- Discusses recent developments in digital library technologies

3. Literature Review

As information professionals, librarians are often vocal and active advocates of open access. These librarians believe that open access promises to remove both the price barriers and the permission barriers that undermine library efforts to provide access to the scholarly record, (Peter, 2003) as well as helping to address

the serials crisis. Many library associations have either signed major open access declarations, or created their own. For example, IFLA have produced a Statement on Open Access (IFLA, 2011). At most universities, the library manages the institutional repository, which provides free access to scholarly work by the university's faculty. The Canadian Association of Research Libraries has a program to develop institutional repositories at all Canadian university libraries (CARL, 2013).

4. Digital Library

Clifford lynch (1995), a well-known digital library and new technology professional, described the digital library as "the digital library can be a system that provides a community of users with consistent access to an oversized and organized repository of information and the digital library is not a single entity, but multiple sources are seamlessly integrated. »Regional digital library unit organizations that provide resources, along with specialist staff, to select, structure, provide intellectual access, interpret, distribute, maintain the integrity and ensure the persistence over time of digital works collections in order to that they are pronto and economically available for use by a defined community or set of communities

5. Open Access

Open Access: Open Access (OA) means free access to data and unlimited use of electronic resources for everyone. The content is OA, from text and information to software packages, audio, video and multimedia. While most of these are only associated with text, an increasing range is embedding text with images, data, and workable code. OA can apply to non-academic content, such as music, movies and novels.

A publication is considered in Open Access if

- Its content is universally and freely accessible, without price to the reader, via the web or otherwise;
- The author or owner of the copyright irrevocably grants all or some users, for an unlimited amount, the right to use, copy or distribute the article, provided that the correct attribution is given;

- It is deposited, directly, completely and in a very appropriate electronic type, in a minimum of a large and internationally recognized open access repository committed to.

Characteristics of Open Access

Relative characteristics open access is the following:

1. Pay to publish, not access. the price of publication and distribution of the articles is borne by the scholarship producers (authors or institutions), or funding bodies, rather than by users / readers;
2. Access to open access publishing is Web-based open access archives are accessible to all;
3. The author rather than the publisher owns the copyright within the users are granted permission to read, download, copy, share, etc. Authors may choose to block industrial reuse of content; Open access journals, like ancient journals, conduct criticism of the articles presented; and
4. Most publishers of open-access journals non-profit area (e.g. library of Science or PLoS) while a number of for-profit area units (eg. BioMed Central or BMC).

6. Open Access and Digital Libraries

Open Access Publishing is viewed as part of the universal digital library system, which is made up of Open Access journals and institutional repositories distributed across research institutions and universities around the world. Metadata (bibliographic information) the index services (so-called service providers or specialized search engines such as ARC, OAISTER, Google Scholar, etc.) are harvested from each of these distributed IRs as well as OA journals. So as to ensure uniform and structured access to digital content distributed in OA and IR journals all over the world. Thanks to the interoperability built into the OAI-compliant IR software and open access journal publishing system (e.g. OJS), individual institutions can participate in the process of building a distributed global digital library through their repositories and IR are also related to the concept of digital library as IR have the same functions and services that a digital library offers, i.e. collecting, storing, classifying, cataloguing, preserving and providing access to digital content.

7. Major Open Access Declarations

Three major international statements made on open access are: i) The Budapest Open Access Initiative Statement in the Meeting of the Open Society in 2002, ii) The Bethesda Statement on Open Access Publishing in 2003, and iii) The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities in October 2003. Other major statements, declaration or commitment of open access made by several societies, national and international institutions, universities, library associations and other organizations are as follows:

1. ACRL Principles and Strategies for the Reform of Scholarly Communication, August 2003
2. Australian Group of Eight Statement on open access to scholarly information, May 2004
3. OECD Declaration on Access to Research Data from Public Funding, January 2004; (Signed by more than thirty nations)
4. UN World Summit on the Information Society Declaration of Principles and Plan of Action, December 2003
5. The Washington DC Principles for Free Access to Science, March 2004
6. Welcome Trust Position Statement on Open Access, October 2003.
7. Alhambra Declaration on OA. Policies for the development of OA in South European Countries, May 2010
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9. Ghent Declaration, February 2011
10. LERU Roadmap towards OA. Advice Paper, June 2011
11. SPARC Europe Statement on Open Access for EC Public Hearing on Access to and Preservation of Scientific Information, Luxembourg, May 2011
12. The Joint Declaration on Open Science for the 21st Century from ALLEA, April 2012
13. The Paris OER (Open Educational Resources) Declaration from UNESCO World OER Congress, June 2012.

14. ERCIM Statement on Open Access (European Research Consortium for Informatics and Mathematics).
15. NKC Statements on Open Access (National Knowledge Commission, India).

8. Major Open Access Initiatives

Major open access initiatives taken world over are as follows.

Open Access Journals

Open-access journals are considered as golden route for providing access to peer-reviewed literature in electronic format free of charge without any restrictions of access over the Web. Major open journals initiatives are as follows:

International open access journals Initiatives with URL	No. of Journals
BioMed Central , http://www.biomedcentral.com/	258
PubMed Central, http://www.ncbi.nlm.nih.gov/pubmed	1445+
PLoS, http://www.plos.org/ 7	7
Bioline International, http://www.bioline.org.br/	36
Indian open access journal Initiatives with URL	
Indian Academy of Science, http://www.ias.ac.in/	11
Indian National Science Academy, http://www.insa.ac.in/	4
The National Academy of Science, India, http://www.nasi.org.in/abst.htm	3
MedIND, http://medind.nic.in/	66
NISCAIR Research Journals, http://www.niscair.res.in/sciencecommuni cation/researchjournals/rejour/rejour1.htm	17
Indianjournals.com, http://www.indianjournals.com/ijor.aspx?target=open_ access_publications_list	10
Medknow Publications, http://www.medknow.com/	41
OJAS@INFLIBNET Centre, http://www.inflibnet.ac.in/ojs/	14

Directories of Open Access Journals

Initiatives with URL	No. of Journals
Directory of Open AccessJournals, http://www.doaj.org/	9744

Institutional Repositories (IR)

Institutional repositories are a web-based archive of scholarly material designed to organize and provide seamless access to scholarly publications produced by faculty or researchers of an institution in all subject disciplines. It is also define as institution-based digital-asset management system. Institutional Repository is a cost-effective and immediate route to provide access to scholarly literature such as research papers and electronic versions of documents, theses and dissertations as well as digital assets generated by an institution such as annual reports, course notes, or learning objects, etc. There are total 3594 world-wide repositories indexed by Registry of Open Access Repositories (ROAR) which includes 99 repositories in India. Directory of Open Access Repositories has indexed total 2500 world-wide repositories, including 62 Indian repositories. Top five world-wide and repositories in India, indexed in webometrics, are as follow.

Institutional Repositories-World with URL (Source: **http://repositories.webometrics.info/**)

1. Arxiv.org e-Print Archive, http://arxiv.org/
2. Social Science Research Network, http://ssrn.com/en/
3. Smithsonian/NASA Astrophysics Data System, http://adsabs.harvard.edu/
4. Europe PubMed Central , http://europepmc.org/
5. Research Papers in Economics http://repec.org/
6. CiteSeerX , http://citeseerx.ist.psu.edu/index
7. HAL Institute National de Recherche en Informatique et en Automatique Archive Ouverte http://hal.inria.fr/
8. University of California eScholarship Repository http://escholarship.org/
9. CERN Document Server http://cds.cern.ch/
10. Virginia Tech University Digital Library and Archives http://scholar.lib.vt.edu/

Institutional Repositories- India with URL (Source: http://repositories.webometrics.info/)

1. Open Access Repository Publications of Fellows of the Indian Academy of Sciences, http://repository.ias.ac.in/
2. Indian Institute of Science Bangalore Institutional Repository http://

eprints.iisc.ernet.in/

3. Central Marine Fisheries Research Institute Institutional Repository, http://eprints.cmfri.org.in/
4. National Institute of Oceanography India Digital Repository, http://drs.nio.org/drs/index.jsp
5. Information and Library Network Centre Institutional Repository http://ir.inflibnet.ac.in/
6. National Institute of Technology Rourkela eThesis http://ethesis.nitrkl.ac.in/
7. OpenMed National Informatics Centre India http://openmed.nic.in/
8. International Crops Research Institute for the Semi- Arid Tropics Open Access Repository http://oar.icrisat.org/
9. Indian Institute of Astrophysics Institutional Repository http://prints.iiap.res.in/
10. National Aerospace Laboratories Institutional Repository http://nal-ir.nal.res.in/

Electronic Books

An Ebook is an electronic version of a printed book which can be read on a computer or a specifically designed handheld device. Major open access electronic books initiatives are as follows:

Name of International E-book Resources	No. Of E-books
Project Gutenberg	60,000+
HathiTrust Digital Library	6,557,220
OAPEN	11313
Name of Indian E-book Resources with URL	
Digital Library of India	4,58,25,715

Directory of Ebooks

Name of E-book Resources with URL	No. Of E-books
Directory of Open Access Books	34038

Open Courseware

Open Courseware is the name given to open educational resources that are presented in course format, often including course planning materials, such as syllabi and course calendars, along with content, such as textbooks, lectures, presentations, notes and simulations. Open Educational Resources are materials developed by experienced educators that are available for use, repurposing, and modification, in whole or in part, by everyone, everywhere in the world. Major open courseware initiatives are as follows:

International Open Courseware Initiatives	Established
Open Yale Courseware	2007
MIT Open Courseware	2002
U-Now	2011
Open Courseware Consortium	1990s
Coursera	2012
Udacity	2011
Indian open courseware Initiatives	
ePG Pathshala	2015
NPTEL	2003
e-Gyankosh	2005
Learning Object Repository CEC	1993

Metadata Harvesting Services

Harvesting refers to the activity of searching and collecting metadata from Open Archives Initiative (OAI) Institutional Repositories and OAI journals whose content is indexed and posted for open use from a World Wide Web server. A metadata harvesting service harvests or indexes metadata from open access initiative (OAI) compliant archives or repositories or journals through harvesting software that supports a protocol known as the Open Access Initiative Protocol for Metadata Harvesting (OAI-PMH) Major metadata harvesting service providers are as follows:

1. Google Scholar http://scholar.google.co.in/
2. OaISTER http://www.oclc.org/oaister
3. OARiNZ http://akoaotearoa.ac.nz/mi/project/te-panetakiao/resources/pages/open-access-repositories-nzoarinz
4. NCSTRL http://www.ncstrl.org/

Indian Initiatives

1. Search Digital Libraries http://drtc.isibang.ac.in/sdl
2. MetaMED http://indmeddb.nic.in/metamed.html
3. Open Index Initiative http://oii.igidr.ac.in

9. Copyright and Open Access

Copyright has been called "the most irritating barrier to the development of digital libraries" (Chepesuik, 1997). It is the main problem faced by authors, editors and readers of open access publications. Work published in open access journals may be made available to the public under the Creative Commons Attribution License. CCAL entitles authors to retain their copyright ownership for their article. Users can download, reuse, reprint, modify, distribute and copy the article as long as the original authors and source are credited. Readers are also free to make commercial use of the works provided that the user gives credit to them original author. This extensive license was developed to facilitate free use of original works.

10. Cloud Computing and Open Access Digital Libraries

Cloud Computing refers to both applications provided as services on the Internet and system hardware and software in data centres that pro saw those services. (Armbrust et al 2009). Digital libraries based on a cloud computing architecture can facilitate the shared use of computing and networking resources; it is not necessary for individual institutions to make large investments to set up the ICT infrastructure in order to set up repositories Open access cloud repository service, linking with other specific cloud research and content services, provides better access to research and scientific literature, and the cost of services digital open access library can be reduced by amortizing the overall cost of building data centres for institutional repositories economic and environmental sustainability of open access resources and institutional repositories

11. Conclusion

Open access began to be required and provided worldwide by researchers once the likelihood itself was opened by the appearance of net and also the World Wide internet. The momentum was more enlarged by a growing movement for tutorial journal commercial enterprise reform, and with it gold and library OA. a noticeable advantage of open access journals is that the free access to scientific papers despite

affiliation with a subscribing library and improved access for the overall public; this is often very true in developing countries. As data professionals, librarians square measure typically vocal and active advocates of open access. These librarians believe that open access guarantees to get rid of each the value barriers and also the permission barriers that undermine library efforts to produce access to the scholarly record, further as serving to to deal with the serials crisis. several library associations have either signed major open access declarations, or created their own. as an example, IFLA have created a statement on Open Access.

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Content Management in Libraries

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Abstract: Digital library is a collection of documents in an organized electronic form, which is available on the Internet or on disks. Synonymously, Digital Libraries are also called as Electronic and virtual libraries.

The linkage between the many digital libraries and information services are transparent to the last users; Universal access to digital libraries and information services & providing free services is the goal of using the content management in the Digital Libraries. This paper speaks about the Content Management system in the modern Libraries.

1. Introduction

The rapid development of information technology, especially in the area of digitization and digital libraries the content management system plays very effective role. Innovation in the technical field, and tools development is the first step of digital library research, this is a normal path of growth. The Vision of the libraries of the future, however, points to a role of helping to transform and transparent access to the society in all aspects of life.

Libraries are giving many contributions to the development of many kinds of digital repositories including new digital objects or digitized versions of locality created works.

The features of a Content Management System is the bulk in volume, but most include Web based indexing, format management, revision control mechanism, and publishing, search and retrieval.

A content management system is a system used to manage the content in the Website, a CMS consist of two visions; the content management application (CMA) and the content delivery application (CDA).

The CMS element allows the content manager, who may not know hyper text Markup Languages to manage the modification, creation and removal of content from a Website without need of the experts in such a field. The CDA element uses and complies that information to only update the Website.

A content management system(CMS) such as a document management system(DMS)is a computer application used to manage workflow which one needed to collaboratively create, index, review, search, archive and publish various kinds of digital media and electronic text. Content Management Systems provides support for integrated indexing and search functionaries. By category of metadata it is possible to fine-tune desired search results and ensure that type can easily find what they want.

As said above the Content Management has many forms, For example; Enterprise Content Management System, Web Content Management System, Document Management System, Mobile Content Management System, Component Content Management System, Media Content Management System, This paper will discuss the above topics in depth.

2. Enterprise Conent Management System

As the bulk and complexity by increasing the volume of the data, the demand for easy, accessing and flexible Enterprise Content Management solutions from various organizations builds as well.

Enterprise Content Management is the technology used to Manage, Capture, Deliver, Preserve, and Store the content and documents related to organizational process. AIIM changed its original definition to; Enterprise Content Management is the strategies, methods and tools used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. EMC tools and strategies allow the management of organizations unstructured information, wherever that information exists. It also having all of the additional problems involved in converting to and from digital content, to and from the traditional media of those problem domains such as manual and computerized filing systems, and also involving paper and microforms.

The content and body of today's outward directed web be the basic platform for tomorrow's internal information system in Digital Libraries.

Benefits of ECMS

- Reducing the paper handling and error correction manual process
- Reducing the paper storage
- Reducing the loss of documents
- Speedy access to information

- Online access that was formerly available only on microfilm and paper
- Improved control over documents and document oriented process
- Reducing of time consuming business processes
- Security over the document access and modification
- Providing reliably and accurately audit trail
- It improved tracking and the monitoring to improve efficiency of Digital Libraries.

Components of an enterprise content management system

ECM systems which include a wide variety of technologies and components, some of which can also be used as the pillar stone systems without being incorporated into an enterprise wide system.

The five Component and technologies of the EMC model were defined as Follows;

- Capture
- Manage
- Store
- Preserve
- Deliver

As per Wikipedia, 'The model include in the Manage category has five traditional application areas; Such as, document management, collaboration software, web content management, archive and filing management system on long term storage media and workflow process management. These 'manage' components connect capture, preserve, deliver, store and can be utilized in combination or individually. While document management, web content management, collaboration, workflow and Business process management is more dynamic part of the life cycle of Information in Digital Libraries'.

Records management will takes care of information which can be no longer be changed. The utilization of the information is paramount throughout, whether through independent user of the EMC system components, or by enabling present applications that access the functionality of ECM services and the stored information. The integration of the existing technology makes me clear that ECM is not a new category, but an integrative force of content management.

The individual categories and their work abilities will be examined on the following

categories;

Capture: this category contains functions and components for capturing, generating, processing and preparing analog and electronic information.

Manage: the Manage components are for the sake of management, processing, and utilizing the information. They adopted databases for administration and access authorizing systems.

The goal of an ECM system is to giving above two components just to services for all Manage solutions like document management, collaboration, WCM, Record Management and Workflow process management. To give the link of various Manage components, they should have secure transaction process for inter component communication.

Store: This component are used for output, here two functions are having its own importance the temporary storage of information which it is not required to archive, even if it uses media that are suitable for long term archiving. Store is still varying from Preserve. AIIM listed the 3 category of Store components; those are 'Repositories' as storage locations, 'Library Services' as administration components for repositories, and storage 'Technologies'.

Preserve: the preserve component of ECM keeps the long term, safe storage, backup of static, unchanging information and also temporary storage of information that it is not desired or required to archive. This component contains special viewers, migration tools, and long term storage media etc.

Deliver: the Deliver component of ECM are used to presenting the information from the components of Mange, Store, and Preserve. It also includes functions used to enter information transferring to media or for watching information for the Store and Preserve components.

The Deliver components comprise 3 parts of function and media: transformation technologies, security technologies, and distribution. For output, two functions are primary importance; layout with tools for laying out and formatting output, and publishing; with applications for presenting information for distribution and publication.

Web Content Management System

This is also a content management system implemented with the software as a Web application, for creating and managing HTML content. It is used to manage and control a large number of Webs material.WCM helps content creation, editing, content control and web maintenance functions.

The software gives tools designing to allow users with the small knowledge of programming languages for creating and managing the content. A web content management is a software system used to managing and controlling a large numbers of Web material. A CMS facilitates document control, auditing editing and perfect time management. Here we shall found 3 types of WMS such as,

A. Offline processing: this helps to apply the templates before publication to move the web pages. It is a pre processing system and do not required the server for applying the templates.
B. Online processing: It applies the templates when requires.Html may be used when the user visited the page. These are called nodes, modules, widgets.
C. Collaborate System: Some of t systems having the both offline and online approach. Some systems also write executable code e.g. JSP, ASP, PHP, ColdFusion, or Perl page, so the content management system itself do not need always Web servers.

This is a list of content management systems which were used to organize and facilitating collaborative content creation. Some of those are;

1. Saas (Software as Services).
2. Proprietary Licensed Software.

2 (a). NET, 2(b).ASP.NET, 2(c).Java.

2 (c1). Java bundle. 2(c2) PHP.

3. Free and open software.

3 (a). Java, 3(b)Perl.

3 (c). Java Packages/Bundle

3 (d). PHP. 3(e). File/ Flat File

3 (f). Python

3 (g). Ruby of Rails.

Document Management Systems

There are several common issues those are involved in managing documents,

whether the system is an informal, ad hoc, paper based method for one person or if it is a formal, structured, computer enhanced system for many people across multiple offices. Most methods for managing documents address the following areas:

In the era of 1980s, a number of vendors began developing system to manage paper Based documents. These systems managed paper documents, which included not only printed and published documents, but also photos, prints, etc.

Later, a second system was developed, to manage electronic documents, i.e., all those documents or files, created on computers, and often stored on local user file systems. The earliest electronic document management(EDM) systems were either developed to manage proprietary file types, or a limited number of file formats. EDM systems evolved to where the system was able to manage any type of file format that could be stored on the network. The applications grew to encompass electronic documents, collaboration tools, security, and auditing capabilities. Document management systems commonly provide storage, Versioning, metadata, security, as well as indexing and retrieval capabilities. Here is a description of these components:

Metadata: It is typically stored for each document. It literally means Data for the Data. Metadata may, for example, include the date in which the document was stored and identity of the user storing it. The DMS may also extract metadata from the document automatically or prompt the user to add metadata.

Integration: Many document management systems attempt to integrate document management directly into other applications, so that users can catch the existing documents directly from the document management system repository, and make changes, and save it in the document back to the repository as a new version, with without leaving the application.

Capture; Images of paper document using the scanners or multi functional printers, here the Optical character recognition software is regularly used, whether integrated into hardware system or as lonely stand software, in order to convert digital images to readable text.

Indexing: Indexing may be as simple as keeping track of unique document identifiers, but it takes a more complex form, providing classification through the documents metadata or even through word indexes extracted from the documents contents. Indexing exists mainly to support retrieval.

Storage: It is to store the electronic documents. Storage of the documents includes management of those same documents, where they were stored, for how long,

migration of the documents from one storage media to another and eventual document destruction.

Distribution: A published document for distribution has to be in a format that cannot be easily altered. An original copy of the document is never used for distribution other than archiving. If a document is to be distributed electronically in a regulatory environment, then the equipment tasking the job has to be quality endorsed and validated. Similarly quality endorsed electronic distribution carries have to be used.

Collaboration: It should be incorporated in EDMS. In its basic manner, a collaborative EDMS should allow documents to be retrieved and worked on by an authorized user. Access should be blocked to other users while work is being performed on the document. Other advanced forms of collaboration allow multiple users to view and modify a document at the time in collaborative session.

Security: Document security is vital in many document management applications. Compliance requirements for certain documents can be quite complex depending on the type of documents.

Workflow: Some document management systems having built in workflow method. We can find many kind of workflow. It is the usage depends on the system of electronic document management.

Versioning: It is a process by which documents are verified in or out of the document management system, it allows user to retrieve previous versions and to continue work from a selected position. Versioning is very useful for documents which require updates and changes, but it is necessary to go back to a previous copy. Indian Copy right Rule 2012 acts major role on Versioning right.

Publishing: Publishing a document sometimes involves the procedures of proofreading, peer or public reviewing, authorizing, printing and approving and other various methods. These steps ensure the logical thinking. Any irresponsible handling may results in the inaccuracy of the document and therefore it can mislead or upset its stakeholders. Refer to the ISO divisions of ICS01.140.40 and 35.240.30 the published document should be in the format which is not easily altered without the specific knowledge or tools and yet it is read-only or portable functions of DMS; Storing, Structuring, Indexing.

Document automation: Document automation acts beyond assembly of individual documents. It is the kind of system design and work frame that helps in choosing the appropriate document and the assembly of those documents by using files data that includes the entire suite of documents. It automates all the kinds of documents. Automation systems allow firms to minimize data entry or reduce the

time spent on proof –reading, and also reduce the human associated errors. It also saves the labour wastage by reducing paper handling, loading storage, postage, cost of faxes and telephone charges.

Mobile content Management: It is one of the content management systems capable of storing and delivering the content to mobile devices, such as mobile phones, smart phones, and PDAs. Mobile content delivery has unique, specific constraints including widely variable device capacities, small screen size, limited wireless bandwidth, small storage capacity, and comparatively weak device processors.

Mobile devices are increasingly important parts of the digital environment. For digital libraries the impacts are varied and widespread.

Only a few years ago, the idea of mobile content management was a novelty; today, it is main stream. The basics of the technology, such as smart phones, have been available for a number of years, but the explosion of social networking sites, easy-to-use applications for platforms, like the I Phone and Blackberry, and more mature enterprise content management solutions means that all content is more accessible than ever.

Mobile content management commonly helps in; accessing content remotely, managing content that is in the public infrastructure and capturing information while mobile.

Multi –channel Content Delivery: It allow the users to manage a central content repository while continuously delivering that content to web browsers desktop, mobile phones or other various devises. Here content is stored in basic raw format to which device specifically presents or apply in its own way.

Specialized Templating System: While traditional web content management systems handle templates for only a handful of web browsers, mobile CMS templates must be adapted to the very wide range of target devices with different capacities and limitations. There are two approaches to adapting templates: multi-client and multi-site. The multi-client approach makes it possible to see all versions of a site at the same domain (e.g. sitename.com), and templates are presented based on the device client used for viewing.

Location-based Content Delivery: Location-based content delivery provides targeted content, such as information, advertisements, maps, directions, and news, to mobile devices based on current physical location. Currently, GPS (global positioning system) navigation systems offer the most popular location-based services.

Early adopters of mobile content management systems typically used standard PC applications that were linked via wireless networks back to the centralized ECM system. Bandwidth considerations often limited the ability to transmit large amounts of information, so systems commonly used special technology to optimize the bandwidth or reduce the amount of data being transferred to the mobile PC.

The one weakness is that these systems have very little in the way of tools to manage the content, especially in the areas of records management, and this 'records management of the public infrastructure' is critical for some applications. For example, the FBI hosts a LinkedIn page that can be used for recruiting, while Clorox has a Face book page that can be used to share product information. In both cases, formal records may be produced that must be managed. Such tools are just beginning to appear, but they will be critical as the lines between private and public sources of content continue to blur.

Mobile content management is just the next logical step in content management. Just as early imaging systems broke the barriers of sharing documents in the central file room, today's mobile content management applications are letting content be managed securely outside of the traditional in-house network.

Component Content Management System: It is the method of manage the content at a component level rather than at the document level. Here each component represents a single topic, issue or concept e.g., table, product of description, image. It assembled into multiple content assemblies and it can be viewed as individual components or as traditional system of documentation.

Each component has its own life circle like, owner, approval, version and it can be tracked in individual manner or as assembled part. CCM is typically used for multi-channel customer facing content like ,marketing, usage, learning, support. CCM is a system which can be a separate form or functionality of other content management system.

Benefits of managing Content at Component Level

The benefits of component content management include: Greater consistency and accuracy (content is the same wherever it is reused), Reduced content creation and maintenance costs (there is less content to create, review and manage because content is reused), Reduced delivery costs (content is separate from format so content can be published to any channel with no reworking of the content),Reduced translation costs (content objects not documents are translated reducing the cost of matching content, and once a component is translated it is translated wherever it is reused)

It should be noted that most vendors of CCM systems don't use this term to describe their wares, making it increasingly difficult to determine which systems support CCM.

Content Managements Software's in Digital Library

Drupal: is a free software package that allows an individual or a community of users to easily publish, manage and organize a wide variety of content on a website. Tens of thousands of people and organizations have used Drupal to power scores of different web sites, including community web portals, discussion sites, corporate web sites, Intranet applications, personal web sites or blogs, E-commerce applications, resource directories, and social Networking sites. Drupal is ready to go from the moment you downloading it.

The built-in functionality, combined with dozens of freely available add-on modules, will enable features such as: Content Management Systems, blogs, collaborative authoring environments, forums, peer-to-peer networking, newsletters, podcasting, and much more and is maintained and developed by a community of thousands of users and developers. Flexi node allows you to create web forms that represent your content; you can add text fields, drop-down lists, image fields, color pickers and other interactive elements, and media specific elements such as upload tools and links to MP3 files.

Word Press: uses plug-ins, and the Open Journal Systems application is moving rapidly in that direction. However, Drupal's is probably one of the most mature module architectures out there. Morbus Iff has even written a Drupal module that uses FRBR to model bibliographic records for personal book, music, and video collections. If the existence of niche modules is a sign of a mature CMS, then this one means Drupal is mature. The prototype is not intended to compete with Fedora, Greenstone, and Street print.

CONTENTdm: or any other dedicated digital collection management system. prototype has no digital asset management or preservation functionality Drupal is a general CMS in that it powers blogs, community websites, and general websites equally well. Some examples of Drupal sites include the JPEG 2000 in Libraries and Archives site and the journal Copyright's community site. As the student who started the Drupal thread on the course website pointed out, Ann Arbor District Library uses Drupal to power its website. It is an award-winning Content Management System (CMS) that will help you build websites and other powerful online applications.

Joomla: Best of all, Joomla! is an open source solution that is freely available to everybody. Joomla! is used all over the world to power everything from simple, personal homepages to complex corporate web applications.

3. Conclusion

The development outcome of a digital library is in turn measured by a complex index termed as 'Human Development Index'. However comprehensive and accurate these measures are, these happen to be out of reach of understanding to the last user who gets left out of the process due to sheer inability to comprehend what is happening. This further disables the last user to relate to the development and participate in it. Only when the measures are simple and understandable can the people relate to access and participate in it.

Selection of the right content management system (CMS) can be challenging task, to gain the benefit by starting the projects CMS market can skip the critical situation in mad way. Content preservation and retrieval are the important issues for librarians in the network environment. Constant migration of contents in terms of storage media, technology and software tools will ensure not only the preservation of contents but also their accessibility in spite of ever changing technology.

Although lots of vendor based CMS tools are available in market, open source solutions will be of great help to Digital Librarians. Notably the open source projects like e-prints, D space, fedora play vital role in repository building & content management.

Another important dimension for the last user to participate in the content management system in the Digital Libraries is the level of trust he / she places on the implementation system. The higher the trust, the higher the participation. Lower the trust, the user chooses to keep out of participating .

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Theme-6

Abstracts

Evaluation Of Social Science Collection In Sant Gadge Baba Amravati University Library (1983 to 2013)"

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Abstract: Collection Development is an important aspect of library. The present paper discusses on the evaluation of social science collection in Sant Gadge Baba Amravati University Library 1983 to 2013. It focuses on evaluation of social science collection in S.G.B.A.U. library. Overview social sciences, Library collection, collection development, collection development policies.

1. Introduction

In the backdrop of information burst and the availability of latest technologies, the role of libraries is changing very fast. Libraries are only next in importance to school, colleges and universities as means of educating the public. A good modern library usually possesses widest possible range of literature, such as books, periodicals, magazines, etc. In the context of social sciences, this literature becomes the main feature of the library and is the chief source of information pertaining to the endeavors. achievements and glory of writers, statesmen, scientists, philosophers and saints. Besides, all the social changes occurring in local. Regional or national level are meticulously preserved through such literature collection.

Aims and Objectives of the Study

The main objective of the proposed study is to evaluate the social science collection in Sant Gadge Baba Amravati University, Amravati Library. The specific objectives are as follows

(i) To evaluate the Collection Qualitatively by using criteria.

(ii) To evaluate the Collection Quantitatively by using criteria.

(iii) To ascertain the use of collection.

(iv) To know users needs and their satisfaction levels about the collection.

Hypotheses of the study

Following are the Hypotheses of the Study.

1. Post-Graduate students in Social Science preferably use the books published in Marathi Language.

2. The preferred language by the research scholars in Social Science is English.
3. Users are satisfied with the existing collection
4. Significantly high numbers of researchers in Social Science prefer Indian Publications.
5. Collection is inversely proportional to the growth rate.

Scope and Limitations of the Study

The Study is confined to evaluation of social science collection in Sant Gadge Baba Amravati University, Amravati Library only. Social Sciences subject collection acquired upto December 2013 will only be considered.

Research Methodology

For the present study following Methods of evaluation were adopted.

1. Quantitative Method
2. Qualitative Method
3. Use Method
4. Statistical Analysis
5. Users Studies

Scope of the Study

The study was carried out with respect to the collection development in the library of Sant Gadge Baba Amravati University, Amravati. In this study only the collection pertaining to subjects covered under the faculty of Social Sciences was studied.

Research Design

The present study used a technique of descriptive research design that seeks to determine present situation pertaining collection development in the library of Sant Gadge Baba Amravati University, Amravati.

Reliability and Validity Estimation

Reliability of the instrument was assessed using the test-retest method, which allowed determining the repeatability of the instrument. The validity of a measure refers to the extent to which it measures what it was intended to measure. Three different types of validities are generally considered, which are content validity, construct validity and criterion-related validity.

Statistical Analysis of Data and Significance Level

In the present study, analysis of data was done with the help of suitable statistical tests., frequency (relative), percentage, mean, standard deviation, the 'Chi-Square' test, etc. The significance level was chosen to be 0.05 (or equivalently, 5%) by keeping in view the consequences of such an error.

Conclusion and Recommendations

Following data collection, statistical analysis was carried out and the results were interpreted in view of the study objectives. The data was collected regarding collection development utility of the collection. Services of library, etc. However, the conclusions drawn on the basis of statistical analysis of data are presented in this paper

There are five chapter which are as follows

I) Introduction and Research Methodology

II) Review of Literature

III) Collection Development in Sant Gadge Baba Amravati University Library

IV) Analysis of data and Result of the Study

V) Conclusion and Recommendation

Bibliography

Digital Preservation: Issues and Challenges in Libraries

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Abstract: The paper discusses about the various preservation problems and challenges faced by different types of digital materials to ensure permanent accessibility of resources by present and future generations. It argues that digital preservation poses challenges fundamentally different from the traditional materials mainly due to varied and complex nature of digital resources. It concludes that there is an urgent need to draw up national digital preservation frameworks to protect the current digital information resources for future access and use.

It considers the wide range of digital objects of interest to KRC, including books, dissertations, ph. d. Thesis, e-journals, technical reports, e-records, project documents, scientific data, Periodical materials, handbook, encyclopedia, CD, and DVD etc.

The present research will include themes of preservation required in digital libraries, what is preservation, need for digital preservation, objectives of digital preservation, types of medium for preservation, tools of digitization, digital preservation techniques, advantages of digital preservation and disadvantages of digital preservation etc.

Keywords: Digital Preservation, Preservation, Library, Digital Conservation

Indian librarianship in landscape of Digital Libraries –Challenges and Oppourtunites

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1. Introduction

India is vast country having historical background regarding culture and education. Since the period of Universities like Nalanda and Taxila libraries playing vital role in enriching the culture and imparting the education. Traditionally, the librarian's job has been that Custodian. But now, the concept of librarianship has given way to new dimension in it, taking the responsibility for the provision of personal assistance to the users. Librarianship as such, experts him to provide information and ideas to its readers which is possible only through the implementation of the pieces of establishing contact between a user and his document in a personal way. Role of librarian is get changed because it is now not just a library at par with an academic institution which creates, conserves and communicates knowledge, but it also makes a greater and long lasting impact upon the whole lifetime of the people it aims to serve. In this age of digital era libraries and librarianship has so many challenges and with that some opportunities.

This paper will focus on the such important points which deals with the historical preview of Indian libraries and librarianship , status of Indian librarianship, also deals with the categorization of librarianship their responsibilities , challenges and opportunities, qualities for librarianship, coping with the digital landscape with special focus on college libraries locating in rural areas of Maharashtra ,concluding with the suggestion.

Objectives -

1. To preview the Indian Librarianship
2. To examine rural college libraries of Maharashtra with Digital landscape
3. To point out the challenges and opportunities before such libraries

Scope

1. Study on Indian libraries special focus on college Libraries in rural areas of Maharashtra.

Methodology*: survey and study through available literature .*

Conclusion: *College Libraries specially in rural areas of Maharashtra are facing problem in digital era*

Suggestions : *1. Upgrading of library services*

2. Clusters of libraries

Recommendation

1. Allocation of special fund from Govt. agencies for Library development in such areas.
2. Networking such libraries for resource sharing

Laws Related to Copyright:an Indian Scenario

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Abstract: Creativity and innovation are important step of constant growth and development of any knowledge economy of a nation. There is an abundance of creative and innovative energies flowing in India. The evolution of the film and music industry; a strong and dynamic software industry; a considerably diverse handicraft and textile industry; the Indian space programmetechnology and the pioneering role of our scientists in keeping it cost effective; these are but a few examples of creativity and invention. Intellectual property rights (IPR) have become important changes in trade environment which is characterized by over all world competition. Copyright is a kind of intellectual property the importance of which has increased in recent time due to the rapid technological development. Copying is major issue all over the world and it need to analysis and examine the protection and enforcement for right of new creator, inventor and academic researcher. In this paper the Researchers will take attempt to study on the laws relating to copyrights and libraries, also focus on the challenges, issues of copyright and plagiarism.

Key Words: Laws of Copyright, library, infringement of copyright, plagiarism.

1. Introduction

God gifted a wonderful thing to human being is brain and nature bestowed him with the huge amount of physical and biological resources on the earth. With his imagination and creativity, he has been producing many arts or products for his needs, comfort and convenience. Intellectual property Right (IPR) is used for various legal entitlements which deals with the certain types of information, ideas, or other intangibles in their expressed form. The holder of this legal entitlement have various exclusive rights in relation to the subject matter of the Intellectual Property. The term intellectual property means the idea that subject matter is the product of the mind or the intellect, and that Intellectual Property rights may be protected at law in the same way as any other form of property such as tangible property . Intellectual property includes Patents, Designs, Trademarks,

copyrights, confidential information and Industrial. Patents is exclusive right to manufacture the new article invented or manufacture an article according to the invented process for a limited periods. Deign relates to the non functional appearance of a product which appeals solely to the eye. Trade mark consist of word, name, device or get-up used in relation to particular goods to indicate the source of manufacture or trade origin of the goods. Copyright is a creation of the statute. No person is entitled to copyright or any similar right in any work except those provided under Copyright Act 1957.Copyright is a multiple right consisting of a bundle of different rights in the same work. These right can be assigned or licensed either as a whole or separately. Law is a liable for social challenges. Law is responding, while answers the challenges and in the process develops itself. Copyright is an example of the relationship between law and technology.

2. Objective of the Study

1. To know the concept of copyright
2. To understand overview of copyright and case

3. Research Methodology

The study is based on secondary data. This is collected through various publication, books, internet and articles etc.

4. Conclusion

The socio-economic development of a country depends on the creativity of people and creative works can't be encouraged without effective administration of copyright laws. Creativity and innovation are the new ways of the world economy. Copyright is a serious issue for protecting IPR. There is a big market of piracy literature today. This kind of piracy has become a major threat for the author of copyright work. So there is need to create public awareness about the economic, social and cultural importance of copyright among all sections of society. Copying remains a huge problem, causing harm for inventor in lost of economic, status of brand and harming consumers get dangerous goods. The infringement is so widely spread and so it damaging legal businesses, so this businesses are in danger to collapse. This is the challenging issue to inventor and government to protect harm caused by infringement. Also today there is demand of society to make and enforce the strong and effective Copyright laws, which balance the interests of rights owners with larger public interest. An effective copyright laws lies at the core of the countries development strategies.One of the most important things

related to library Science is that, need to awareness knowledge of copyright law concern with library.In India numbers of people making copying original work of original author's for the commercial, economic and education sector because they have many reasons such as to gain money, unknown about knowledge and access to have a status and degree etc. There is lacking of implementation of laws in every education institute at proper time which effect increasing in examination and academic research field. So it is need to understand the study and analysis of ideology of human behaviors in depth and solve the problem effectively. Therefore, the knowledge about intellectual property right's and laws is must know to all people. So it is need to easily available of original work of author to all consumer in low cost and proper way, then the piracy of original work may not be happened.

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Marketing Strategies in Academic Library

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1. Introduction

Change is essential in any surroundings to exist, prosper, survie & move forword. Academic Libraries are not an exception to this .Academic Libraries are the brains of college, University or other institution, which meets the needs of information & research of its students, faculty and staff . Marketing means action of promoting and selling products or servies, including market research & advertising . Therefore for meeting the needs of new era academic Libraries need to do marketing by various methods to fulfil needs of users.

In the age of globalization and competitive world. Information is crucial factor to promote development of society. But also these technologies effect on the libraries and it turns into the digital libraries . Due to globalization with the help of ICT's internet users access information sources earily. Marketing has wider and deeper sense which expand the organization succesive activenets. We can access these digital contents earily by documents, usernames and passwords.

Objective

1. Meeting the need of user
2. Giving right information to right user at right time
3. Achieving objective of academic library
4. Decreating obstacles in the path of users and serving them.
5. Improving quality of service
6. Increasing no.of users,their selection,their expectation,their demands.
7. Promote sources
8. Attract more patrons.

Methodology

1. Investigation of user's wants, needs, demands.
2. Markets should segmented on baries of characteristics and behaviour of users.
3. Adopt and make plan & follow it.
4. Use modern techniques & strategies.
5. Avail both printed & digital version of data.
6. Focus on users needs.
7. Focus on teamworks to improve the performance.
8. Organise orientation,workshops information literacy programme for both users & staff.
9. Training of print & digital resouces of libraries.
10. Conduct book exhibition, display of new arriavals.
11. Creating & updating library by website.
12. Providing reservation services, seating, translation facility.

Scope

- for notification of new published research.
- for circulation of periodical data, awarenes services.
- for searching literature.
- for photocopying of journal articals, newpaper services. reference sevivces, indexing services, abstracting services.
- Notification about conference, seminars, workshop
- various, social media, strategies for marketing
- Library website
- U-tube
- E-Newletters
- E-mail Alerts
- Blogs
- facebook, Twitter, Remote acces to subscribed sources.

- Knowledge portal
- Rss feed
- Tutorial on various Databases, pinterest, Assist in scientific endeavors, Tumblar.

Conclusion

For the sake of users academic libraries need to do efficient & effective marketing of information products & Services. It needs various objectives, planned strategy methodology, active participation of staff & implementation of marketting proeess. Libraries to serve users by providing needed information throught various ways. Due to globalization science and Technology have made a admirable impact on all walks of life. Libraries and information centres are also no exception libraries & information centres in considered tabe an excellent trend that makes the information products and services available in many varieties. The new computer and communiction technology has brought about marvelous change in the forms and formats of various information sources. In this contents, the paper analyzes he various facets of marketing techniques in academic libraries, social medias, blogs and other inspirational as well as promotional meterials are extensively used as marketing strategies in academic libraries.

Suggestion & Recommendation

1. Should have plan, purpose, strategies
2. Identify user serve them.
3. clear the obstacles in the path of users.
4. Focus on resources, funds, technologies,staff.
5. Adopt new technology, use simple & userfriendly language, communicate better, get
   feedback.
6. Actively participate in library consourtium
7. Adopt correct marketing approach, get proper guidance adapt changes.
8. Ibcrese funds if required, re-desing curriculum if required.
9. Take consant efforts, encourage library professionals to take part in conference, seminars. workshop
10. User education for users

Challenges of Digital Libraries

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Abstract : Libraries are expanding the amount and variety of high quality information resources that are digitally available to academic and research users via the web. The term digital library refers to the natural mean of the collection of library material can include periodicals, multimedia, educational packages, encyclopedia, maps guides, music works, video- tapes of conferences, films and movies, hyperlinks to web pages, even books. This paper highlights that the entire digital library system, an overview of the digital Library.

Introduction

Digital libraries are an evolving area of research.Digital libraries may be defined as electronic information collections containing large and diverse repositories of digital objects, which can be assessed by a large number of geographically distributed users. Such repositories would exist in locations physically near or remote from the users. Digital objects include text, images, maps, sound, videos, catalogues indices, and scientific, business, and government data sets as well as hyper textual multimedia compositions of such elements, does information technology includes computer technology communication technology networking and barcode device technology etc.

Digital Library

Digital library integrate access to materials with access to tools for processing materials supports individual and community information space through functionally for selection, annotation, authoring and collaboration.

Challenges for Digital Libraries

To achieve the broad vision of enabling access to any data information, knowledge, answer, digital libraries face many challenges, among them. Searching for text, images, sound and composite objects multimedia search. Semantically enhanced search to improve retrieval fram free text and image content and to better exploit user assigned tags.

Development of Digital Library

There are thousands of digital library projects currently underway, in all sectors of the library community. These project have taken widely varying approaches, dependent on the needs of the different libraries,the sector in which they are based, and in part the definition of digital library that has been applied the technologies involved in providing digital library services should support document creation, retrieval, transfer, dissemination manipulation and management.A study of commonwealth library digital library development was conducted in 1998 to 1999, with one of its objects to determine if the model developed from the general literature on digital libraries was appropriate to digital library and development in the commonwealth library sector.

Advantages

The advantage of digital library as a means of easily and rapidly assessing books, archives and image of various types are now widely recognized by the commercial interest and public bodies like. No physical boundary round the clock availability multiple access information retrieval reservation.

Digital Collections

Sometimes this these are digitalized versions of conventional media such as text, images, music sound, recordings, specification and designs and many more as digital libraries expand the content are less often the digital equivalent of physical items and more often items that have no equivalent such has data from scientific instruments, computer programs video games and database. Metadata is data about other data.

Common categories of metadata includes descriptive metadata, search has bibliographic information.Structural metadata about formats and structures and administrative metadata, which includes rights permissions and other information that is used to manage access.

Conclusion

Digital libraries with powerful semantic support for complex searches for documents and immediate answer across system language cultural and disciplinary boundaries and for document creation and collaboration have the potential to transform how work is done by individuals and by groups and to evolve into a true information commons.

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Job Satisfaction among Library Employees: A survey

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Abstract

Purpose: The purpose of this study is to measure the level of job satisfaction among library employees working in a state agricultural university.

Sample: The Central library of Punjab Agricultural University (PAU) Ludhiana, Punjab was selected for the survey. Total employees working in the library are selected as a sample for the study.

Dimensions of Job satisfaction: The response of the respondents was collected on different dimensions of job satisfaction which were based on a literature review. The indics used in the study are; Promotion, Pay, Reading, Professional Development, Security, Working-condition, Supervision, Work, and Coworker.

Method: The study is based on a survey that was conducted by the Researcher during a personal visit to the library. A pre-determined questionnaire parted into two parts, Respondents' biographical detail and 27 statements on job satisfaction, was distributed to each employee in which respondents recorded their response on the five-Likert scale.

Analysis: The collected data was entered into the SPPP statistics software for the further analysis of data such as Minimum/Maximum response, Mean, Standard deviation, etc.

Finding: The finding of the study indicates that most of the employees were satisfied with their job, and dimensions such as co-worker, supervision, work itself, working condition are identified as the most satisfying factors among the employees.

Mobile Application Technology & It's Use in Library Services

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Abstract: The present paper elaborates the significance of mobile application technology & its use in library services. The paper also review types of mobile app, mobile app for librarian and information professionals community, highlighting specific app that are available to librarians and briefly describing the salient features of app as well as the benefits and potential drawbacks. Author trying to notes important considerations, such as security, reliability, availability and cost of which library information professionals need to aware prior to using mobile apps in their instruction. This paper also discusses the many aspects why we mobilized? And the future plans.

Keyword: Mobile App, Library App, Mobile Learning, Mobile Devices, Goals and Strategy.

Introduction

Since personal computers become available in homes and school, development in educational technology has progressed at an accelerated pace. In these days every and each information available and accessible via www. Information seeker can obtain relevance information via various search tools or information discovery tools. In 2010 The International Telecommunication Union (ITU) estimated that more than 5 billion mobile subscriptions would exist worldwide, which more than tripled home Internet access. ITU also predicts Web access from mobile devices will exceed access from desktop computers within the next five years.

Objective

Mobile communication enables libraries to offer location based services /content through global positioning system (GPS) capabilities. Libraries can guide the users to the location of specific document or service through map and navigational tools.

Methodology

Mobile phone applications are potential learning and research infrastructure that can be used by libraries, library users and other researchers for information

search and retrieval. It is also a veritable tool that could be used to access library resources and service

Conclusion

In this paper we have concluded the mobile app and features of a mobile app with its advantages to library professionals and also for user community. The article also concluded the several mobile apps which are available for library professionals.

Suggestions

Mobile Phones are inevitable tools of ICT .Application of mobile to provide library and information service will open new pathway towards this trend. This can be an astonishing means to outreach the users, enabling them to access library resources and services from anywhere any time even when they are on move.

Digital Library: Recent trend in Indian Academic libraries

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Introduction

This paper talks about the modernexercises, strategies and innovationutilized in digitization and arrangement of advanced libraries. It set out a few key points included and the point by point plans required within thepaper, offers pieces of counsel and direction for the practicing Custodians and Information researchers. Computerized Libraries are being madenowadays for diverse communities and in numerousareas e.g. instruction, science, culture, improvement, wellbeing, administration and so on. With the availability of a few free computerized Library computer programbundles at the recent time, the creation and sharing of data through the advanced library collections has gotten to be an alluring and doablerecommendation for library and dataexperts around the world. Library mechanization has made a differenceto supplysimpleget to collections through utilize of computerized library catalogue such as On-line Open Access Catalog (OPAC).

Keywords: Digital library, Education, Computerization

Objectives of the Study

- To assess and evaluate the national-level digitization and advanced library ventures in India;
- To assess and survey the national-level ventures in India pointing at open get toinformation and academicwriting;
- To assess and evaluate the digitization ventures for distinctivesorts of collections such as uncommon books, original copies, diary articles, narrativelegacy, theses and theses;
- To ponderfundamentally the collaboration designs in digitization ventures in India countingspecialized and money related collaborations

Scope of the Study

This investigate work points at creating State of the Craftsmanship Report within therisingrange based on exploratory investigatestrategy. The objective of exploratory inquire about is to accumulatepreparatorydata that will offer assistancecharacterizeissues and recommendtheories. Given its principal nature, exploratory inquire aboutfrequently does not require any speculation.

Methodology

For this research work the various secondary sources has been used to collect the required data. The investigator was included in survey of writing with uncommoncenter on national and worldwideapproachdisobedient, digitization guidelines, digitization rules, best hones, nation reports, regulation reports etc.

Findings

Digital Library of India is the biggest digitization activity in India spreading over states of India and including over ninety organizations to guaranteea few thousands of uncommon books composed in Indian dialects as well as non-Indian dialects are open through Web channel. Fundamentallyassessesdiverseangles of the DLI extend such as collaboration design, digitization forms, metadata hones, datarecovery, etc.

Conclusion

Digitization of library materials has rapidlyended up common hone in aextraordinarynumerousteach. It gives an amazing opportunity to broadlyspread our narrative heritages and significantlyincrementsget toto library collections of uncommonreports as well as current investigatewriting. Computerized Library of India has digitized numeroustrulyimperativearchives and those are presentlyaccessible in DLI entries. Numerousanalysts and researchershave to becounselancientwriting for their progressedponders.

Recommendations

The maintainability of the Indian digitization activities is the major concern for numerousexperts. Long term supportability of any dataframework is supplemented by inventivehones, visionary administration and business enterprise

capabilities of people as well as organizations. Hence, authoritycharacteristics and imaginativehones can be measured in a comparative ponderwhich willoffer assistance in lifting national capacities and capabilities.

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Learning Management System using Google Classroom

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Abstract: In the existing day, there is high demand on e learning education. Availability of resources is most important component of human life. During the pandemic situation students teachers are getting in trouble. Academic sector have being focusing strongly on e-learning- centred and research –centred service today. Google classroom showed the right path to information hunter. They explore their knowledge and get mental satisfaction to serve the nation. The main objectives of the study were to know the application, their features, advantages, disadvantages etc. In this paper information are collected from various sources, research report, websites scientific book etc. This paper concludes that the educational institution must use this application because it is free for all.

Keywords: E-Learning, Learning Management System, Google Classroom.

The Concept of Digital Curation: Growth& Trends in Technological Developments

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A Short Summary for Article Presentation at Conference

Digital Curation is an intellectual activity for capturing information from various different sources as relevant content. In this article, we are going through the process of: Digital Preservation for future use and re-use, Data Curator,Information Retrieval, Digital curation life-cycle, Content Curation Tools and likewise things.

The objective of the paper is to define the way by how we can manage the data deluge with the help of 'Data Curation'.

In present decade, to meet the growing demand of data, knowledge management is as necessary as digitization of information.Digital curation reduces the risk ofduplicity, self-plagiarismand losing authenticity in this data flood.

Furthermore, the paper describes challenges and initiatives with examples of data curation centres around the world through different tools and techniques like social media as recent trend of smart technology or through any other mode.

Scientometrics: Recent Trend In Lis

Ms. Dinesh Kumari
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Introduction

Quantify measurement has become an established method of doing research and informing results with the help of certain generalized statistical methods and often subject specific specialized and novel areas based on statistical approaches. The community of librarianship and professionals of librarianship, information, professionals and documentationist have exhivited specialized skills of mixed nature of statistics which are popularly called Bibliometrics. Further synonyms with and interchangeably used as scientometrics,infometrics, informatics and webometrics.Scientometrics as a term was first defined and suggested in 1969 by two Russian scholars, namely, Nalimov and Mulchinko, accordingly, scientometrics is a complex of quantitative methods that are used to investigate and study science's process. The term 'Scientometrics' is a field which consists of the quantitative methods applied to the study of science as an information process. It is a scientific discipline, which performs reproducible measurements of scientific activity, and reveals its objective quantitative regularities. Further, Scientometric methods include statistical and thesaurus methods, and indicators as to the number of citations, terms etc.Scientometricshas typically been defined as the "quantitative study of science and technology".

Objectives

Over the past decade, the term scientometrics has exhibited a dramatic increase in frequency of use in publications in social sciences. This paper aims to explore the scope of scientometrics, an overview of scientometric in terms of emergence, definition and rationale/usefulness of scientometrics in the present era.

Scope

The techniques of scientometrics have extensive applications equally in sociological studies of science, information management, librarianship, history of science including science policy, study of science and scientists and also in different branches of social sciences. This paper provides a brief summary of scientometric particularly its usefulness in different aspects.This study provides a basis for scientometrics in field of library science

Methodology

The study adopted theoretical methodology to provide an overview of the scientometrics and its implications in library science**.**

Conclusion

Now-a-days these specialized methods scientometrics has become a proven technique in arriving the research result. Of sometimes, now these methods with interchangeably replacements have helped in doing doctoral research in both Indian and Foreign universities, especially by the library and information science professionals. Bibliometric studies (inclusive of scientometrics, Info metrics and webometrics) help in the analysis of R&D trends in identifying areas that are most active and those which are becoming important; identifying the influences and cross fertilizations. The studies are also useful to the policy makers who are deciding the priority areas in certain domains.

Suggestion/Recommendations

Infact, a bibliometric environment encourages awareness of thinking, planning a sharing platform of citation and research among the teaching faculty, students, library media specialists and researchers of many field. scientometric studies may help governments and private sectors, identify their competitive edges, make strategic plans for future research areas and allocate research funding to key research areas .In the creation of a bibliometric environment, faculty members and researchers who cite many works, may monitor and apply their knowledge deliberately modeling bibliometric methods to assist them in becoming aware of problem solving and research activities in all subjects.

Roe of Mobile Apps in Transforming the Education System

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Abstract: The article emphasizes that education is a human right with immense power to transform. The freedom, democracy, and sustainable human development are the cornerstones of education. As technology is establishing its roots deeper into the education sector, things are changing dramatically and one such change has been introduced in the form of education-based mobile applications. Paper stresses that mobile learning (mLearning) has also overcome educational problems of learners through interactive and personalized learning based on mobile apps. These education-based users friendly apps provide convenience to learners by helping them to achieve more in less time during the times of need. Mobile eLearners naturally study for 40 minutes longer than students using a desktop or tablet. Paper talks about latest Mobile Technology Trends that Will Shape The EdTech Sector, e.g. Artificial Intelligence (AI), Chatbots, Virtual Reality (VR) and Gamification have huge impact on both education and mobile app development niches. AI technology embraces one of the biggest benefits, i.e. personalization in the education sector. With the use of AI, the schools will be able to create a global classroom. Chatbots will give a boost to online education. Chatbots do not merely provide a personalized learning environment, but it turns lectures not only into chat conversations but also into a series of messages. Virtual Reality is the next hyped mobile technology trend which has taken the learning process beyond the learning space, and provides real-world experiences especially to medical students. Further, Gamification (i.e. learning with fun) can results in more and better student engagement. The paper also discusses few Innovative Education Apps, such as i) Remind, ii) Photomath, and iii) Duolingo, etc which provided prevailing solutions to learners such as systematic and smart learning; enhanced interaction; bridging the gaps between parents and teachers; tracking students' progress; providing eBooks and online study materials; ensuring 24x7 availability of materials; and also promoting self-learning in the traditional education system. The article also defines and describes that e-Learning is the use of any electronic media in learning and teaching, which covers a wide set of applications and processes. E-learning is being implemented more and more frequently in higher education, creating new opportunities for both educational institutions and students.E-learning can also prove beneficial for professionals who can't devote full time to the conventional methods of learning. The students can learn all by themselves and independently anytime from anywhere with the assistance of helpful sources like: videos, graphics, Apps, documents, quizzes, reports, as guidance to their coursework that enables a complete in-depth understanding of concepts. Further, ICTs also allow for the creation of digital resources like digital libraries where students, teachers and professionals can access any types of research material and course material from any place and at any time. The web and the Internet is the core of ICT to spread education through

E-Learning. E-Learning allows higher participation and greater interaction. It challenges the concept that face to face traditional education is superior to it. Paper further highlights that self-learning is the thing that never happens. Therefore, education apps come with numerous material resources so that students can pleasantly interact with them. The paper also elaborates the benefits and challenges of e-learning among the students.

Keywords: Mobile Apps, Education System, Artificial Intelligence, Chatbots, Gamification, Virtual Reality, Remind, Photomath, Duolingo, Smart learning; Enhanced interaction; Bridging gaps between parents and teachers; tracking students' progress; providing eBooks and online study materials; 24x7 availability of materials; self-learning and e-learning.

Building an Ontology for the University Domain using Protégé: A Case Study of Central University of Himachal Pradesh (CUHP), Dharamshala

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Abstract: Web technologies have evolved very rapidly since the invention of the World Wide Web in 1989 by Tim Berner Lee. A large number of web-based platforms have been developed and commissioned for providing meaningful information to users. The main challenges of web-based information retrieval systems lie in the management of a plethora of unstructured and heterogeneous information distributed on different web platforms. To overcome this, the concept of the semantic web which is also known as Web 3.0 was emerged to integrate the various heterogeneous sources to provide semantic and scientifically retrieval of information. The main aim of Web3.0 was to develop applications such that software agents can understand and interpret the content spread across the various web platforms. The ontology is the core layer of semantic web architecture and is defined as explicit specification of conceptualization. It defines the classes, objects, and their relationships. In the present study, we describe the development of anontology for a university domain based on a seven-step methodology. This case study will conceptualize the working of the Central University of Himachal Pradesh, Shahpur Campus. The proposed framework will set various competency questions based on a hierarchy of classes; disjoint classes; intersection and union of classes; has-value and cardinality constraints. The resulted ontology will be presented in graphical form.

Keywords: Semantic Web; Ontology; Protégé; University; Content management; Content Organization

Re-designation of Librarian: Empowering Human Resource

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Abstract: The designation is a name given purposefully to a person for his job and it is the term used for identification of a particular job. The status and cadre of librarian has been a controversial topic in the academic circle of our country. The designation of the post of "Librarian" should be reviewed in the present ICT Scenario. Other departments used to review and change the designation of various posts from time to time as per the need and demand on the basis of work, responsibility, nature of work, status, cadre etc. Article discusses that we are not meeting the demand of the hour and we are still behind the time.Person working anywhere is librarian whether it is a public library, school library, college library, university library, special library, research institution, digital library, e-library and so on. All the designations are "librarian and librarian". A questionnaire is circulated and online survey method is adopted for observing the opinion of the library professionals, teachers, students, research scholars regarding changes in nomenclature of the "Librarian Post" at various levels i.e. schools, collages, University and Public Libraries.The data is analysed in form of tables and charts.

Key Words: **Introduction:**

Review of Related Literature

Fisher, D. P. (1988)[1] study reveals that "that many people tend to misunderstood librarians, their skills and their work. They also have various misconception about image and status'.

According to **Manoj K Joshi** [2] "The image of librarian just like a clerk in the society and people think that his main work is only issue and return of the books."

Prins and Gier [3]concluded on the basis of International survey "the library profession has been facing image problems for a quite long time. Further they stated that there is no easy and fast solution to change the image of the library professionals. Librarians should find out new ways to sort out this very serious issue".

Fagan, J. C., Ostermiller, H., Price, E., & Sapp, L. (2019)[4], conducted a study toknow the Librarians' image, role and work among the students and staff. The study reveals that students and faculty members have the limited views about the

librarian. The study aims to investigate the following objectives such as identifying the prevailing images and stereotypes of librarians among the students

Ali, S., Yu, H., & Amran, N. (2018) [5]**,** conducted a survey to annayse the image, skill and work of the librarian of public libraries. The findings shows that users have stereotype image of librarians in Malaysia.

According to the survey conductedby **Bickley, R., & Corrall, S. (2011)** [6], "librarians were considered as unambitious people, although as a whole, they were perceived as inefficient, unintelligent, apathetic, and uncooperative".

Vassilakaki, E., & Moniarou-Papaconstantinou, V. (2014) [7] "analysed "librarians perception, students perception and media perception about Library and information Science professionals. It was found that librarians were negatively perceived by both the wider public and the students. In the mass media "the old maid" image was dominant.

The study conducted by **Pachauri, NK (2020)** [8] reveals that "the image of a profession is created in form of the judgment or perception of others byanalysing the nature of work, type of work, customer satisfaction, quality and quantity of theperformance etc. **Dike Chide, A and Nkechi, Amaechi (2014)** [9] discussed that "change in designation of Teacher librarian will empower them and it will reflect in their new and changing roles in education. The research recommends that the designation of school librarian should Library and Media Specialist for effective utilisation of human resource".

As per **Bewick, L. and Corrall, S. (2010)** [10]"In the present ICT era the role and responsibility of librarians as teachers has also developed significantly. They are showing their expertise into the online classrooms, institutional course management system, virtual learning and automated systems."

Scope of the Study

The study is conducted to know the opinion, perception and re-designation of librarian at various levels like school, college, university, research institutions and public libraries.

Methodology

Online survey method is the primary data collection instrument in this investigation. Google form is created and sent to students, teachers, research scholars, librarians, professors and other professionals via WhatsApp groups,

email, social media groups etc. Data tabulated and analysed in form of charts and tables. Various designations are suggested for all the levels and through a mix of closed and open ended questions for respondents. The suggestion column is also provided for recommendation and guidance.

Data Analysis

Do Designation Really Matter?

Role of Professional Associations :

Recommendations

Conclusion

The designation is very significant for everyone in his/ her professional life. Designation has the direct relationship with experience, seniority and hierarchy in the organisation. Therefore, designation must be used which may reflect his/ her cadre, status, work profile position and pay structure in the organisation. We should pay the homage to the father of Library Science Dr. S. R. Ranganathan because he was the person who gave us the teaching cadre pay scales at par with teachers. Being a member of UGC Committee Dr. Ranganathan did splendid job for librarians.

Scholarly Digital Communication on Climate Emergency as Reflected in Web of Science: An Analysis

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Summary of the Paper

Introduction: The Urgency and risk arisen due to the degradation of climate condition and global warming has led to climate emergency. It is a major crisis which is currently facing all over the world. Since its emergence, it has been gaining intentness worldwide. The current paper attempts to study the digital scholarly communications on climate emergency published from India as indexed in Web of Science Core Collection Database. It highlights the research areas, discipline wise distribution, year wise distribution, institutional affiliation, article sources, document types, author keywords occurrence.

Objectives: The main objectives of the study are to survey the scholarly publications available in digital format in the Web of Science and to measure the research trends on climate emergency.

Scope & Methodology: The scope of the study is limited to climate emergency research published from India & only the data extracted from Web of Science is considered. All types of documents published digitally along with DOI number are considered for the study. The analysis is done using "RStudio Bibliometrix-Biblioshiny" package along with the Web of Science in-built analytics tool. A total of 1611 documents published from India during 1990 till January 2021 are covered. The publications were retrieved from the Web of Science Core Collection Database limited to citation indexes such as Science Citation Index Expanded(SCI-EXPANDED), Social Sciences Citation Index (SSCI) and Arts & Humanities Citation Index (A&HCI). The advanced search query used to extract the data for Web Science Core Collection Database are TI=("Climate Change" OR "Climate Emergency" OR

"Global Warming"). It is found from the study that Indian Institute of Sciences has the highest number of research publications. Considering the publication source, Current Science contributes maximum research articles with 168 publications. And "Climate Change" is the most occurring author keyword with 646 in its counts. It is found that most of the research is from the environmental science discipline and the dominant research area is environmental sciences ecology with 579 research articles.

Suggestions, Recommendations & Conclusion: Climate emergency has arrived and is expediting more hastily than most scientists anticipated and many of them are intensely concerned. Considering the current perspectives and importance of the climate emergency issue, the present study is expected to throw light on the scenario of the country's climate emergency research publications, which, in turn, would provide clues on the state of the art on the issue.

Keywords: Climate Emergency; Climate Change; Global Warming.

Use of E-Content Development in Teaching & Learning

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Abstract: In this technological age, today's learners are techno-savvy, that we need to understand and use of ICT technology in our education system, not only use the ICT technology but utilised them such a way that the todays techno-savvy learners get attention in learning process. Econtent is a latest media of learning and attracting the attention of the learners. E-Content is a most valuable method to construct or develop the information in electronic form and make available to all at any time, any place, any one to utilised it. Present Paper focuses on Impact of E-Content in teaching and learning process of education. E-content used by teachers those were recently completed the training workshop / Seminar / FDP on E-content Development. Author use questionnaire method for collecting the data.

Keyword: E-Content, E-Learning, Recent method of teaching & learning.

Digital Library, E-Resources and Changing Role of Librarians and Information Professionals

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Abstract: The advancement of Digital libraries and e-resources has brought a lot of changes not only on the libraries and information services but also on the roles and expectations of the librarians and information professionals. As a librarian you are expected to do more and more improving with fewer and fewer people. There is a real danger that librarians and information professionals will be left behind if it still insists on the old role of the traditional librarians. So it is important that there is a new change in paradigm. This paper will attempt to understand what a successful, relevant and dynamic librarians and information professionals must be in this Information Age. It will also focus on the issues, trends and challenges in preparing new era librarians and information professionals.

Keywords: Digital libraries, E-Resources, E-Libraries, Role of Librarians, Role of Information Professionals.

Introduction

A digital library is a collection of documents in organized electronic form, available on the Internet or on CD-ROM disks. Depending on the specific libraries, a user may be able to access magazine articles, books, papers, images, sound files, and videos. Electronic resources are materials in digital format accessible electronically. Examples of e-resources are electronic journals, electronic books online databases in varied digital formats, Adobe Acrobat documents (.pdf), WebPages (.htm, .html, .asp etc) and more. Librarian duties include organizing library materials so patrons can easily find what they need. Assembling and indexing databases of library materials is also part of the librarian's role. Some librarians specialize in technical services, where they obtain, prepare and classify new materials. An information professional or information specialist is someone who collects, records, organises, stores, preserves, retrieves, and disseminates printed or digital information. Information professionals work in a variety of private, public, and academic institutions.

Conclusion

Today we all agree that to cope with the changing dimensions of digital era. The explosion of information products today users are increasing unable to deal with the problem of information overload. The fundamental goal of library is to provide

right information to right users at right time and to fulfill this goal it is necessary for librarian and Information professionals to keep pace with the changing need & demand of users in present digital and market oriented environment. The digital librarian's role will be increasingly towards offering consultancy to the users in their efforts in providing digital reference services, electronic information services, navigating, searching and retrieval of digitized information through Web documents that span the Universal Digital Library or the Global Digital Library. The new era librarian and Information Professionals will be an embodiment of a digital information professional or digital knowledge worker, who will ensure that the digital libraries are used effectively and with ease.

In this technology driven era librarians and his team has to play important role as they have to satisfy the multidimensional information needs of users. They have to use those technological tools in which users are comfortable. There is need to equip them with emerging skills. They should have knowledge about ICT as well as its actual application. Modern librarianship has become highlyspecialized job which requires positive attitude towards change and technological up gradation.

Effectiveness of Training & Development Practices onthe Agricultural Library Professionals in Digital Era: anEmpirical Study

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Introduction

Training has a purpose to make workers and employees proficient in their present jobs while development is to prepare employees for handling more responsible and challenging job straining imparts to teach technical skills while development to human and conceptual skills. Training is beneficial to both, employers and employees. A well-trained employee is an asset to the enterprise because his or her efficiency and productivity is high. Training enables the employees to obtain job security, higher earning and promotions.

Scope of the Study

The scope of the study deals with the aim of training method used in the organization. Training importance its significance on employee performance, and satisfaction of employees cover under scope. The study will be useful for the organization to determine the organization success of training provided.

Research Objectives

In accordance with the above general objectives, the specific objectives of the study are: -

1. To identify the factors that affect Training & developmentpractices of library employees in the selected agricultural libraries.
2. To know the library employee's satisfaction on training & development practices within the library.

Hypotheses

1. There exists no significant difference in the training & development practices of library employees regarding their gender.

2. There exists no significant difference in the training & development practices of library employees regarding their nature of job.

Research Methodology

The study is mainly based on the primary data collected from the professionals working in different agricultural university libraries (regular and deemed) of northern Indiastates.Descriptive survey design was adopted for this study. The information, opinions, perceptions, and attitude of these library professionals were collected and analyzed.

Population and Sample

The entire professional staff of nine agricultural university library in northern India states formed the population of the study. A total of 110 copies of questionnaire were distributed but only 96 were dully completed and returned with a response rate of87.27%. So, a sample of 96 male and female library professionals of different nature of job working in different libraries of Haryana, Punjab, Himachal Pradesh, Uttar Pradesh, and Uttrakhand constituted the sample of the present study.

Statistical Techniques Used

Mean, standard deviation, 't' test and ANOVA were used to analyze the data. Thenull hypothesis formulated for this study was tested for significance difference.

Finding of the Study

The finding showed that "There is no significant difference in training and development of male and female professional library employees" stands retained. The finding further revealed that permanent employee varies considerably with the group of adhoc and part time employees, but employees of adhoc and part-time do not varies considerably with each other. Hence, it may be concluded that nature of job also plays a significantly role in Training and development. Permanent employees were found more satisfied with Training and development than respondents working as part-time and adhoc basis.

Metadata Practices for Scientific Data Repository in Technical University Libraries of Odisha : A Survey

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Abstract: The integration of scientific data sets into repository collections is a continuing challenge for research institutions in Technical universities of Odisha.. The Metadata Best Practices were developed to facilitate discovery of materials.A number of large-scale digital libraries worldwide are now generating subject metadata to describe not only individual objects but entire digital collections as an integral whole. Repository system functionality impacts how metadata is created and entered. Quality metadata reflect the degree to which the metadata in question perform the core bibliographic functions of discovery, use, provenance, currency, authentication, and administration.

Purpose: The purpose of this study was to study how the research scholars, scientists and information professionals use information organization techniques, specifically descriptive metadata creation, when working with scientific data sets. This study also presents the current state of research and practice on metadata quality through focus on the functional perspective on metadata quality, measurement, and evaluation criteria coupled with mechanisms for improving metadata quality in Odisha. It explores the types of metadata and vocabularies utilized, issues of interoperability, end user-created metadata, and staffing for metadata planning and creation.

Research methodology: During the 60-day period from November 2019 to December 2019, a total of 350 completed responses were received by the survey management system. Data were collected through questionnaires, data set deposition, and metadata field completion. The survey investigates how metadata has been implemented in Technical University digital repositories of Odisha: what kinds of projects or initiatives have been undertaken, what types of digital objects are associated with metadata, who are creating metadata, what schemas and tools are used to create and manage metadata, and the organizational changes and challenges resulting from the adoption of metadata in the libraries.

Practical implications: This study helps to improve repository systems designed toaccommodate the special needs of scientific data sets. The research suggests how to organize scientific data sets and how to interpret the descriptive metadata used in both information professionals and scientific communities.

Originality/value: It describes the workflows established to create accurate and consistent metadata, focusing especially on the batch ingest and retroactive metadata remediation processes. Results of the study indicate a pressing need for the building of a common data model that is interoperable across digital repositories.

Keywords: metadata, cataloging, metadatapractices, digital repositories, metadata quality, scientific data, Dublin Core ApplicationProfile, Technical universities

Role of Digital Literacy in Usage of Library Digital Resources

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The purpose of this paper is to find out the Role of Digital Literacy & Competencies in usage of Digital Resources. In 21st century, Our education system has been changed in reference to its content, structure and requirement. Libraries are store house of knowledge, so in modern scenario we can say that libraries are store house of Digital knowledge. In Digitalized era its sole_responsibility of Librarians to transfer the technical information related to usage of Digital Resources and to achieve competencies to access the information effectively and efficiently has changed dramatically. Without Digital literacy, Digital Resources are of no use. Digital Literacy provide to scope of e-learning to all type of Libraries.This paper focuses upon the means to improve basic Digital Literacy competencies including ability to use Microsoft office, Excel, Power point, LAN, WAN & MAN. To improve intermediate competencies including the use of OPAC search, Databases search & online browsing. This paper also stresses upon the ways to learn advanced Digital Literacy competencies including usage of internet, www, email, blogging, web page designing, Library portal & search engines. The purpose of this paper is also to suggest the methods to master the skills related to advanced search and retrieving techniques etc.

Keywords: Digital Literacy, Information Literacy, Computer Technology, Digital Resources

The Impact of Social Media and Social Networking in the library Services

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Abstract: This paper describes the contribution of social networking in library services. Today Libraries get very big gift from information communication technology .The user expectations from the LIS Professionals are also increasing due to wide availability of information Social media is a very powerful as well as user friendly channel of communication to user . Now a day everyone is connected with each other by mean of various social networks likeOrkut, Facebook, Googleplus and LinkedIn etc. Social networking Sites are the new technologies offering libraries the opportunity to its users. Academic Social Networking sites have created anew social dimension where scholars can increase their educational and research awareness .

In this paper examines the current trends in library , Use of Social Media in Libraries , Various types of social networking services librarian can provide to his user. Application of social networking services in academic libraries is also discuss in this study.

Keywords : Social Media, Social networking , Library Services

Introduction

Library is more important point of every institute .Today's libraries are going to upgrade more use of information technology in its daily work. Social media is popular in Researcher and students.They are frequent user of social the help of this they are connected with various information sources . Recently libraries are focused on digital library because so many references are available on internet. Librarians main role is to collect information and provide to the user group.

ICT has made possible for transmission of information to all by using various electronic Channel. Social Networking services provides an innovative and effective way of connecting user all over the world . Social Networking Sites such as Linkedln, My space , Twitter and Blogs helps librarian to share information with patrons and students in the easiest way for digital library environment.

Objectives

1. To Introduce use of Social Media in Library.
2. To study the Social Networking Tools for library Services.
3. To introduce benefits of Social Networking websites to libraries.
4. To study the current trends in Libraries.

Use of social media in the Library Services

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Introduction

In today's Era of advanced technology, the major task of information and its dissemination needs to be done very accurately. There are many examples today of how information can be used for good and for bad. This article is about how to use social media in the Library. Library services can be delivered effectively with the use of Social media. In this global pandemic of covid-19 we saw many changes most remarkable was online dissemination of information in various fields.

Objectives

1. To find out through which social media library facilities can be provided.
2. To know what problems librarians have to face while using social media.
3. To Learn how librarians can use social media.

Methodology:

This article is based on a descriptive method & personal experience while giving library services online mode using social media.The information is collected from articles available on various websites.

Conclusion

Using social media to provide information about library services, information, resources, important events, , etc.,

Awareness of using technology among library staff.

The library needs to be modified according to the needs of the library reader.

Suggestions and recommendations:

1 Internet service should be provided in every library.

2 The library should have its own website

3 Librarians should be trained on the use of social media and should be made aware of various services and information sources in the library.

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Emerging and Innovative Technologies in Libraries

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Introduction

With the emergence of innovative technologies like Artificial Intelligence, Cloud Computing, Internet of things (IOT) etc. the world is moving towards automation, digitization. People are getting more used to digital objects which are user frindly, fast and sophisticated. Libraries from traditional times played a pivotal role in academics. Hence it is our responsibilty to use these sophisticated technologies and build smart libraries, which are user friendly, technologically upgraded and sophisticated.

Objective

- To come out with innovative ideas that can be used in libraries, which make libraries smart, user friendly.
- To use emerging technologies like Artificial Intelligence, IOT, Big Data etc in academic libraries.

Scope

- Through this research paper an honest attempt has been made to provide with innovative solutions for existing problems in libraries.
- The prescribed solutions can be implemented in any libraries to make them smart, user friendly.

Methodology

An extensive review of literatures and journals have been done to find out recent trends in “smart libraries” and use of innovative and emerging technologies. To know about problems faced by students, professors and librarians. I have talked to set of people to know about their genuine concerns and came up with some innovative solutions to address those problems.

Conclusion

Through this paper an attempt has been made to open doors of libraries for emerging and innovative technologies. It is necessary for librarians as well for libraries to get digitized and one of the best way to do it is to use innovative and energing technologies.