Emerging Technological Innovations in Libraries

Editors
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Associate Editors

Mr. Prithivi Raj, Ms. Tanu Kapoor

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Preface

Information technologies are already an intense element of daily life. The primary objective of libraries is to organize and provide access to information, and it remains the same although the format and methods have changed drastically. New technology has provided great opportunities for the delivery of services within consortia. More and more libraries must unite, which of course requires a change in the attitudes, practices, and policies to get the maximum benefit. For transforming the clientele experience, improve productivity, and to bring overall gain to the respective organizations, technologies like artificial intelligence and machine learning have been leveraged by the digital leaders. There is an exponential rise in the digital change and is reflected and outshined in all directions, thereby, requiring the new digital innovation solutions to library centers of special genesis and academics, hence leading to digital competition. Researches have to be carried out with the aid of technological advancement to compete with the fast-growing environment. The library movement in India is rapidly increasing and the traditional libraries are now on their way to digitization in a phased manner. In a developing country like India; library professionals have to take careful and judicious decisions in selecting library materials. Digital preservation is an accurate rendering of an authenticated content over time. For archives and the active management policies, strategies, and actions are taken to consolidate access to a newborn digital child. Challenges emerging out of library services and in management, technological advancements have to be updated regularly to meet the competitive requirements of the faster-growing environment. This book elaborates on how technological innovations have led to improved information management and library services. The overall purpose is to share the resources using new technologies with the facilities available that would provide a variety of features to save time, promote community development, and drive better services for the library users. This book

primarily fills a gap in the digital library project management literature by providing an overview of the issues related to implementing and using emerging technology and innovative practices within libraries. The book also throws the light on a practical approach to innovation of emerging technologies in libraries and defining the technologies in the context of their use in real situations. The book serves as a guide for those who are interested in learning and implementing the emerging and available technologies for the enhancement in library services.

This book consists of all chapters authored by prominent library specialists and the academicians, who have touched upon all the aspects of library and information sciences like the importance of digitalization, online database, transfer of knowledge management, use of social media tools for broadcasting data, standard research methods applicable in ICT, digitalization of libraries, data mining application, online information searching patterns for the students, library data security, and the predatory publishers.

<div align="right">Editors</div>

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COVID - 19 Impact on Libraries, Library Users and Library Professionals

*Ruma Kumari Singh**

Introduction

COVID-19 pandemic not only affected one nation but the entire world. The situation which no one could have imagined in their worst dreams. The situation for which we don't have a solution, though, the entire world is trying their way to contain the spread of virus by either imposing nationwide or localized lockdown.

This decision not only impacted financial sectors but education sectors as well. Most government have temporarily closed all educational institutes. These nationwide closures are impacting over 60% of the world's student population and almost similar percentage of non-student group who includes professionals or research fellows. The below statistics collected from UNESCO website provide a rough picture of learners affected due to such nationwide or localised lockdown across the world.
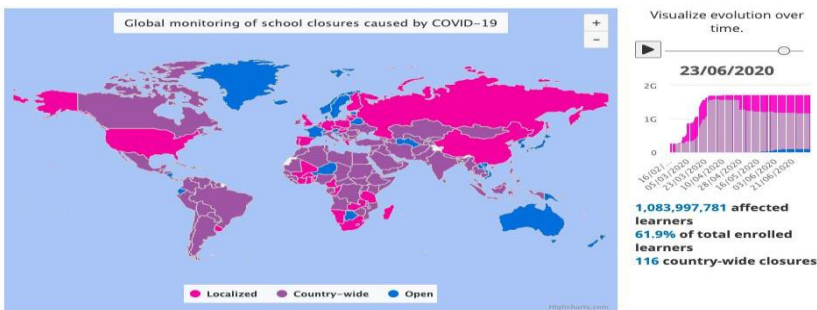
Note: Figures correspond to number of learners enrolled at pre-primary, primary, lower-secondary, and upper-secondary levels of education [ISCED levels 0 to 3], as well as at tertiary education levels [ISCED levels 5 to 8]. Enrolment figures based on latest UNESCO Institute for Statistics data. See methodological note.

* *Library Associate, Email: ruma.rumi@gmail.com*

Library science is also not left untouched by this pandemic. The closure of educational institutions impacted library operation and library professionals as well. Library is one of the important pillar in learners growth as it is considered one of the most important source of knowledge and repository. Closure of institutions, public and central libraries has added to learners pain point. The learners, researchers who are habituated to access physical library or physical source of information are impacted most. It is difficult for them to find the required information on time.

However, such situation may have its downsides but it also presents a hidden opportunity. The sudden break to our regular actions brought an opportunity to think differently and out of the box. This pandemic let the library professionals to think differently and provided an opportunity to these research fellows to explore the unexplored area of digital platform and promote e-resources and e-learning as much as possible.

Objectives

The objective for this article is to study the impact of COVID 19 on library science, library user and library professional. This article is aimed to provide some insights on the current situation along with the future of library science.

Current Situation

The nationwide lockdown resulted in closure of educational institutions and libraries. This further resulted difficulty in getting the required resources for research, insights and information what that generally a learner/student gets by visiting a library or accessing the reading room of schools, institutes, public or central library. The situation has impacted library professional as well to some extent by bringing the uncertainty to the future of physical libraries.

To understand the impact, we first need to understand the types of libraries we have in place and the users associated with it.

The various library facility we have in place are:

1. National Library
2. Academic Libraries
3. Public Libraries
4. School Libraries

a. National Library

The National Library of India is the largest library located at Belvedere Estate, Alipore, Kolkata and is closed since March. It is India's largest library by volume and public record and attracts large numbers of users.

The closure of national library impacted huge number of users not only due to restriction on accessing the required material but also accessing the reading room of the library. As a learner or researcher, users always look for reading facility and environment where they can concentrate on their subject, access the required information on the spot etc.

Though, the library started its operation from third week of April'20 with limited staff as per government guidelines but is remained close for the general public. There is still an uncertainty by when it will be accessible to all and start normal operations.

b. Academic Library

Academic library or libraries are operated under either university or institutes. These libraries facilitate the services to the large number of students by providing the right content, information and journal.. The researchers, scholars and college students are mostly dependent on library services and library reading room.

Closure of library facilities and services amid pandemic has affected this large chunk of college/university students. Few of the academic libraries have e-services facility but not all.

- **Public Library**

Public library is a non-profit library that is accessible to general public. These libraries attracts the public or learners who do not have access to either National library, Academic library or school libraries. Delhi public library, British council and many more are example for these.

Closure of these libraries affected those users who were regular members, cannot access either of national, academic or school libraries and are highly dependent on these library for their research or personal growth.

- **School library**

"*The school library provides information and ideas that are fundamental to function successfully in today's information and knowledge based society. The school library equips students with life-long learning skills and develops the imagination, enabling them to live as responsible citizens.*"

The School library is foundation for better tomorrow. Though the users are not dependent on school libraries because of small collection of information but is still a source of information for those who aspire to do big in life. School going student uses library to improve their reading habit and increase their knowledge outside regular activities.

However, they are also not left untouched in this pandemic and have many challenges across.

This pandemic has brought various types of challenges to the libraries and their users. Few of them are listed as:

- Reaching out to regular users
- Enabling users with right content and right information
- Library setup post pandemic or disaster.

- Future shape and scope for library basis the lesson learnt during this crisis
- Employment challenges for those who are on ad-hoc or temporary role etc., due to reduced usage and future uncertainty.

These are the big challenge not only in front of libraries but also to the library professionals and the users.

To tackle the situation and handle the user issue many library professionals and libraries have come forward to provide their support by various means.

There were various seminars, webinars, workshops and other such sessions conducted by various library association like ILA, IFLA, IIT etc. Where many library professionals, renowned librarian from across the world came together on single platform, provide the insights, their views on how library is changing with time.

While the world is learning to live with the new norms and so are we. There is a consistent transition to distance learning at an unprecedented scale. Institutes are racing to shift their courses online; students are engaging en masse with e-books and e-learning; and researchers are drawing chiefly towards electronic journals.

UNESCO has also come up with various plans to respond to this situation and help countries to scale up in their distance learnings. UNESCO recently launched the "Global Education Coalition" to handle the current situation where there are providing required content or help as needed to the country and institutions.

Digital libraries and publishers have also risen to the occasion and offering more free contents to enable the end user.

In India various institutes/ school/ libraries have already started leveraging the available e-resources online portals to enable their end user with required information's. There are many e-resources like:

- e-PG Pathshala

- SWAYAM

- Swayam Prabha

- e Shodh Sindhu

- Shodhganga

- ShodhGangotri

- NDLI (National Digital Library of India)

has opened up numbers of strong digital content, including a wide range of materials in the form of e -books, audio books, lecture materials, thesis, reports, articles, journal papers, questions papers, solutions, data and simulation tools in addition to otherwise popular formats of video lectures and courses.

NDLI alone has opened up approximately 3.5 crore digital content for students, researchers, teachers and learners of all ages. Out of the 3.5 crore digital content, while 2.7 crore were open access document, another 77 lakhs digital content has been made freely accessible to NDLI users through national license by MHRD.

The library has also put up a special button called 'Corona Outbreak: Study from Home" that contains specially curated materials for school and college students covering Engineering, Science, Management, Humanities and Law.

The other libraries/institutes are also coming up with innovative ideas like integrating catalogue records, digital library items, Institutional Repository, Institutional Bibliography, Other library collections and resources. The libraries and library professionals are providing online training and awareness programme to user regarding accessing the right information with e-resources by conducting different types of webinar on E-learning sources.

The above mentioned changes are in the right direction and giving an opportunity to explore the unexplored. This is giving the power of understanding the digital era more closely and in a better way.

This is a chance for all library professional to think differently and think out of the box. As a library professional we need to work on, to know and understand today user demands, should spend time in understanding the technology and how can to leverage it for betterment of library and the end users.

As library professional we should start focusing more on e-resources (born digital and gone digital) like:

- E-book
- E-journals
- Databases
- Institutional repositories
- Special digital collections

And less focus on

- Print resources
- Print books
- Other physical materials

This pandemic situation certainly going to change the shape of library and library future hereon.

Conclusion

This pandemic may have given us a life lesson but also open the doors for opportunities. Yes, it has impacted us in a way or other but taught us how to look the perspective future has. The above information shall work like pillar to build yourself and not to think pessimistically but differently and leaving behind the traditional approach.

The main objective for this article is to define the current scenario of library services, users and library professional and the future shape of the library.

Library science should be exploring an innovative way to reach out their user by leveraging new technologies, AI/ML and e-resources. Use of technology in library can enable users n accessing the required data, information in terms of e-resources remotely from anywhere, anytime.

Public /central library should also think of enabling e-contents and using technology or virtual rooms to enable the user without compromising with the current situation.

The library should come up with the new set of guidelines not only for users but also for the library professionals. As a librarian and on behalf of library science we should encourage and promote digital content and work on providing e-resources, right information to the user anytime and from anywhere.

The above article is collection of few information from the sources mentioned under References section and the personal research and experience in library field.

References

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3. Several webinars/seminars

Content Analysis of State Private Universities' Libraries Website in North East India: An Evaluation

*Sur Chandra Singha**
*Dr. Manoj Kumar Verma***

Abstract

The library website is playing a very significant role in disseminating information services to users. The report on the present study will help decide to update the State Private Universities Libraries website. The eighteen State Private Universities Libraries Websites in North East India were selected for the study basis on content available on their websites. The present study revealed that University of Science & Technology, Meghalaya (USTM) and Sikkim Manipal University became "very good" ranking score compared to other states private university, whereas "lower-ranked" libraries are Assam down town University, Krishnaguru Adhyatmik Visvavidyalaya, The Assam Kaziranga University, Arunachal University of Studies, Indira Gandhi Technological and Medical Science University, CMJ University, The Institute of Chartered Financial Analysts of India University (ICFAI University), Nagaland, etc. needs improvement to provide the basic library services as per user demands.

Keyword: Content Analysis, State Private University, Website, North East India

* Research Scholar, DLIS, Mizoram University, Aizawl
Email – surchandrasngh162@gmail.com
** Associate Professor, DLIS, Mizoram University, Aizawl
Email – manojdlis@mzu.edu.in

Introduction

The website continues to change as a gateway for providing web-based library services to the students and faculty members. In today's digital environment, user communities are becoming web-savvy and there is an increasing demand for the user's community for web-enabled services to be provided by the libraries. The website provides remote access to information easier, more viable, more economical, and very easy to keep it up-to-date. The university website must be designed and developed so that the existing library resources and services may provide to users easily. Keeping in mind these points, this study was planned as an in-depth evaluation of selected universities library website for a useful presentation and perusal of the concerned in the area.

Review of Related Literature

In the library science field, a lot of work has been done in content analysis related to a particular theme but still not studied in State Private University Libraries in North East India. The researcher keeps an eye on only those literature, which was found relevant and contributed by different experts' views. The following are given below.

Konnur et. al (2010) have studied the evaluation of Academic Library Websites in Bangalore City of Bangalore University, Indian Institute of Science, Indian Statistical Institute, Indian Institute of Information Technology, and National Law School of India University. It was observed that academic library websites in Bangalore city had not come up to the level as virtual expectation of the quality level of academic excellence. The researcher recommended that it was important for academic libraries to execute inside as well as outside and physical evaluation of the websites.

Tella & Oladapo (2016) undertaken and sampled for data collection twenty university library websites including top ten ranking Nigerian

universities and top ten ranking South African universities. The researcher found that the use of Web 2.0 tools in the selected universities was encouraging. And given information more Web 2.0 tools available on the South African university library websites. And finding showed that there were more e-resources offered on the South African university library websites related to their Nigerian counterparts. E-Journals were the most available e-resources in the selected university library websites of both countries.

Vasishta (2013) studied to assess the content of electronic journals from technical university libraries websites in North India. It was observed that technical university libraries websites were trying to improve useful websites for the user's community but most of the library websites seem to be at the nascent stage. The majority of university libraries' websites had very simple and basic features. However, it gave a platform for the appropriate dissemination of electronic journals to users. The researcher recommends that the library website must make for the advancement of the websites in the system of enhancement in several aspects like artistic composition, quality content, and users friendly.

Wilson, D. E. (2015) conducted the content analysis of twenty-four academic library websites. The researcher revealed that while academic libraries were providing more online library services, several remain to deficiency certain services or fail to implement basic and accessibility standards and web design.

Scope of the Study

The scope of the present study is limited to only state private universities of northeast states. Presently there are 33 private universities in 8 States of North East (source: (https://www.ugc.ac.in/privatuniversity.aspx as on 5th February, 2020) but only 18 private universities having library website presently and 15 universities libraries don't have library website/webpage. Thus these fifteen universities (The Assam Royal

Global University, Apex Professional University, Arunodaya University, Himalayan University, North East Frontier Technical University, The Global University, Venkateshwara Open University, Manipur International University, Sangai International University, Mahatama Gandhi University, Techno Global University, University of Technology & Management, William Carey University, St. Joseph University, Nagaland and The Global Open University, Nagaland) were excluded from this study. Thus, the scope of the present study is limited to only 18 private universities libraries websites as listed in table-1.

Table 1: List of Selected State Private University of North East India

Sl. No.	Name of the University	URL	Library Website URL
Assam			
1	Assam Don Bosco University	http://www.dbuniversity.ac.in/	http://www.dbuniversity.ac.in/Library.php
2	Assam down town University	https://adtu.in/	https://adtu.in/About%20Us/Facilities%20@%20AdtU.html
3	Krishnaguru Adhyatmik Visvavidyalaya	http://www.kav.org.in/	http://www.kav.org.in/library/
4	Mahapurusha Srimanta Sankaradeva Viswavidyalaya	https://www.mssv.co.in/index.php?index	https://www.mssv.co.in/lib_mssv_o.php?index
5	The Assam Kaziranga University	https://www.kazirangauniversity.in/	https://www.kazirangauniversity.in/student/general_rules

	Arunachal Pradesh		
6	Arunachal University of Studies	https://arunachaluniversity.ac.in/	https://arunachaluniversity.ac.in/library/
7	Indira Gandhi Technological and Medical Science University	http://igtamsu.ac.in/	http://igtamsu.ac.in/library/
	Meghalaya		
8	CMJ University	https://www.cmjumeghalaya.edu.in/index.htm	https://www.cmjumeghalaya.edu.in/facilities.html
9	Martin Luther Christian University	https://www.mlcuniv.in/index.php?option=com_content&view=frontpage&Itemid=1	https://www.mlcuniv.in/index.php?option=com_content&view=article&id=118&Itemid=171
10	The Institute of Chartered Financial Analysts of India University	https://www.iumeghalaya.edu.in/	https://www.iumeghalaya.edu.in/Infrastructure.html
11	University of Science & Technology, Meghalaya (USTM)	https://www.ustm.ac.in/	https://www.ustm.ac.in/library/
	Mizoram		
12	The Institute of Chartered Financial Analysts of India University	https://www.iumizoram.edu.in/index.html	https://www.iumizoram.edu.in/Infrastructure.html

Nagaland			
13	ICFAI University, Nagaland	https://www.iunagaland.edu.in/index.html	https://www.iunagaland.edu.in/Infrastructure.html
Sikkim			
14	Shri Ramasamy Memorial University, Sikkim	https://srmus.ac.in/	https://srmus.ac.in/library
15	Sikkim Manipal University	https://smu.edu.in/smu.html	https://smu.edu.in/smit/smit-experience/library.html or https://smu.edu.in/smu/campus-life/our-campus/campus-facilities/library.html or https://smu.edu.in/smims/why-smims/library.html
16	The Institute of Chartered Financial Analysts of India University	https://www.iusikkim.edu.in/index.html	https://www.iusikkim.edu.in/Resources-Facilities.html
17	Vinayaka Missions Sikkim University	https://www.vmsuniversity.in/	https://www.vmsuniversity.in/library/
Tripura			
18	ICFAI University, Tripura	https://www.iutripura.edu.in/index.html	https://www.iutripura.edu.in/Central-Library.html

Objectives of the Study

The present study attempts to accomplish the following objectives:

1. To determine the number of State Private University Libraries website functioning in North East India;

2. To identify the basic information about the library, library collections, facilities, library services provided on the website, links to other E-Resources;

3. To analyse the type of contents and features of State Private University Library websites in North East India;

4. To know the Web 2.0 Application and Services on the websites;

5. To recommend measures for the upgrading of State Private University Library websites in North East India.

Research Methodology

A survey and observation methods were used in this study for data collection. A checklist was designed and developed based on the earlier study (Devi, Krishna Ksh. and Verma, Manoj Kumar, 2016) for the collection of research data from the selected libraries website. The collected data was scrutinized and tabulated for interpretation.

Table 2 : Basic in formation of State Private University Library Websites

General Information	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	%
About Library	✓	-	✓	✓	-	✓	-	-	✓	-	✓	✓	✓	✓	✓	✓	-	✓	66
Mission Statement	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	05.55
Working Hours/ Holidays	✓	-	-	✓	-	-	✓	-	-	-	✓	-	-	✓	✓	-	-	✓	38.88
Library Membership	✓	-	-	✓	-	-	-	-	✓	-	✓	-	-	✓	-	-	-	✓	27.77
Library Rules	✓	-	-	✓	✓	-	-	-	✓	-	✓	-	-	✓	✓	-	-	✓	44.44
Copy Right	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	05.55

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	%
Library Committee	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	05.55
Library Staff	✓	-	-	-	-	-	-	-	-	-	✓	-	-	-	✓	-	-	-	16.66
Site Map/ Floor Map	✓	-	-	-	-	-	✓	-	-	-	✓	-	-	-	✓	-	-	-	22.22
Library Sections	-	-	-	✓	✓	-	-	-	-	-	✓	-	-	✓	✓	-	-	-	27.77
Downloads	-	-	-	✓	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	11.11
News	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	05.55
Images Gallery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	✓	11.11
Domain	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	05.55
Total Score (Max 14)	8	-	1	6	2	1	3	-	3	-	10	1	1	5	7	1	-	5	

Note: Assam Don Bosco University (01), Assam down town University (02), Krishnaguru Adhyatmik Visvavidyalaya (03), Mahapurusha Srimanta Sankaradeva Viswavidyalaya (04), The Assam Kaziranga University (05), Arunachal University of Studies (06), Indira Gandhi Technological and Medical Science University (7), CMJ University (8), Martin Luther Christian University (9), ICFAI, Shillong (10), University of Science & Technology, Meghalaya (11), ICFAI, Mizoram (12), ICFAI, Nagaland (13), Shri Ramasamy Memorial University (14), Sikkim Manipal University (15), ICFAI, Sikkim (16), Vinayaka Missions Sikkim University (17) and ICFAI, Tripura (18)

Table 2 revealed that the majority of library websites were given information i.e. about library 12 (66%) except Assam down town University, The Assam Kaziranga University, CMJ University, and Vinayaka Missions Sikkim University. 08 (44.44%) University Library website provides information about library rules and regulation excluding Assam down town University, Krishnaguru Adhyatmik Visvavidyalaya, Arunachal University of Studies, Indira Gandhi Technological and Medical Science University, CMJ University, ICFAI, Shillong, ICFAI, Mizoram, ICFAI, Nagaland, ICFAI, Sikkim and Vinayaka Missions Sikkim University, which was followed by 07 (38.88%) state universities gives information details of working hours/holidays and library sections. 05 (27.77%) of the library website mentioned library membership and library section whereas details of copyright, mission statement, news, domain, and library committee mentioned by 01 state private universities (05.55%) respectively. 02 (11.11%) of the university library website stated images gallery and download.

Table-3: Library Collection of State Private University Library websites

Library Collection	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	%
Books	✓	✓	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	77.77
Journals	✓	✓	-	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	66.66
Reference Sources	-	-	-	-	-	-	-	✓	✓	-	-	✓	-	-	✓	✓	-	-	27.77
Theses & Dissertations	✓	-	-	-	-	-	-	✓	-	-	✓	-	-	-	✓	-	-	-	22.22
News Paper	✓	-	-	✓	✓	-	-	✓	✓	-	✓	✓	-	-	✓	✓	-	-	44.44
General Magazines/Periodical	✓	-	-	✓	✓	-	-	✓	✓	✓	✓	✓	✓	-	✓	✓	-	✓	61.11
Conference Proceedings	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	05.55
Back Volume of Journals	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	11.11
Total Score (Max. 8)	6	2	-	5	-	-	1	5	5	4	5	4	4	-	7	4	2	2	

Table 3 represented that examines the availability of library collection information of state private universities. It had been found that fourteen out of eighteen university library websites were providing information about books. Journals were the second-highest collection given information in university library websites i.e. 12 (66.66%). 11 (61.11%) of state private university gives information about general magazines/periodical whereas 08 (44.44%) state private university stated the newspaper. 05 (27.77%) of state private universities revealed about reference sources and theses & dissertations mentioned by 04 (22.22%) of state private university libraries. Only 01 (05.55%) of state university libraries found having reference sources available and Back Volume of Journals provided information by 02 (11.11%) of the state university libraries.

Table-4: Library Services of State Private University Library websites

Library Services	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	%
CD Service	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	✓	16.66
OPAC Facilities	✓	-	-	-	-	-	✓	-	✓	-	✓	-	-	-	✓	-	-	-	27.77
Video View	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Nil
CAS	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	✓	-	-	-	11.11
ILL/DDS	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	05.55
Database Access	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	✓	11.11
Internet Based Services	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	✓	-	16.66
Reprographic Service	-	-	-	-	-	-	-	✓	-	-	✓	-	-	-	✓	-	-	-	16.66
Digital Library	✓	-	-	-	-	-	✓	-	-	-	✓	-	-	-	✓	-	-	-	22.22

Reference Service	✓	-	-	-	-	-	-	-	-	-	✓	-	-	-	✓	-	-	-	16.66
Circulation	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	05.55
Reading Room	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Nil
Total Score (Max. 12)	6	-	-	-	-	-	2	1	1	-	6	-	-	-	8	-	1	2	

Table 4 revealed that illustrate the information which type of library services provided by the state private university libraries. The majority of state private university libraries facilitated the OPAC service i.e. 05 (27.77%), which was followed by 04 (22.22%) state private universities mentioned information about digital library services. 03 (16.66%) of state private university stated information about library service provided CD Service, internet-based services, reprographic service and reference service, followed by 02 state universities given information about CAS and database access services 11.11% respectively, whereas 01 (05.55%) state private university provided information about circulation and DDS. None of the state private university provided information about reading room and video view services on their library website.

Table-5: E-Recourses of State Private University Library websites

E-Resources	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	%
E-Books	✓	-	-	-	-	-	-	-	✓	-	✓	-	-	-	✓	-	-	-	22.22
E-Journals	✓	-	-	-	-	-	-	✓	✓	-	✓	-	-	-	✓	-	-	-	27.77
E-Database	✓	-								-	✓	-	-	-	✓	-	-	-	11.11
CD-ROM Database	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	11.11
Video Cassettes	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	05.55
Institutional Repository	✓	-	-	-	-	-	✓	-	-	-	✓	-	-	-	✓	-	-	-	22.22
Total Score (Max. 06)	6	-	-	-	-	-	1	1	2	-	4	-	-	-	5	-	-	-	

Table 5 depicted the E-Resources available on state private university libraries' websites. The majority of state private university libraries website subscribed to E-Journals i.e. 05 (27.77%), which was followed by 04 state private university libraries website mentioned the information about E-Books and Institutional Repository respectively. It was observed that 02 (11.11) of state private university libraries website provided information about E-Database and CD-ROM Database, only one state private university stated information about the availability of video cassettes in the website. None of the state's private university libraries websites facilitated the new archive.

Rating Scale for State University Library Website

The five-point rating scale was fixed equally based on the maximum score 40 of Content features (Table 2 to 5 with 40 points) to rank the state university library websites, the rating scale was considered to rank "Outstanding" to "Needs Improvement" based on the five-point scale below (Table-6):

Table-6: Rating Scale for State University Library Website

Range (Score)	Rank
33-40	Outstanding
25-32	Very Good
17-24	Good
09-16	Average
01-08	Needs Improvement

Total Score and Ranking of State University Library Website in North East India

The total score of study State University Library Website is presented in Table 7 based on previous respective Tables 2 to 6 entitled "total score of State University Library Website websites in North East India".

Table 7: Total Score and Ranking of State University Library Website in north India

Name of University	T 2	T 3	T 4	T 5	Total Score (Max 40)	Rank
Assam Don Bosco University	8	6	6	6	20	Good
Assam down town University	0	2	0	0	2	Needs Improvement
Krishnaguru Adhyatmik Visvavidyalaya	1	0	0	0	1	Needs Improvement
Mahapurusha Srimanta Sankaradeva Viswavidyalaya	6	5	0	0	11	Average
The Assam Kaziranga University	2	0	0	0	2	Needs Improvement
Arunachal University of Studies	1	0	0	0	1	Needs Improvement
Indira Gandhi Technological and Medical Science University	3	1	2	1	7	Needs Improvement
CMJ University	0	5	1	1	7	Needs Improvement
Martin Luther Christian University	3	5	1	2	11	Average
The Institute of Chartered Financial	0	4	0	0	4	Needs Improvement

Analysts of India University						
University of Science & Technology, Meghalaya (USTM)	10	5	6	4	25	Very Good
The Institute of Chartered Financial Analysts of India University	1	4	0	0	5	Needs Improvement
ICFAI University, Nagaland	1	4	0	0	5	Needs Improvement
Shri Ramasamy Memorial University, Sikkim	5	0	0	0	5	Needs Improvement
Sikkim Manipal University	7	7	8	5	27	Very Good
The Institute of Chartered Financial Analysts of India University	1	4	0	0	5	Needs Improvement
Vinayaka Missions Sikkim University	0	2	1	0	3	Needs Improvement
ICFAI University, Tripura	5	2	2	0	9	Needs Improvement

It was observed that based on the total score obtained by the University of Science & Technology, Meghalaya (USTM) and Sikkim Manipal University got a "very good" cursory glance. Assam Don Bosco University and Martin Luther Christian University got "average rank" as per the ranking score of Table 7. As per the ranking score, Assam down town University, Krishnaguru Adhyatmik

Visvavidyalaya, The Assam Kaziranga University, Arunachal University of Studies, Indira Gandhi Technological and Medical Science University, CMJ University, ICFAI University, Nagaland, etc. did not get up to the mark of total score i.e. "needs improvement".

Findings of Study

From the present study following major findings and summary have been deprived: -

a) USTM 10 (71.42%) given information highest number of general information on the website such as about library, mission statement, working hour, library membership, library rules, library committee, library staff, library sections, and download, etc.

b) Sikkim Manipal University 7 (77.77%) provided information on the highest number of collections on the website likely books, journals, reference sources, theses & dissertations, newspapers, and the general magazine, etc.

c) Sikkim Manipal University 8 (61.53%) stated information highest number of library services such as CD Service, OPAC facilities, CAS, database access, internet-based services, and reprographic service, etc.

d) Assam Don Bosco University 6 (85.71%) provided information on the highest number of E-Resources on websites such as E-Books, E-Journals, video cassettes, and E-database, etc. None of the State's private university Websites not sharing new archives information available on the website.

e) Results revealed that none of the State Private Universities Library websites not integrated Web 2.0 and Web 3.0 Technologies on the website.

Conclusions and Recommendations

The library website is the mirror of any institute and organisation of their library services, basic information, collection, and disseminate

the lifelong learning process in the digital era. In this digital era of technology, online electronic resources, and online library services are very important tools for facilitating library services to users at any time at any moment. The website developer must develop more informative, up to date information, authentic information, user friendly and dynamic way, so that users must feel the satisfaction of libraries services provided by the Librarian. The library website content, structure, and design need to reflect changes in user behaviour, technology, and information resources. Based on the findings, State Private University Library Websites in North East India had not come up to expectations to users as virtual expressions of the quality level of academic excellence. The present study has revealed that none of the universities used Web 2.0 Applications for promoting library services. The researcher believes that State Private University libraries must give full users attention to the gaps and build soon a fully functional, dynamic, content interactive web portal with the help of Web 2.0 and Web 3.0 technologies. There was no financial constraint to adopt and implement Web 2.0 Technology in Library Website.

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The Impact of COVID-19 Crisis on Libraries : A Study

Leela Mohana Kumari Rongali[*]

Abstract :

Library is heart of the any institution (or) University. The basic aim of Libraries is to improve, expand and the professional knowledge in the Library and Information science institutions and research centers. This paper discusses various problems and solutions in libraries and also describes promote and improvement of Library services in covid-19 period.

Keywords:

Libraries, Covid-19, research, Information Technology, LIS Professionals.

Introduction:

The Covid-19 period of pandemic has challenged all our assumptions about the world. Global people expectations have been reversed. In this situation may be continuous to 12-18 months. Economic recession coupled with health fears as the virus ebbs and flows is going to be part of this new reality. The higher education institutions would reopen fully or partially before the end of this pandemic. Covid-19 has impacted on education, employment, energy, agriculture, and world economy. Globally UNESCO statistics tells that nearly 1.5 billion secondary school students and college students are unable to attend

* *Assistant Librarian, Damodaram Sanjivayya National Law University.*
Email : chirikileelamohan@gmail.com

school. ILO says that global unemployment increased millions of people.

In this context librarians should work to abreast with latest technologies. And during this covid-19 period, IT supplements play an essential role in the Library. Now days many concepts coined in the domain of Information Technology, such as Hybrid Library, open access, open education Resources, webinars, online classrooms etc. Most of the Library Associations provides a well established base for such international efforts. Every University Library need to adopt their philosophy and their traditional structure as well as it is also right for library and Information profession. They are providing a platform to discuss various issues and problems regarding the present situation of all academic level Libraries. The new normal in library practices personnel security, social distancing and sanitation of collections.

Objectives :

♦ To study the role of Libraries in the Covid-19 crisis period.

♦ To discuss how to maintain the Library in this pandemic situation.

The Impact of COVID-19 on Libraries:

In last few months, Covid-19 has rapidly and globally spread all over the world, in this situation Library Associations and Libraries are face the Covid-19 crisis. Libraries were lock down practically in all the countries although in different ways. Libraries and Library Associations are doing great job, sources and guidance of National level like a many of the Library Associations are creating a wonderful pages and they are trying to provide as much links from those pages to the resources, to the courses, to the webinars, to the online discussions. In this situation, that people really benefited out of those online resources. As for this, National Libraries are concerned to all different countries and different Libraries are joined in this. These webinars are great benefited to Library Professionals and Resources

Scholars and students. Libraries are promoting research in Pandemic situation during Covid-19 period.

Importance of Internet due to Covid period:

Information is also necessary now a days or earlier also. Internet playing a vital role in every where and people can`t survive without internet in this pandemic situation.

Digital /smart Libraries are allows to access huge depository information around the globe in digital format, full text of documents in many languages.

Recommendations and Guidelines of the Libraries:

Prepare the standard operating protocols which are needed for reopen the Libraries. Functioning in the Libraries may be in a restricted manner like few hours' maybe or hole day. Follow some protocols in our pandemic situation in different ways. In this situation, Libraries have lot of works and providing lot of services for the students and faculty members. Library Associations are providing services and support the functioning of Libraries through Social media.

There are some opportunities providing Covid-19 situation:

- Strange, unknown, weird, confusing.
- Mobility Restrictions.
- No News paper
- Risky

Library services in the new ways:

- Library closures and managing different approaches
- Reopening the Libraries
- Keep the returned books/ Library material in the Quarantine.
- Stay safe at home and also at work place.

- Reassigning the Library Resources.

- Actions by Associations, National Libraries and Library partners.

- Library support to handle social media and Fake news.

- Protocols for Covid-19 situations

Managing Different Approaches:

Libraries and Librarians are finding it difficult to handle different situations and many like to adopt one of the following approaches.

- Business (more or less) as usual or New normal.

- Some Restrictions.

- Minimal Services

- Full closure

- Preparing for Reopening, etc.

Government also announced. It is continue many months. We have entered in unlock down. This Virus is slowly extended. We have open for some of the services to survive with our economy, we have to manage minimum requirements of daily needs, So this situation is known as new normal.

Procedures to managing the Library in Covid-19 situation:

- Business (more or less) as usual or New Normal.

- Ensuring supply of masks and Hand Sanitizers.

- Thermal Scanning.

- Maintaining surfaces and Library Computers clean.

- Encourage staff and users to take time to recover if they are ill, rather than coming.

- Need to provide pages with useful links for the reliable information.

Preparing for Reopening Libraries: The New Normal:

- Staff Issues.
- Govt. Circulars, Institutional Circulars.
- Timings of the Library and staff.
- Disinfection and cleanliness of spaces.
- What other Libraries are doing.
- Sterilizer, Soaps, Napkins, Masks.
- Monitoring of staff and users physical health, social distance inside the Library.

They should not infected Virus we have to following these things.

Staff:

Staff are only called to come in if really needed and maintain the shifts to minimize contacts, ensuring that no more than 33% or 50% of the staff members are at any time.

- Ventilation of space is important.
- Staff should stay with a single computer.

Quarantine of Library materials:

Libraries are using Quarantine period of 24 to 72 hours before sanitizing and returning to the shelf as per the ALA recommendations. In these precautions we have to follow virus is disinfected.

Managing working Remotely: for Librarians

- Online Resources and Remote Access.
- Online meetings, webinars.
- Website, OPAC, Institutional Repositories.

- Subscriptions.

- Purchase orders, payments.

- Our main motto is managing Remote facility help our users to get all the services.

Remote xs facility :for students

Remote Access to E-Resources we have to give institutional login credentials then no one can misuse.

Action by Associations, National Libraries and Library Partners:

Library Associations have to set up pages with reliable sources and encouraged communication and coordination to share ideas and practice.

Almost all the Associations conducting Webinars and other media communication for conveying message to the users, many Library Associations are providing valuable information to Libraries about procedures for safe reopening.

General Protocols:

- Library working hours.

- Only currently enrolled students / faculty /staff is allowed to avail of the Library facilities.

- Thermal mission of body temperature is mandatory.

- All the users/ staff coming to the library need to wear masks and sanitizer their hands needed before entering.

- The users will use the separate staircases.

- Although not advisable but central Air-conditioning being used.

Conclusion:

Covid-19 has spread all over the world in just a few months. In this regard Librarians are face the challenges in Covid-19 crisis. It is observed that all the Librarians more attention on the current information services for providing the digital content to the students and faculty members. Libraries provide Remote Access facility for access the E-Resources.

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Digital Initiatives for Online Education and Library System in the Present Scenario

Dr. Meghna Dhar[*]

Abstract:

Recent technological initiatives has caused significant impact upon the online education and library system during the past few months and has ushered and taken us into an era known as Information Age. The world of education is witnessing tremendous change due to the development of Information Communication Technology (ICT). Application of ICT in online education has become inevitable at present times when all educational institutions in different parts of the world are facing complete closure due to COVID-19.COVID-19 pandemic has drastically disrupted the higher education to a greater extent. A lot of changes are taking place in our education because of its influence. It has transformed the centuries old class –room teaching model into one driven by technology. Online education during these days has been a boon for the education sector. It has maintained continuity in education and prevented millions of students from missing out from their academic curriculum. During these crises, the world is able to recognize the importance of online teaching and learning. The present paper highlights various technological Initiatives in support of online education and steps taken to over come various challenges during this period.

*[*] Assistant Professor,, Department of Library & Information Science,
University of Jammu, Jammu, Jammu &Kashmir, India
E mail: dhar_meghna@rediffmail.com*

Introduction

Over the recent years each new technological development that takes place impacts Education. ICT is a single innovation that has impacted the online education to a great extent. The information is a dynamic and unending resource that affects all disciplines and all walks of life. Information technology has not left any human activity untouched and without its influence. During the recent past IT has taken a new form to make human life not only informative but also comfortable. Owing to the restless efforts put in the scientists and technologists ,several new technologies have been brought up ,one such being the ICT, has brought revolutionary changes in the functioning of education system and modern libraries in disseminating information services to their users. With the advent of computers and advancement of ICT, the whole system of information has changed thereby opening up new possibilities in collecting, organizing, storing, disseminating, presenting, communicating and providing quick and easy access to vast volumes of valuable information resources at a faster rate.

Communication Technologies is the technology required for information processing, in particular, to the use of electronic, communication devices and software applications to convert, store, protect, process, transmit, and retrieve information from anywhere, anytime. Information and Communication Technology refers to all the technologies used to handle telecommunications, broadcast media, intelligent building management systems, audio-visual processing and transmission systems, and network based control and monitoring functions. Information and Communication Technology (ICT) has enhanced the workflow of the education system. Online education refers to any sort of educational practice that uses internet as a means of transforming information which can be done to many ways.

Information and Communication Technologies have revolutionized the modes and methods of teaching and learning. Now, information cannot only be stored, retrieved, communicated and broadcasted electronically in enormous quantities and at phenomenal speeds, but it can also be transformed digitally. The entire world is moving towards digitization .The digital revolution has evolved innovative changes in the online education system. In this time of pandemic crisis, almost all educational institutions are taking various steps in promoting and adopting digital education. Today, students are more inclined to find information by accessing the Internet through smart – phones,tabs and laptops.The professionals have to rethink and redesign their working from home. This is the time that they have own practices and literature which can greatly help our students to a great extent thereby enriching the knowledge of students as well as staff.

Technological Initiatives in Support of Online Education:

Due to the impact of COVID 19, there is a transformation happening across the world to teach the content through online mode. As the libraries across the world are under lockdown, therefore the libraries made their subscription free during lockdown period, thus making it available for all the people in society. The Ministry of Human Resource Development (MHRD), Government of India has started so many digital initiatives in support of Online Education Some of the most initiatives are:

National Digital Library of India (NDLI):

With the educational institutions shut due to lockdown, the National Digital Library of India reached out to its scholars and students amid covid-19 lockdown. National Digital Library is a platform of academic contents in different formats in all disciplines. It also provides interface support so that it can be easily accessed on all popular forms of access devices. The Ministry of Human Resource Development (MHRD) under its National Mission on Education through Information and Communication Technology (NMEICT) has

initiated the National Digital Library of India (NDLI) project to develop a framework of virtual repository of learning resources with a single-window search facility. NDLI is a platform of digital repository of academic content in different formats in all disciplines. These contents are freely accessed through NDLI's mobile application and its online portal https//:www.ndl.gov.Theeducational material is available in 10 languages and is authored by a large number of authors.
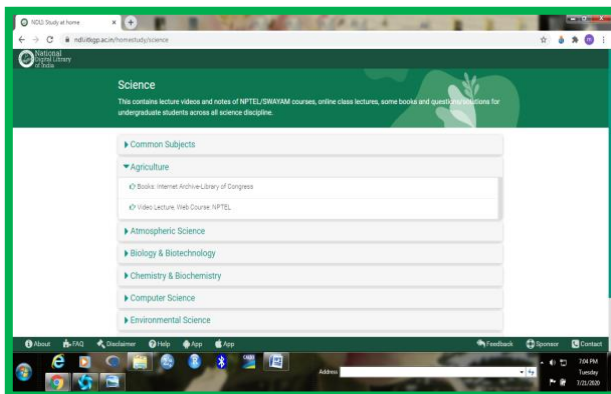
Screen Shot Showing NDLI Website

Source: Accessed from https:// ndl.iitkgp.ac.in/**Source:** https://ndl.iitkgp.ac.in/homestudy/science

on 14th July 2020 at 6.45pm

NDLI has designed a new section called COVID -19 Research Resource Repository (Scholarly Publications) of large number of educational and research Institutes which includes scholarly publications, data sets, documents and videos, journals and conferences, ideas and funding challenges and startup .These publications are of high quality. Lectures on NDLI, video you tube link are also available. Due to lockdown of educational institutions, NDLI has reached out to students with 7.8million content to enable them to study from home for which they have to register themselves to get complete access to the remaining content. The content is available in the form of e-books, audio-books, lecture materials, articles, reports; thesis and video lectures, journals, simulation tools pertaining to various subjects.
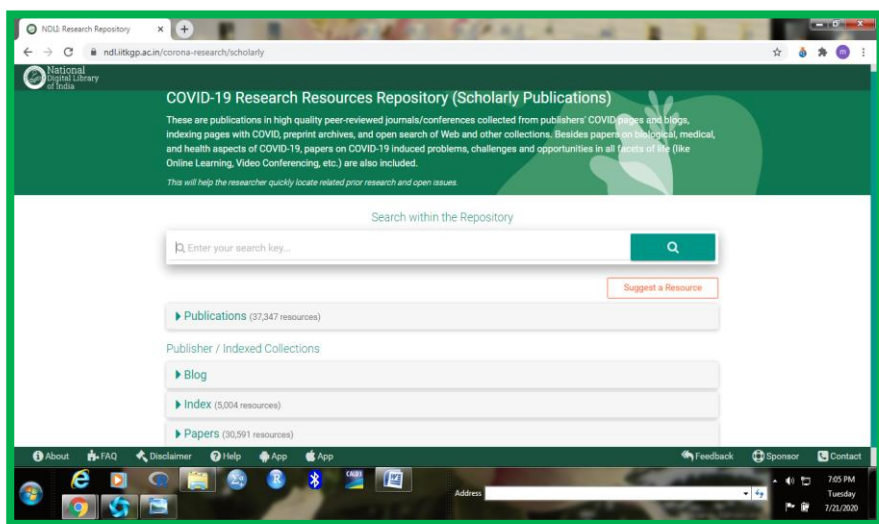
Screen Shot Showing New section called COVID -19 Research Resource Repositories (Scholarly Publications) of NDLI Website

Source: Accessed from https://ndl.iitkgp.ac.in/corona-research/scholarly

on 12th July 2020 at 4.46pm

National Science Digital Library (NSLD)

The National Science Digital Library (NSDL) was created by the National Science Foundation to provide access to high quality online educational resources and tools that support innovations in teaching and learning at all levels of science, technology, engineering, and mathematics disciplines. NSDL is a digital library of exemplary resource collections and services, organized in support of science education at all levels.
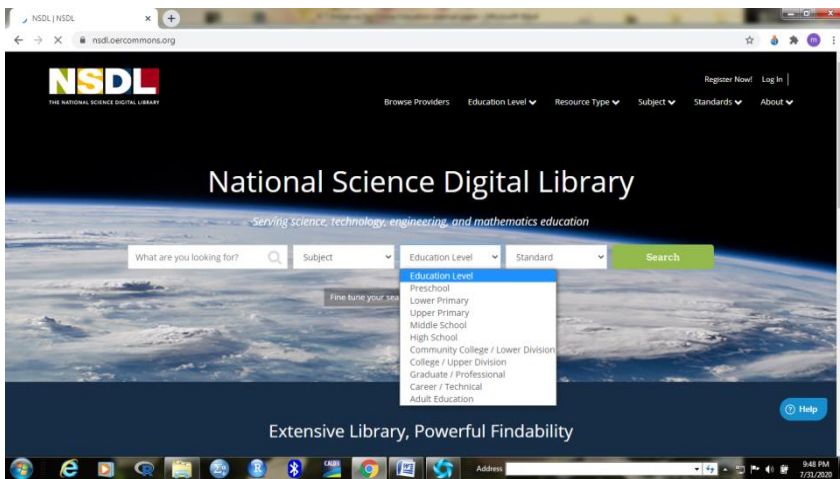
Screen Shot Showing NDLI Website

Source: Accessed fromhttps://nsdl.oercommons.org/

Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM)

SWAYAM, launched on 9th July 2017 by Honorable President of India , is an initiative started by the MHRD, under Digital India programme. SWAYAM is a Hindi acronym which means 'Self'. It is an Indian Massive Open Online Course (MOOC) .SWAYAM has been developed cooperatively by MHRD (Ministry of Human Resource Development) and AICTE (All India Council for Technical Education) with the help of Microsoft and is equipped for facilitating

2,000 courses. The platform offers free access to everyone and hosts courses from Class 9 till Post-Graduation and skill sector courses. It enables Professors and Faculty of centrally funded institutes like IITs, IIMs, IISERs, etc. to teach students. SWAYAM provides an integrated platform and portal for online courses, using information and communication technology (ICT). The basic aim behind this is to ensure that every student gets benefit from learning material through ICT. It is a mobile based interactive e-content for all courses and provides high quality learning experience by using multimedia at anytime, anywhere right from High School to University level. It also allows easy access, monitoring, peer group interaction and discussion forum to clarify doubts and certification. The development of SWAYAM involves of Massive Open Online Courses (MOOCs) which includes video and text based e-content. According to SWAYAM there are 203 partnering institutes, 2,748 completed courses, 12,541,992 student enrollment, 915,538 exam registrations, and 654,664 successful certificates.

Audio Systems:

Radio is considered to be the fastest means of communication that reaches to remote and far flung areas and also to economically weaker sections. Lectures and programmes can be easily recorded by subject experts and be broadcasted through radio. In present situation many listeners may not be in a position to afford costly equipment like smart-phones, laptops, desktops, and then pay internet bills, for them these recorded lectures are very helpful. During these days radio is also playing an important role by broadcasting online classes for those students who are unable to purchase smart phones or do not have any other facility for online education .In Jammu and Kashmir due to lack of high speed mobile internet services, education department has started radio classes on AIR local station to reach out remote and border areas.

Audio Visual System

The most powerful Audio-Visual media is TV cum LCD, electronic equipment which reaches its transmissions to millions of persons each day to far away places. It is an important source of dissemination of information. Besides, entertainment it is the best medium for educational and cultural messages which can be delivered to large masses. Various TV Channels telecast Tele-Classrooms. In order to disseminate online educational content to masses, the MHRD has launched is an initiative to provide 32 High Quality Educational Channels through DTH (Direct-To-Home) educational TV channels called "SWAYAM Prabha" broadcasting education content 24 x7 basis, and the content developed under SWAYAM is used for transmission in SWAYAM Prabha DTH channels. It has curriculum-based course content covering diverse disciplines. This is primarily aimed at making quality learning resources accessible to remote areas where internet availability is still a challenge. For standardizing the content delivery there is a need for good the quality of contents on these platform and in this view, for systematic development of the online courses for the SWAYAM, various guidelines are laid down for technical and production standards for the e-content which is available on website .The DTH channels are using the GSAT-15 satellite for programme telecasts. The SWAYAM PRABHA has new content everyday for at least four hours which would be repeated 5 more times in a day, allowing the students to choose the time of their convenience. The channels are uplinked from BISAG, Gandhinagar. The contents are provided by NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS. The INFLIBNET Centre maintains the web portal. All 32 channels are available at DD DTH and JIO TV mobile App.

e-PG Pathshalla

e-PG Pathshalla is an initiative of MHRD under the National Mission on Education through ICT (NME-ICT) being executed by UGC. The content and its quality is the key component of education system. It

provides access to e-contents in 87 under-graduate courses with 24,110 e-content modules. Each module includes e-text, Learn More, Self Learning material for Self –assessment which includes did you know, glossary, multiple choice questions, fill in the blanks, match the columns ,true and false, references for further study and video presentations which are designed by subject experts. So far e-PG Pathshalla has uploaded 22000+ e-texts, 19000+ videos, 3200+ experts,30000+ quiz ,70 subjects and 723 paper. The main purpose behind this is to make education accessible to every learner.

Screen Shot Showing e-PG Pathshalla Website

Source: Accessed from https://epgp.inflibnet.ac.in/ **at 7.54 pm 5/07/2020**

Other Platforms:

CEC –UGC You Tube Channel is a platform that provides access to the unlimited educational curriculum at free of cost. Professionals may create their own Blogs, YouTube channels to share and upload their audios and videos by displaying power point presentations of their e-contents .Even videos can be uploaded on Instagram, Twitter and

Face-book. Telegram app is also playing a great role in dissemination of information Theseare helpful for the students' community to a greater extent. Learning is a continuous process and new concepts about new technology can be learned from various videos available on You Tube. As a subject expert the professionals are in a better position to share their knowledge in much better way as they know better about the demands of users. Although the libraries are physically closed but librarians are working from their respective places by interacting with their users through e-mails or telephonically and are fulfilling the information needs of the users. Even the publishers are also giving free access to e-books to the users**.** Librarians can also provide technical support, LMS support, organize Audio /Visual Meetings and conferences. Libraries can also organize training sessions on support tools for education .A large numbers of libraries are organizing free webinars, curriculum based online quizzes for their users for which they are distributing e-certificates among successful candidates. Libraries can also scan curriculum based extracts with the help of teachers from text and reference books of library and send them to students through available resources.

Various Challenges

Educating and empowering the users in digital environment is a challenge for librarians which they have to face in transforming the libraries into digital world. For providing access to e –resources the librarians need to conduct orientation and virtual interaction with its users. While several educational institutions have started online classes, the network connectivity concerns, and concerns over the amount of additional screen time is of great concern. Everyone, particularly economically weaker sections does afford to purchase laptop, tab, Smartphone's. Sometimes phone calls interruption, electricity interruption is also a problem while attending online classes or webinars. To overcome this problem various education –based programmes is delivered on radio and television and are made

accessible to all and moreover this has easy connectivity even in remote areas.For successful implementation of ICT online initiatives the instructors must have solid understanding about the use of various ICT learning tools

LaptopSmartphone e-books,e-journals Tab
Figure showing Online –Learning Platforms
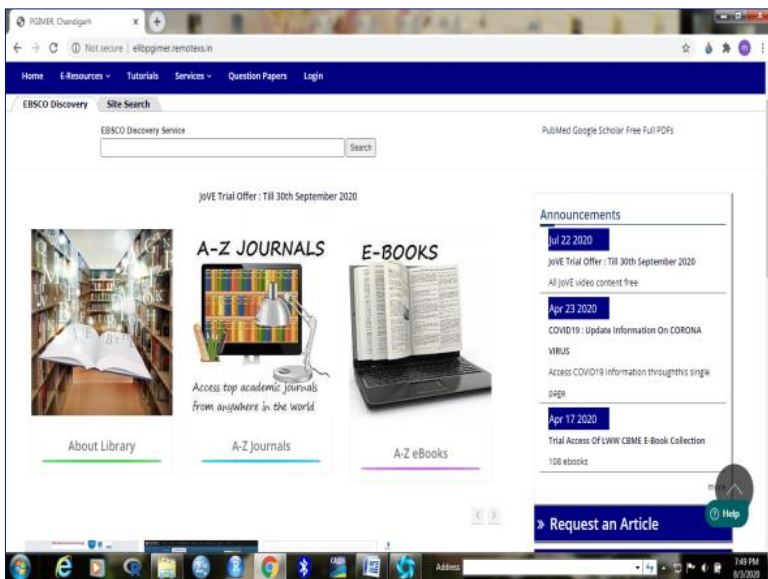
Screenshot of Website Showing Access to Full PDF Scientific Publications

of PGIMER Library, Chandigarh

Accessed from https://elibpgimer.remotexs.in/
on 14th July 2020 at 7.45pm

Conclusion

The use of technology for online education and all the digital initiatives have the possibility to revolutionize complete education scenario in coming future. Communication is very important key for success of any digital platform. Use of latest audio–visual aids and other innovative techniques can bring technological revolution in online education learning system but due to lack of desktops, laptops ,smartphone's and poor internet access facilities in remote areas and to economically backward classes for accessing information electronically will be a challenging task. To implement the technology for online education it is very necessary to improve the quality of teachers' on online training in order to acquire competencies and to increase their professional efficiency. It is through ICT that a large number of webinars, discussions, and virtual meetings are conducted. Even on social media we can do lot of exercises, chats, lot of activities and share data .More over access to everything is possible on internet and we don't have to pay anything. Internet has today become an agent of revolutionary changes and is one of the fastest tools to promote and to facilitate free access to online education. Today in pandemic situation it has emerged as greatest instrument of progress and has gradually become a gateway to global information or super-highway to information which is accessible 24 hrs. The use of online education has given new dimensions to teaching and learning process. The modern technology is applied in speedy retrieval of information most consistently. Thus, the use of Internet in online education has brought efficiency in development and delivery of e-content ranging from acquisition of documents to the retrieval of information as well as creation of knowledge. Thus the use of digital content and devices will surely improve teaching and learning processes for which we have to create such an environment so that it is easily reaches each and every learner.

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WordPress: A Tool for Website Development

Sheel Bhadra Yadav[*]
Vinit Kumar[**]

Abstract

In this age, having a website is essential for any organization. If a library does not have a website, it might be missing out on many users. It is also difficult for people to access the library due to geographical differences, so creating a website for the library is the best solution for making it available to the maximum users. To build a library website, WordPress has come up to be the best solution as there is no coding skill or programming required. This paper discusses the importance of WordPress for a Library Management System. WordPress has many benefits for both librarians and users. WordPress gives website owners the freedom to customize their website in a way they like, and it has a lot of user-friendly features. WordPress is also an excellent choice for creating a safe and secure website, which is the need of time.

Keywords - Content Management System, Library Website, WordPress

1. Introduction

Many libraries are still lacking their official websites in present time. The importance of having a library management system cannot be overlooked. An organization is losing out much development without having a website. These days, people prefer to know about what the organization is up to on their desktop before deciding whether to

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* Assistant Librarian, Dharmashastra National Law University, Jabalpur
** Assistant Professor, Babasaheb Bhimrao Ambedkar University, Lucknow
E-mail- asstlib@mpdnlu.ac.in

contact or not. A website builds the credibility of a business and confidence among customers that they are offering high-quality services. A Library Management System simply maintains the library's records. It contains all the books available in the library, how many books have been issued, or record of late fee charged and date of renewing or returning the book and other services available in library. The Library Management System has a handy database to record books and enter new books with submission dates. It also reduces the burden of recording everything manually for the librarian.

A librarian can maintain all the resources better and save time with the library management system. A librarian can also conveniently manage the allotment of books. The Library Management System helps students know whether a particular book is available or not. A library website is an essential tool for a new user to explore the services and resources a library offers without visiting the library physically. A big or small library does not matter once it has an online presence. There are so many libraries running without a website for various reasons. A library should have a simple and user-friendly website to present the complete view of its resources.

2. Background

This study encourages librarians to adopt digital ways to make their libraries more efficient and to stand ahead with changing technologies. Today's libraries have become more advanced and connected to the users. The end users do not want to actually go to libraries just to read and issue some books. They want to accomplish some general tasks digitally. With changing behavior of users, it is the right time for libraries to develop themselves in such a way that they can come up to users' expectations.

3. Web Content Management System

Having a web content management system is very vital for a library website. It is an application which records all the information on your

website. A web content management system provide tools for website authoring, administrative and collaborating tasks. In simple words, it is designed well to make the tasks of managing and creating a website easier even without having coding and programming knowledge.

4.1 Having a library website is essential

Having a website is very important to run a library in a very efficient way. These days, libraries offer a whole new and virtual passage to their offerings, i.e., their official websites. A library website should be aimed to provide the best services to its users. There are the primary aims of having library website –

- A library website is the most proficient and convenient way to visit a virtual library without actually being there.

- This system reduces all the burden of manual work as it manages all the processes digitally.

- A library website is user-friendly, relevant, and always up-to-date so a user can easily find what he or she is looking for.

- A library website is comprehensive in itself to display all the services and contents it has to offer.

- Only one person can handle the whole system without any risk of error.

- To provide an insight into the resources available in a library and services offered

- Provide a window to subject-oriented sources to the users and services to meet their unique requirements and provide different resources in various areas.

- To improve access to the library resources from anyplace, despite the geographical location of a user, and to overcome the challenges to access the resources of traditional systems.

- To make other resources available and provide personalized products like search guides and bibliographies.

4.2 The library management system has many benefits –

- It reduces paperwork and records all the books digitally.

- It facilitates librarians to update the details of books and manage records and the availability of books.

- It saves time and manual efforts.

- Customer can easily find and search their resources.

- There is no risk of data security and no doubt or stress of storing records and searching every book individually.

These days, a library website has become an essential part of library management system for school, colleges, university and all other libraries. A library website can give platform for issuing, renewal, and returning books. Besides, a librarian can maintain proper records of issuing books and returning before the due date.

5. WordPress Content Management System is Easy, Reliable & Complete Solution

The study gathers data from several top resources about the usage of WordPress. By considering the prior knowledge of authors and literature available, a checklist has been prepared about commonly used and expected features. WordPress is considered the top content management system worldwide, enabling users to edit, write, and publish content online. WordPress powers more than 4.5% of the whole web, and around 60% of CMS based websites are based on WordPress, according to statistics from Codeinwp.com. WordPress is being used by most of the top media channels in the world, such as TED, New York Observer, USA Today, CNN, Spotify, NBC, and others.

WordPress is free and easy to use CMS with several options for customization and features. It is possible to develop all types of websites with WordPress. It has many advantages to manage and maintain a library website. It is usable exactly when it is installed and does not require any coding and technical knowledge to operate.

The patrons can easily access digital content of the library using WordPress as a content management platform. WordPress's best part is that it does not need extensive knowledge and costly training for website maintenance. In simple words, WordPress is an open-source content management system designed to make editing, creating, and maintaining a library management system even more comfortable. WordPress was intended for blogging but is now used to develop a complete and fully-functional system/website/application.

WordPress is very user-friendly and easy to set up. It also has a vast community of librarians and users. It offers excellent controls to create content and set up several users. It has different themes, templates, and plugins to make statistics, contact forms, and photo galleries easier. When it comes to creating a WordPress website, a library has to choose WordPress.com vs. WordPress.org. WordPress.com is a dedicated commercial hosting solution where one can start an ad-supported, free website that consists of WordPress.org platform or buy upgrades to remove ads and improve functionality on its server. On the other side, WordPress.org houses a free and open-source CMS platform that can be installed on a website.

Here are some of the reasons why WordPress is considered to be the best CMS platform for libraries –

5.1. Constant updates on plugins

WordPress rolls out the latest software updates on plugins every 3 to 4 minutes. This way, your website always remains at the power and up-to-date with the latest technology. There are plenty of WordPress plugins to keep all library contents arranged. One can reorder, define

sequence, remove, add, or edit media content on WordPress websites with these advanced plugins. These plugins can automate many tasks like fetching information, arranging files, and bulk upload. Library WordPress plugins can quickly implement media information on a website.

5.2. Mobile-friendly

WordPress is the CMS platform that is well optimized for mobile users. Over the past couple of years, mobile usage has seen tremendous growth. According to a study revealed by Broadband Search, mobile traffic shot up in just five years by 222%, i.e., from 2013 to 2018. To gain an online presence for a marketer, a website should be well optimized to be mobile-friendly. WordPress does not require marketers to do anything else to improve accessibility to mobile devices. Many themes for libraries are optimized well for mobile devices.

5.3. Easy to customize with plugins and themes

It has found that a considerable population of marketers in the world relies on WordPress without being any programmers or developers. The thing is that WordPress does not require any specific design knowledge. WordPress is the best solution for non-tech users as thousands of website themes are available for free. Almost any type of website can have an ideal WordPress theme. WordPress themes have their official options panel, and they are easy to personalize according to the website's needs. This way, one can easily customize WordPress themes with options like uploading logos, changing colors, creating sliders, changing the background, etc. without any coding.

One can use different types of plugins to add custom functionality to WordPress. One can use WordPress plugins to add some features like contact forms, analytics, and membership area. Thousands of plugins are available for free and for a small fee. These plugins can add a new look to a library website.

5.4. WordPress is an Open Source Platform

Open-source platform allows anyone to modify the source code as per their convenience. Anyone can improve the current feature and come up with a new application. This way, WordPress has no limitations or restrictions. WordPress also has a dedicated community to keep the software updated without any license fees, unlike other tools.

5.5. Safe and Secure

Security is the best part of WordPress. Millions of people use WordPress, and hackers are not behind when it comes to getting through it. However, WordPress also has a big community to keep the security protocol most reliable in the industry. So, a WordPress website is always safe and secure against unauthorized access, cybercriminals, and hackers.

Creating a website takes much time, hard work, and money. With that in mind, the WordPress community provides robust security features to keep a website safe against all possible threats. For example, WordPress regularly rolls out its security patches to keep the website secured and provides powerful security plugins. Scammers and hackers are always on the lookout for loopholes in websites to hack and send malware. So, WordPress has a robust security team to improve security and provide the latest versions with bug fixes to prevent any vulnerability.

5. 6. Supports multiple users

Staying up-to-date and running a website needs the support of many people for larger organizations. So, WordPress enables multiple users to operate their website backend. Website owners can assign various roles to people as per their designation. WordPress provides six different roles for the users – Editor, Administrator, Contributor, Author, and Subscriber. A site owner has a right to choose whom to make what.

5.7. Quick to develop a library website

Many web developers agree that WordPress makes website development cycle even faster. It offers many user-friendly plugins and themes that provide faster development cycles and delivery, unlike old CMS software.

5.8. Switching to the desired host made easy

One can quickly switch hosting providers by choosing WordPress to create a website if they are not satisfied with the existing web host and its services. WordPress supports many leading web hosts. A web owner can easily switch the host without any downtime.

5.9. Easy to switch to WordPress

It is even easier to switch to WordPress from old CMS than ever. WordPress can export all the content, database, and media files with URL redirects. It is easy to add the current website design to the custom theme. All the crucial plugins can easily be installed to improve the overall user experience.

5.10. Supports multiple languages

It is another useful feature of WordPress for the library. This CMS enables users to create websites with over 70 different languages.

6. Conclusion

With the above discussion, it is concluded that library portals provide varied services to the users anywhere and anytime they want. Users can use a single platform to avail of all the crucial resources libraries have to offer. From this study, the findings will be helpful to know the importance of having a WordPress website for libraries. WordPress makes all things easier for the website owners and end users. It has all the functionalities to edit and manage the website and its contents. With all the above features and benefits, it is really worth having WordPress for creating a library website.

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Learning in Style; Knowledge at door Steps

Purushottam Kumar[*]

Introduction:-

India has witnessed several revolutions in the past and few of them are Blue revolution, White revolution, Yellow revolution etc. There has been a motive behind to start these revolutions such as Blue revolution is associated with Fish production, White is associated with Milk**and Yellow with the increase in production of edible oil mostly mustard and sesame seeds**.These revolutions have been initiated for the betterment of the country. Presently, Digital revolution has taken place in all verticals **namely banking, transportation,**health to connect the country on digital platform. TheEducation sector is also not untouched. It is an accepted position that Right to Education is one of the fundamental rights of the citizen of this country. For the growth of any nation, education always plays an important role and to **collect and gather** that knowledge at one place is the Library. **Rich library is the backbone for any educational institution**. Since ourchildhood the moment we hear the word "library", we always have this image in our mind of a big room which is full of books, but then introduction of e-library has changed the whole imagination of library.

Under the digital India Programme every citizen has to get high speed internet, easy access to common service centre, availability of service in real time from online and on mobile platform and universal digital literacy.

* Sr. Legal Manager,ICICI Bank,Patna
Email : purushottam.kumar2007@gmail.com

In this digital era, it has been rightly thought that library must be digitalised. One cannot be deprived of knowledge just because he cannot visit the library. Why one has to wait to access the knowledge and why knowledge will be accessed in fixed timing. **The concept was to make knowledge accessible and reachable at door steps. Because of the digitized libraries, access to knowledge is at a mouse click away.** Digital India also aims to provide the growth in different areas such as :- Broadband Highways, Universal Access to Mobile Connectivity, Public Internet Access Programme, e-Governance: Reforming Government through Technology, e-Kranti - Electronic Delivery of Services, Information for All, Electronics Manufacturing, IT for Jobs and Early Harvest Programmes.

Before we understand about e-library we need to understand the digital learning primarily.

Digital Learning:-

One of the recent initiatives taken by Government related to digital learning is e-Vidya. This scheme helpsstudents and teachers to get multimode access to digital education. **Diksha is another initiative that has been taken by the National Council of Educational Research and Training (MHRD, Government of India) which not only benefits teachers through digital learning**but also helpsthem to learn and train themselves for which assessment resources are available. It**provides a platform that** assists teachers to create training content, profile, in-class resources, assessment aids, news and announcement and connect with teacher community**which further helps in their professional development.**

They can use Diksha's features to create-

- In-class resources

- Teacher training content

- Assessment aids

- Teacher profile

- News and announcement

- Teacher community

Apart from the many advantages digital learning offers to the learners, it also helps to save money and to avoid construction of big and massive infrastructure. **Today there are so many institutions where there is dearth** of teachers and institutionsare spending crores to buy books so that they can be kept in the physical form. **This again raises a question as to the debatability of the fact , that physical form of book is better or digitized book**s. Well, in such situation it is apt to state as per (गीता का सार " परिवर्तन संसार का नियम है"), Change is rule of world. Most of us are adapting this and learning to use this platform.

The Massive Open Online Course (MOOC) is a self-learning source. This course has been designed to have interactive courses**and provide affordable and flexible way to learn new skills, supplemental learning and many more.**These programmes are designed in wonderful manner but seminal question is availability of laptops and internet connection **to such children who are devoid of such privileges and means. For them, road to digitized learning will not be so easy when their access to books in physical form is only full of obstacles. This is like providing all food materials to people but food cannot be cooked due to some reason or the other and so the hunger remains unsatiated**.Therefore, the whole purpose and initiative of the government gets infructuous and is fractured.

In this pandemic situation recently Honourable Delhi High Court while adjudicating one matter, asked the Centre and State government to respond to the petition seeking direction to provide free laptops, tablets or mobile phonestopoor kids so that they can access their online classes.

Digital Library:-

Digital Library simply means collection of books in digital format. **We have witnessed that digitized library has eased** the method to read the books of library but the process is not so easy. Before converting any physical book in digital format, scanning has to be done. In India, very few scanning centres have been made inside different universities. There arethree different stages involved in it:-

a) Pre-scanning process b) Scanning C)Post-scanning process

The pre-scanning process involves the following stages:

   i) Books are identified

   ii) Books are then submitted to the 'Digital Library of India' system for duplication verification

   iii) The system checks for the duplicacy and generates the barcode only for non-duplicate books

   iv) The barcode assigned books are then issued to the contractors for the scanning operation.

The scanning process involves the following stages:

   i) The books are scanned at a particular location or centre with an allotted scanning machine and an operator

   ii) The operator creates the structural meta information for the book he/she scans

   iii) The operator/ meta data entry operator enters the admin meta information for the books scanned on a particular day

   iv) The scanned books undergo processing and OCR along with quality control by the contractors/supervisors

   v) The scanned and processed books are copied onto the hard disks and DVDs

vi) The DVDs are submitted to the source / location/scanning centre

viii) The hard disks are brought to the central server location for web enablement

The post-scanning process comprises the following steps:

i) The contractors/supervisors upload the meta information obtained in two formats— Admin and Structural to the central server

ii) The system admin coordinates the meta information and the actual content obtained and allocates a server for the same

iii) The quality assurance team works on the content before they are uploaded onto the server

Government initiatives:-

A) **ePathashala**:- This particular project is the joint initiative of Ministry of Human Resource Development and National Council of Educational Research and Training. This has access to digital textbooks (e-textbooks) for all classesfor students and for teachers. One can also watch videos, can listen audios,**participate in exhibitions, workshops and research activities**, even maps and question banks are available. **This project proves beneficial to students, teachers, educators as well as parents**.

B) **eBasta** is a framework to make school books accessible in digital form as e-books to be read and used on tablets and laptops. The main idea is to bring various publishers (free as well as commercial) schools and students together on one platform.

C) **National Digital Library of India**:- This is again a great initiative taken by Ministry of Human Resource development. It is designed to provide support for all academic levels including researchers and life-long learners, all disciplines, all popular forms of access devices and differently-abled learners. It is being developed to

help students to prepare for entrance and competitive examinations. This project has been developed at Indian Institute of Technology Kharagpur.

When making move towards development in digital learning and its acceptance, it is mandatory to see that there must not be any violation of Copyright Act ,1957.

Few of the Suggestion for the innovation in Libraries:-

1. Server and data storage size must be increased so that big data can also been uploaded and same can be downloaded whenever required.

2. Artificial intelligence can be used so that reader can save time.

3. Use of Block chain, which helps to keep the data more secure, easy to use.

4. Library Bookmark app which features to help the reader to find the direction where the book is or keep the track on it. Easy to find the book.

There has been lot of challenges faced by other countries in other part of world.

The research on computer, learning, and teaching materials have really significant value. Still the value is fully realized only if the materials are assembled into professionally managed collections and maintained within time.

However, the more challenging is the mobilizing efforts behind those agendas, and in the digital library, given its commitment to maintaining legacy services and the dearth of R&D capacity, faces significant obstacle.

Conclusion: - Different countries' libraries are working to digitalise their library and empower their nation with Knowledge. We have also taken an effort and are working on it days and nights so that learning

and knowledge reaches ever corner of the country.. The digitalisation also helps us to overcome the language barrier. Today youth are techy savvy and they are more inclined towards the technology.Digitalised learning will have the greater impact on them. We have witnessed the success of most of the revolution which has taken place in our country and we are very much hopeful, this digital revolution will also set a benchmark paving the way for a revolution in the field of learning and knowledge.

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Z39.50 - Intermediary Role of Copy Cataloging: An Overview

Dr.Abu Waris*

Mr. Shakil Ahmad*

Dr. Akhtar Hussain**

Abstract:

This paper is enlightening briefly the role copy cataloging, Z39.50 protocol, catalog supporting tools (interpreters) for retrieving the MARC bibliographical records from Z39.50 utilities (servers) such as OCLC, Library of Congress, and so on into a library's local client system. The supporting tools of the Z39.50 catalog were able to access multiple MARC bibliographical records from the source databases by a single mode of a single click, edit, amend and add local holding data to their systems and import the data into their local system, based on client/server architecture and operation on the Internet. These instruments allow a range of global editing functions, a MARC metadata editor, UTF-8, Z39.50 built in, and SRU clients to interact with other library systems. They are intermediary and capable of saving, reducing cost, time, duplication of the shared environment work of the collectors, and there is a wide variety of free and commercial supports in the web-based Z39.50 environments. There are several free and commercial supportive tools are available in the current ITC era example MARC Edit, BibDataZU.

* Deanship of Library Affairs, Central Library, Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia

** National Institute for the Empowerment of Persons with Intellectual Disabilities, C44/A, IInd Floor, Sector-40,GautamBudha Nagar, Noida, U.P

1. Introduction

Considered that computers have changed library environments and revolutionized information retrieval by allowing additional entry points and quick system changes. The theoretical intent and organization of library catalogs have seen improvements over the last 150 years. They also shifted from small knowledge book lists to global indexes with comprehensive bibliographic records. Over time, improvements have been made in cataloging methods and technical advances, in the cataloging domain (Mason, 2009).

Ayres (2000) focused the "Time for Change: A New Approach to Cataloguing Concepts" Three factors suggested dramatic changes in library practice, an increase of electronic publications, the digitization of conventional library documents and a second information revolution on the Internet. Three forecasts are now gaining momentum: electronic publishing is a continuing practice in the publishing industry - the leading mode of publishing knowledge in the present world; it is also the digitization of traditional materials which has been adopted in any kind of library. Internet / online became the ultimate choice of every library, and of course the professional are compelled to adopt the technology in the working setup(Ayres, 2000).

Jeng (1997)& Hoffman(2009) explained the historical views of cataloging, the Anglo-American Cataloguing Code of 1908 signified the beginning of professionalization of cataloging, and later the copy cataloging movement brought significant changes by the emergence of Online Computer Library Centre (OCLC) in the functional approach for the cataloguers(Hoffman, 2009; Jeng, 1997)

Omekwu, John-Okeke, and Egberongbe (2007) Emphasizing the development of the MARC format, the Library of Congress in the 1960s made it technically possible for libraries to obtain and maintain

copy cataloging using computer technology. MARC has developed an international standardization for bibliographic description. Omekwu et al. (2007) The huge contribution made by MARC and OCLC to the success of ICT applications in describing the contents was also supported. MARC Z39.50 Library of Congress has made a landmark in the history of the catalog, made radical changes in its functional approaches and the processes for catalogers, Z39.50 MARC Bibliographic data has begun to be made available in a dynamic network environment through the Web for the search and retrieval of information(Omekwu et al., 2007).

Before the evolution of ICT (web-based), traditionally MARC bibliographical data's were available in the form of print, Magnetic tapes, later on, CD formats over the period, we made the revolution in the history of cataloging. The online catalog has changed traditional cataloging in several ways; the dependence on shared bibliographic databases for cataloging has increased copy cataloging and decreased original cataloging activities(Bazirjian, 2002; Johnstone, 2013). The Online Public Access Catalog made available the provision for searching and retrieved the MARC bibliographical records from its holdings, a listing of the library materials that can be retrieved on a computer terminal is called OPAC, and it provides multiple access points to the library's collection(Adeleke & Olorunsola, 2007; Osiobe, 1987).

Buckland (1994) speaks during1990s, eloquently in pointing out "the effects of linking online bibliographies to catalog records, begins to extend the bibliographic power of the catalogue beyond the dreams of catalogue code compilers, and to work effectively, the future catalog will have to be multi-tiered and flexible and adaptive in operation" (Buckland, 1994; Younger, 1997).

Copy cataloging uses the Z39.50 protocol to connect to, search and retrieve the requested information from the database(s) of the target library (Bibliotech). Described Z39.50 is a computer-to - computer

communication protocol designed to support the search and retrieval of information for full-text documents, bibliographic data, images, multimedia in a distributed network environment. The Z39.50 Protocol supports an increasing number of applications based on the Internet-based client / server architecture. And, like the dynamic network environment it uses, the standard is being developed to meet the ever-changing demands of creators, providers and users of information.The revolution of the Z39.50 protocol removed the barriers to sharing bibliographic records in the web environment and made it a good idea for catalogers to describe the contents(Moen, 1995).

To download bibliographical records from MARCeditor from the client system via the Z39.50 server databases, there are several catalog supporting (interpreters) tools, and plays an intermediary role between from database server to client system, example Marceditor, Bibdata, etc. These tools provide several global editing functions, provision of a metadata editor, full regular expression and UTF-8 support, Direct Integration with Supported ILS systems, etc. These tools allow the users to export their MARC data as delimited text; these interpreters includes a built-in Z39.50 and SRU client for interaction with other library systems(Mateen, 2013).

A number of accessible MARC bibliographic source databases, such as Library of Congress Catalog, OCLC WorldCat, British Library Catalog, NLM Catalog, etc., are available to librarians to decide and download MARC records through catalog support (interpreters) tools to complete the process (Eid, 2019).

2. Cataloging

The development of the catalog has its history from an ancient time. Several catalog and classification systems, codes, rules, and principles have been developed to describe the materials for a long time. As a result of working groups, committees, and professional organizations like IFLA, development of FRBR, NISO, the revision of codes and

principles adopted in the process of catalog by the late nineteenth century. The emergence of MARC Z39.50 protocol by LOC, for organizing the library collections is also added one. The contribution of different study groups particularly IFLA Study Group of Paris principles made an influence on cataloging, the radical changing approach of Library of Congress (LC) on the impact of technology, development of OCLC (Online Computer Library Centre) have opened up new vistas for the cataloguers to process the library collections. Chandel and Prasad (2013), stressed upon the contribution of professional associations and started the revision on working the codes and principles to cope with the changed situation with an impact of ITC. Globally libraries have started up to accept and adopted the established policies, procedures, standards for describing the materials, of various formats, to organizing the library collections(Chandel & Prasad, 2013).

New tools, techniques, and technologies to handle the changing scenario were needed to develop the information, expertise, and expertise community. By the end of the nineteenth century, many tools have been developed to organize traditional resources and have undergone a number of revisions over the years to meet changing needs. Earlier, the cataloging tools, originally produced in print format, have been transformed into other formats over the years, such as microforms, CD-ROMs, and the Web. Because of their ease of use and their upgrading, better display of data, and lower costs, libraries today show a clear preference towards online versions of these resources. Several new methods for managing digital web resources have also been created in the collection (Coates et al., 2001; Khurshid, 2003).

Omekwu et al .(2007) Opinions that shared environment catalog and cataloging instruments are critical for both localization and collocation. The library catalog is the essential interface or connection

between the client of the library and the library collection, as the position resources (Omekwu et al., 2007).

3. Copy Cataloging

According to Stone and Tam(1991) shows that the cataloging of resources like the OCLC came into being in the mid-1960s, enabling the mass exchange of MARC documents. Catalogers around the world have changed dramatically the essence of their career by handing over their full domestic expertise to reports on catalogs and embracing the work of global partners. Copying with OCLC would eliminate duplication by allowing librarians to access electronic documents that were already created by other organizations. Instead of a cohesive data set generated and managed by a single Index, most catalogs have become mishmash documents from multiple sources(Stone & Tam, 1991).

Cataloging is one of the key processes of any library that represents its collection, putting records in its inventory. This plays a critical role. Kao (2010) Describes that the library catalog is a record or a compilation of the library's collections, or of the electronically related collection of other libraries. This is either a community catalog or a joint catalog because it is a consolidated collection of the collections of various libraries(Kao, 2001). The duties include offering a complete list of library-owned items, listing what other writers own, on a similar theme and with a specific title, and making it easier for libraries to find material(Ebiwolate, P.B.2010, 2010).

Copy-cataloging is a method by which Bhatt and Mishra (2012), from an initial cataloging base such as OCLC World Cat (Beall &Kafadar, 2004), find a similar cataloging record for one object in hand (Chandrakar& Arora, 2010). Library of Congress, Dewey Decimal Classification, Arabic Union Catalog, etc. to edit the documents as needed, and to add the bibliographic records to the local holding information. By reducing duplication of effort, it increased librarian efficiency. One library generates a bibliographic record for an object

such as a book and many other libraries can download the data to local online catalogs, save the library's research, and link them to their program(Beall, J; Kafadar, 2004; Bhatt & Mishra, 2012; Ebiwolate, P.B.2010, 2010)

The librarian should be able to locate the record created by the source library to conduct the cataloging of copies, and another way to purchase records from commercial library service companies. Level 1 is copying a record, i.e. an exact copy of the original work. The catalogs take place on various levels. Level two is the use of a record of another library as a reference and changing or updating it to satisfy local requirements. If an exact match and originator is the description of the record, the OCLC 's World Cat usually copied the records without changing or adding local holdings, for instance, is a reputable source(PIZER et al., 1963).

Fischer and Lugg (2009) Estimated that 80% of libraries edit records in their local catalog for English monographs. Some edits are made "to fulfill local needs;" such as re-cutting, inserting markers, or deleting unnecessary element headings. The idea of merely accepting the work of another library remains widespread resistance(Fischer & Lugg, 2009).

4. MARC Z39.50

Computer, Internet supplementing and complimenting the library services, in multiple dimensions. National Information Retrieval Protocol (Z39.50/ISO 2350), a computer protocol that can be implemented on any platform, defines a standard way for two computers to communicate for information retrieval. Z39.50 implantation enables one interface to access multiple systems providing the end-user with nearly transparent access to other systems (Mark Kelly). The standard's maintenance agency is the Library of Congress (ANSI/NISO, 2020).

Z39.50 is a protocol that helps to scan and to retrieve information or documents from bibliographic databases (a special collection of procedures or regulations that defines the appropriate procedures of applications to communicate with one another). The Z39.50 protocol initiates and establishes contact between initiating client applications for the bibliographic records of another library (the server), checks the database or databases of the responding servers, and retrieves the specific information requested by the client. The recovered information is then returned to the customer application and shown or given for download (NISO, 2002)

The search syntax supports a variety of activities such as the quest, retrieval, sort, and navigation. A search with attributes, typically in the set bib-1, describes six attributes that can be used for searching computer information: the use, relationship, location, structure, truncation, and completeness. The Z39.50 protocol syntax makes very complex queries possible(Ebenezer, 2002).

Such resources save considerable time by requiring librarians not to reinvent the wheel and do it from scratch but to replicate the work carried out by others (Ex: Library of Congress, OCLC, British Library), to replicate the job. It is possible to extract the bibliography from the bibliography to the library system by using the enormous input from catalog support resources (interpreters). It is common for users to import single or multiple records from marc and text to a single file. Easy click Call Number Created Map, Globally Add / Delete Fields, Create Call Numbers, Validate Records, create ISBN or Title batch search (Egbailenamhe & Japhet, 2014).

5. Sources of Copy Cataloging

Congress Library; Cataloging in Publishing (CIP); Cataloging sources (OCLC). Cataloging sources. Also, sources of addition are various national and international catalogs of unions, national bibliographies of different countries. Besides, the Internet adds to the cataloging source. Commercial resources are available worldwide, including

academic libraries and research libraries, as well as public and private organizations, for migration of bibliographic records of MARC, various reputable Z39,50 databases are available. To select the sources of information, it is necessary, while downloading the MAR, to take care of relevant bibliographic records (like LOC, OCLC ward cat)(*Chapter 1 - Guidelines for Standardized Cataloging for Children | Association for Library Collections & Technical Services (ALCTS)*, n.d.).

5.1 Library of Congress:

The most extensive and commonly used sources for copy cataloging from the Library of Congress in book form. Automated libraries can subscribe to the Library of Congress cataloging records on MARC (machine-readable cataloging) tapes. Libraries will share MARC tapes with other libraries through a consortium arrangement. Currently, online services also made available on the web.

5.2 OCLC (Online Computer Library Center):

OCLC 's worldwide on-line catalog of library collections is the oldest and largest network of libraries. World Cat's online computer library center. In addition to libraries in the USA, OCLC also includes libraries from other countries. World Cat is a shared OCL member libraries' catalog and OCLC 's connection software on the www. Worldcat.org / website makes a copying cataloging facility of the database available for the member libraries. The OCLC database consists of MARC tape that contains both the library's cataloging and the libraries' cataloging. The most widely used source is OCLC. Released cataloging (CIP) (WorldCat, n.d.).

In most books published in the United States, cataloging information can be found on the copyright page, which is the back of the title page. This is called Cataloging in Publication (CIP), a project started by the Library of Congress in 1971. Over one million CIP records have been processed, and 4,500 American publishers currently participate in this

program. Even British Library, U K is also providing brief CIP in their publications.

5.4 Commercial Sources:

If requested, commercial book vendors namely Bro-Dart and Baker & Taylor …. and so on provide card sets at a minimum fee for all the materials on order for them. The sets are complete with cataloging information and provides along with the books or another type of media. The library service providing companies will also process the materials on demand and serving along with pockets and cards for each item, allowing immediate shelving after receipt by libraries.

5.5 The Internet:

The Internet has opened many views in the field of bibliographical regulation. Almost every big catalog can now be accessed via the Internet, many of which belong to clumps or clusters accessible in groups since the protocol Z39.50 binds them. These online catalogs can collect, view, and print MARC records with special software. You can edit the chosen MARC records by the program editor and pass them to the library system(Ayres, 2000).

6. MARC catalogue supportive tools (Interpreters)

The discussion was confined to support instruments for catalogs but not to any other specialized instruments for catalogues. In the migration of MARC bibliographic records from utilities, these tools make it easy for the catalogue to perform and avoid duplications by using global editing functions, the author focuses primarily on the application and their functionality. The author also works through these tools. They contain integrated Z39.50 and SRU clients, ISBN / Title search batch, marceditor, which can be used for interaction with other library systems. They allow catalogue operators to download MARC files in batch mode from the Z39.50 database with one click, edit files, add local data (Egbailenamhe & Japhet, 2014).

6.1 MARC Edit

MARC Edit (the updated version is 6.0) is developed by Terry Reese. MARC Editor, which provides several global editing functions, has Marc Edit 's built-in metadata editor. It includes full regular expression and UTF-8 support, as well as the ability to configure the editor to use any character set supported by the operating system. Extended functions: Globally Add / Delete Fields, Edit.(*MarcEdit Development*, n.d.)

6.2 BibDataZU

Setup of a Mark Call Number Tag. Delete unnecessary tags with just a button. (Tools-myMarc Profile for detail), templates: BibDataZU (Multiple databases with Z39.50 search, Marc record rating; Export from mark and text; Export Single or multiple records to the same server. ISBN / Title batch searcher, Marc editor. In BibDataZu's server default profile the Canadian National Catalog is included. Multiple encoding schemes support. The languages of BibDataZU's Marc, Faster Z39.50 search engine, English, Spanish, French, and Portuguese are completely supported.(Z39.50, 2020).

6.3 Z39.50 Server

The Z39.50 standard, which defines a protocol of computer-to-computer data retrieval, is national and international (ISO 23950). With Z39.50 a user can search and collect information from other computer systems on one system. The maintenance department norm is Congress Bibliothèque. Z39.50 is widely used and often integrated in library systems in library environments(Christian, 2001).

7. Commercial sources

7.1 Surpass copycat:

List of more than 200 libraries around the world pre-configured. Easy search links and searches for several libraries. When available, add new z39.50 sources. Before export, edit the complete MARC record.

If records are saved in a standard MARC file that is to be imported into any library system, users of Surpass can save records directly into the Surpass database. Surpass Copycat is a copied cataloging tool Z39.50 which enables users to free MARC records from the Internet to find and download them. At the same time, users can look up a variety of libraries, such as Congress Library, public libraries, health libraries, and catalogs for the state-wide union. More than 200 libraries are preset. Copycat also provides "Scan and Search" so that the user can immediately start the book search by scanning the EAN and ISBN barcodes of the book to be cataloged. Users can enter search conditions or scan bar codes for group search (Z39.50, n.d.).

8. Conclusion

MARC Z39.50 protocol has made an impact of cataloging during the 1960s by the Library of Congress, establishment of OCLC is another impact, the Internet, emergence of web services, availability of online catalog tools incorporation is one another development, new rules, codes, procedures, processes to describe the materials in the shared environment also be the ongoing development. On the impact of Z39.50, MARC Bibliographical data's were started to make available for sharing through Web versions (print to the online form), for the cataloguers, simultaneously, several bibliographical sources were also begun to provide the bibliographical catalog records, Ex: LOC, OCLC, British Library Catalogue, etc.

Library of Congress Z39.50 protocol made the task easy for the cataloguers to download the MARC bibliographical multiple records in batch mode at a single click. Copy catalog processes gained the momentum, in the shared environment, several online services (Web Dewey, Classification Web, Catalogue Calculator), are also been started by the LOC, OCLC. The ITC made drastic changes in its functional approaches and the processes for the cataloguers; copy catalog process becomes a routine function in every kind of library across the globe, it saves the cost, time, duplication of work.

Cataloguer's task made simple to extract the MARC bibliographical records from source databases through specialized catalog supportive tools (interpreters) such as (MarcEdit, BibDataZU) for the copy catalog process. Anybody can access the MARC multiple bibliographical records from the Z39.50 servers to the client database through these supportive tools, in batch mode and edit the records as much as they can and add the local holding information, and import into their system, the patron, can search the contents through their OPAC's.

Hence, the MARC bibliographical Z39.50 protocol and the specialized copy catalog tools (interpreters) are boon for the cataloguers, these tools play an intermediary role, in the shared environment, the success of the Z39.50 protocol in the online environment is boosting the process of the cataloguers in day to day routine function for the library materials.

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Role of National Library of India during COVID-19 Pandemic

Subhodip Bid[*]
Dr. Sukumar Mandal[**]

Abstract

This paper mainly highlights the different services offered by the National Library, India during COVID-19 pandemic. As under the advisories issued by Ministry of Health and family Welfare, Government of India reader's service suspended from 16th March 2020. But the National Library, India continuously giving service to the readers, academician, researchers in many way like promoting the open access resources, arranging webinars for the students and professionals, making integrated search portal for children and adults which help to find free educational resources and online registration for membership as well as for remote access of the subscribed e-resources of National Library.

Keyword: COVID-19, Pandemic, National Library India, Library Services, Remote access, Open Educational Resources

Introduction

It is the time in which whole world faces the COVID-19 pandemic situation and it force the countries to implement lock down for the benefit of the people. To overcome the COVID-19 problem all the

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* Library & Information Assistant, National Library, Kolkata
Email: subhodipbid@gmail.com
** Assistant Professor, Department of Library and Information Science,
The University of Burdwan, Burdwan
Email: sukumar.mandal5@gmail.com

countries try to invent the vaccine of COVID-19 for that all the countries of the world which are affected by this invest more and more on research. For the specific research the importance of the libraries for organizing and dissemination of the correct information increase day by day. During this period, Government of India emphases on free access of information to all the people. Many programme like National Digital Library of India (NDLI), MHRD project of IIT kharagpur and National Virtual Library of India (NVLI) initiated by Ministry of Culture under the National Mission Library. In this pandemic situation National Library, Kolkata give the service to the people of country in many ways. Due to the COVID-19 pandemic, readers service in all the reading room suspended from 16th March, 2020 and from 25[th]March 2020 all the sections of National Library was closed on except security division, cash and bill section and computer centre and again reopen only for the staffs of all the sections of National Library from 20th April 2020 as National Library follow the guidance of Ministry of Home Affairs and Government of West Bengal order time to time for opening and closing of the library. As the library is situated in Alipore, Kolkata and most of the time as it is in the containment zone.

Objective

The main objectives of the study

(i) Different Services offered by the national Library, India during COVID-19   pandemic
(ii) To explore the two discovery services

(iii) Steps for online registration through National Library portal for membership as well as to remote access of subscribed e-resources.

Services of National Library during COVID-19

a) Integrated Search Portal

For the benefit of the readers National Library started different services like online registration for the membership and for the readers who become member of the library can use the remote access the subscribed e-resource of National Library, free access the digitized document of **16633** National Library and many webinars have been arranged for the students, scholars and professionals.

National Library of India has designed two discovery service i.e. integrated search engine which help to find free educational resources from reputed publishers which is open access. It is also very much useful for the researchers to find all the information in a single platform like corona virus related information, link of different open access books, journals, video content, open educational resources , e-books, dictionaries, text books, magazines and many more. Integrated Search Portal links are given below

Open Educational Resources	https://nationallibrary.gov.in/home/open_educational_resources#gsc.tab=0
Open access learning objects for children and young adults	https://nationallibrary.gov.in/home/children_educational_eresources

Fig 1 : List of open access learning objects for children and young adults

Open access platform for access the digital content free of cost through different sites. The links of some important websites are given below

Sl No	Name	Brief Description	URL
1	**National Virtual Library of India (NVLI)**	It is project under Ministry of Culture, government of India. It provides free access to rare manuscripts, text books, painting and several other collection	https://indianculture.gov.in/
2	**National Digital Library of India (NDLI)**	It is project under Ministry of Human Resource development, Government of India. It is digital repository containing text books, articles, video, audio books lectures etc.	https://ndl.iitkgp.ac.in/
3	**Digital repository of West Bengal Public Library Network**	It has 35416 collections of rare books in digital format of different libraries of West Bengal	http://dspace.wbpublibnet.gov.in:8080/jspui/
4	**Internet archive**	Internet archive currently holds over 20 million books and texts, 3 million movies & videos, 400,000 software programme etc	https://archive.org/
5	**Hathitrust**	It preserves and provides lawful access to the 17 million digitized items.	https://www.hathitrust.org/

6	**Project Gutenberg**	It is a library of over 60,000 free eBooks	http://www.gutenberg.org/
7	**Open Access Library (OALib)**	OALib is currently hosting links and metadata to more than 4,370,631 open access articles covering wide range of academic disciplines.	http://www.oalib.com/
8	**Networked Digital Library of Theses and Dissertation (NDLTD)**	It is the networked digital library of theses and dissertations. It provides information and search engine for electronic theses dissertations (ETDs)	http://www.ndltd.org/resources/find-etds
9	**Open Access Theses and Dissertation (OATD)**	It is the resource for finding open access graduate these and dissertations published around the world	https://oatd.org/
10	**PQDT Open**	It provides the full text of open access dissertation and theses free of charge	https://pqdtopen.proquest.com/search.html
11	**Shodhganga**	It is the digital repository of Indian Electronic Theses and Dissertation	https://shodhganga.inflibnet.ac.in/
12	**Library, information Science and Technology**	It is free research database for library and information science students/professionals	http://web.a.ebscohost.com/ehost/search/basic?vid=0&sid=403991d7-

			bacd-47bd-94e6-cd4be5980b92%40sdc-v-sessmgr02
13	**NCERT textbooks**	The service covers textbooks of all subjects published by NCERTfor classes I to XII in Hindi, English and Urdu.	http://ncert.nic.in/textbook/textbook.htm
14	**Elphind.com**	It search all the worlds online historic newspapers from one place from 4,235 newspaper titles	https://elephind.com/

b) Digitized Documents of National Library, India

National Library has huge collection of the digitized documents which are very rare in collection and very much useful for the academician and the researchers **21291** numbers of documents have been digitized in 3 phase by National Library. Before this COVID-19 pandemic, National Library has some rules for reprographic services at reading room (https://nationallibrary.gov.in/ files/contents/rules_for_repro-graphic_services.pdf). Under this rules readers have to pay certain amount of money for taking the printout of the digitized documents but now it it is available free of cost for the readers and documents can be viewed and downloadable in pdf format. It is available through this link http://nlirepository.nvli.in/ of about **16633** documents as of now and also available through NVLI portal (https://indianculture.gov.in/ MoCorganization/national-library). As the process of uploading the document in NVLI sites is going on and remaining documents have been uploaded in short time.
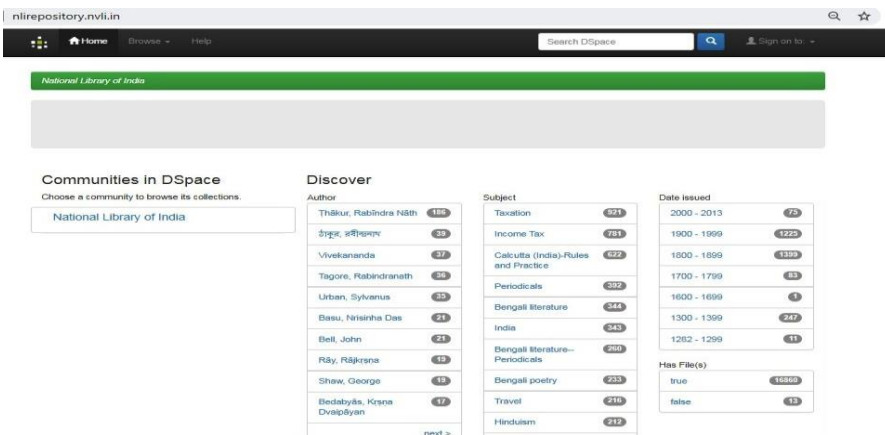
Fig2: Digitized documents of National Library through National Library official website (http://nlirepository.nvli.in/)

c) Online Registration for Membership and Remote Access of e-resource

During this period National Library avail to start the remote access facility to the readers, before this COVID-19 situation, this facility is only available for the different government organisations and libraries to access the subscribed e-resources of the National Library. The process of online membership registration for remote access of subscribed e-resources of National Library via ezproxy started on the last week of June 2020 for all the readers of National Library and till now more than 150 users have been applied for remote access facility. Following procedures are required for online registration to access the subscribed e-resource of National Library, India.

(i) Go to the website url (https://www.nationallibrary.gov.in/)->Click on Digital collection->Electronic Resources---> Click on to register for new user

(ii) Fill all the relevant details in the registration form with attached documents for age proof, photo and identity proof and click on "Register" button, message will appear that successfully registered.

(iii) A system generated user ID and link has been sent to the mail id of the user, which mail id has been used at the time of registration. End user has to click on the link within 2 hours to set the password.

(iv) End user now gets his dashboard, with the credential (user name, registration no. and and password)

(v) After getting the login id and password, click on the login option in National Library website

(vi) Now user get his own dashboard, after clicking on the digital collection->electronic resource, then again user Id and password and link (http://eresource.nationallibrary.gov.in/login) for remote access has been sent to the mail id of the end user.

(vii) User enter the username and password and able to access the remote access facility of National Library.

Fig 3: Remote access of e-resource

Conclusion

The present COVID 19 pandemic has changed all the method of learning and study. In this connection National Library of India is committed to give services to the citizen through different mode as the moto of the library is to give the right information to the right person at the right time by providing different services like free service for

the remote access of the subscribed e-resource, free access of digitized documents of National Library, arranging webinars on different subjects, making discovery tools for the readers. National Library also connected with social media platform like facebook, you tube and twitter through which any citizen can be able to know different programme, events, resources and services and it also allow the readers to connect with library. This situation also demand to improve and innovate the new mode of library services with the help of advancement of technology and like to promote the use of electronic resources and open access resources so that library can be able to maximize the use of resources during this COVID 19 pandemic. This paper explains the different services provided by the National Library of India and also the method by which the citizen can be able to access the electronic resources remotely.

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Research on the Application of Computer Technology in the Construction of Civil Engineering Projects

*Suhail Rafiq**
*Zubaid Hamid Rather**
*Aamir Hamid Rather***

Abstract

As huge scope far reaching building, structural designing has the qualities of complex innovation, wide selection and troublesome administration. Under the inspiration that the event of the structural building venture is increasingly troublesome and also the development scale is increasingly enormous, the standard manual administration mode has been slowly dispensed with. At present, so on guarantee the event quality and improve the event effectiveness, it's become the agreement of structural building endeavors to receive adaptable PC innovation and profoundly data the board framework in every development connection of structural designing. Consequently, this paper investigations the present problems with structural designing in arranging and development the board, and shows the actual use of PC innovation in structural building investigation, arranging and development the executives. On this premise, this paper investigates the longer term incorporation heading of PC innovation and structural building, and has made imaginative examination for the advancement

* Uttrakhand technical university, Dehradun, India
** University of Kashmir, Srinagar, India
E-mail : suhail.rafiq@ymail.com

of structural designing towards a heavy extent of information and knowledge.

Keywords: Structural Engineering, Computer Technology, Construction Management

1. Introduction

Differentiated and standard basic planning, one among the foremost clear headway characteristics of up to date structural building is that the obvious improvement of the data level. The compromise of upgraded PC propels has made a progressively broad improvement stage for the development of structural building. As such, the headway of basic structure shows the properties of up to date, widened and imaginative. At present, there are progressively increasingly conscious structure ventures in our country, and also the improvement size of structural designing is in like manner growing, anyway the contrasting planning organization level and concentrated headway level are commonly falling behind. Such a disproportionate progression mode conveys remarkable difficulties to the organization and advancement level improvement during the time spent turn of events.

2. Overview of civil engineering

The meaning of civil engineering

Generally speaking, civil engineering project work consolidates: the road, water, waste and flood control planning and transportation, etc [1]. In the field of structural designing, people once called all non-military basic structure ventures as basic structure, anyway with the cross coordination of various developments and basic planning, various subjects at first having a spot with basic structure have become an alternate request type. At present, from a confined point of view, structural designing, moreover suggested aggregately as advancement building, can be apportioned into interface, tunnel, geotechnical building and railroad building and other little extension substance.

Existing problems in Civil Engineering

At present, structuring topography and foundation assessment development are dominatingly field infiltrating reviewing and indoor examination test, which has certain obstructions [2]. In order to address the issues of present day huge degree advancement and the administrators, it is basic to use upgraded information development to make new examination systems.

With the extension of the difficulty of advancement, improvement mechanical assemblies, equipment and equipment supporting the basic structure improvement are making towards multi collections, computerization and immense degree, and the improvement technique of structural designing is logically moving towards mechanization and robotization. Under this establishment, the improvement structure and affiliation the administrators at this stage have in like manner began to apply the theories and procedures for system constructing, and are continuously consistent. This strategy can not simply deal with the advancement issues under special conditions, yet also make the past inconvenient improvement broadens modestly basic.

3. Integration of computer technology and civil engineering

The application of computer technology in geotechnical engineering

The stone is under the outside of the earth, which is commonly difficult to be observed clearly by the independent eye. In any case, PC reenactment advancement can show the technique and substance of the significant layer of rock and soil, and a while later produce unprecedented use and investigation regard. For example, a school copied the sedimentation of an estuary delta and set the conditions of the estuary, and a while later the watching programming can be used to show the sedimentation zone and the looking at thickness of residue of different sizes [3]. When in doubt, such an investigation is

outstandingly valuable to the improvement of the port and the burrowing of various conduits.

The application of computer technology in engineering survey

Investigating is the basic for ensuring the precision of structural designing works out, yet examining isn't just about running on the structure site with evaluating instruments, it in like manner fuses checking and checking of estimation bungles and land direct assessing, etc. Regardless, there must be a lot of data to oversee in each friendly structure study, which will possess a huge amount of time by manual figuring alone, and it is definitely not hard to convey counterfeit calculation botches. Using basic structuring investigating programming, for instance, CASS, can deal with these issues well. As showed up in Figure 1 is an instance of PC advancement in evaluating fundamental vibration expulsion.

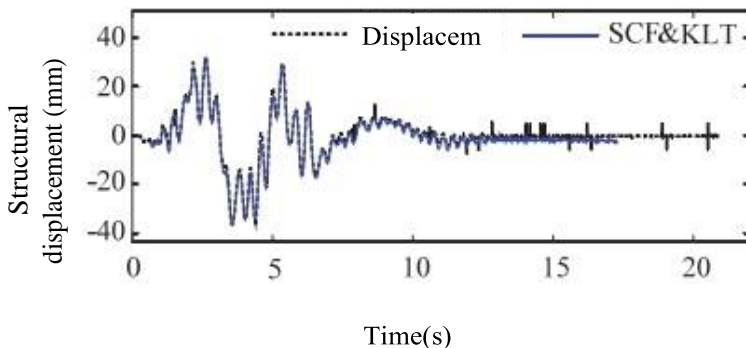**Figure 1.** Measurement of structural vibration displacement

The application of computer technology in civil engineering construction

In the improvement system of structural building venture, a reasonable advancement affiliation and plan can bring incredible stream technique for capital chain and extra improvement period [4]. By using the appropriate program, the advancement affiliation can be

better planned, and the improvement affiliation organize diagram, advancement affiliation bar blueprint and improvement configuration plan can be drawn quickly and definitely. Thusly, the advancement endeavors of basic planning ventures can avoid the nonsensical blueprint of HR and rigging in the genuine turn of events, and can moreover gigantically evade the occasion of the last item.

The application of computer technology in engineering cost

The use of each period of basic planning is inseparable from the figuring of cost, for instance, probability study, adventure evaluation, offering, the undertaking settlement, etc. In any case, due to the extensive impact of many cost issues, for instance, people, materials, and mechanical assembly, the cost of basic structuring has reliably been difficult to determine absolutely. In numerous pieces of the world, designs for the most part utilize structural building cost programming to assess the general expense of the undertaking [5]. The convenience and precision of building cost programming has a not too bad reputation in the basic planning industry. Its appearance can satisfactorily keep up a key good ways from various human bumbles and phenomenally decline the rest of the job that needs to be done of cost engineers.

4. Analysis of the development prospect of computer technology in civil engineering

Integration of virtual reality technology and civil engineering

The advancement size of basic structure is generally tremendous and the improvement time is long. During the time spent turn of events, it is definitely not hard to be affected by various components, for instance, human components and natural components. Furthermore, there are various associations in the advancement of structural building, and every association is immovably related. Notwithstanding which association isn't right, it will really impact the general improvement nature of basic structure [6]. Likewise, before

formal turn of events, the improvement adventure can use the reenactment reality advancement to replicate the basic structure site, and information all the data information drew in with the structural designing advancement into the PC produced reproduction system. By then the structure will cleverly survey these data and make a fitting improvement plot as showed by the evaluation results. The investigation shows that the advancement plot made by the PC created recreation structure is more reasonable and intensive than that made by man. At the same time, by reasonably registering the advancement cost and improvement time of basic planning, the increased experience structure can work out a tolerably huge cost convincing advancement plot. Moreover, the PC created experience system will look at every association of structural building improvement openly and clarify the association between every association of advancement, so as to ensure the advancement of basic planning a little bit at a time. Figure 2 shows an instance of the utilization of PC created reality development in structural building.

Figure 2. Application example of Virtual Reality Technology in civil engineering

Using computer to monitor the construction process

In the advancement methodology of basic planning, through the usage of PC development, pros can control the structure site condition persistently. Framework sensor can screen the condition of the structure site consistently, and input a wide scope of information of the structure site to the errand the administrators staff through the PC mastermind, so as to assist them with controlling the improvement situation in an all around way. In like manner, the usage of on the spot checking limits is helpful for the board staff to discover various emergencies in an advantageous manner and quickly take contrasting measures with ensure the smooth headway of the errand.

Formulate perfect information technology management standards

Broaden the advancement through GPS overall arranging, information system and far off distinguishing structure to moreover redesign the information improvement of structural building. Basic structure can use PC advancement to examine the topography and decisively dismember the genuine region rules. By then, as showed by the 3S particular standard, the far off recognizing standard in the advancement of the basic structure adventure is settled. Finally, mark in a short period of time to choose the improvement setup plan. The 3S information advancement standard can see high-precision, huge data bits of knowledge, quick arranging assessment, and comprehend the standard improvement of basic structure.

5. Conclusion

To sum up, the organization of basic structure is a stunning work. Right when directors work for all intents and purposes, they should not simply consider the quality and security of basic planning, yet likewise control the cost of basic structure ventures anyway much as could sensibly be normal, which propels higher necessities for planning organization. Along these lines, improvement ventures and

executives must take in new data from upgraded information advancement to comprehend the significant blend of information development and structural building, so as to give a solid specific foundation to the turn of events and the leading body of basic planning.

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Conception of Hybrid, Digital Besides Virtual Library, A Fundamental Methodology

Pankaj Bhagat[*]
Dr.SaiyeddFaheem Ali[**]

Abstract:-

For the most part the thriving assortment of books, reports, papers, broad media materials kept and sorted out for individuals to peruse or obtain in a library. Late advances in PCs stockpiling and handling, correspondence innovations, e-item, systems administration and web utilizes have acquired a progressive modification working of the libraries and its administrations. ICT has a great deal of effect on library and caused altered the idea of library where print and paper media are the primary segments of library framework. To meet huge data blast and appeal of data, libraries are currently changes in advanced library. Due to digitizing the library assets and quick evolving innovation, another kind of library is came in presence which is called-virtual library. A significant number of us are in every case particularly confounded about such phrasing of library. Right now attempt to free the idea from these libraries phrasing in an expert manner.

Keywords: Virtual Library, Automated Library, Hybrid Library, Digital Library, E-Library

* MLIS,PGDM, DIC, Ph.D. (Research Scholar, Madhav University)
** Ph.D. Library and Information Science, Research Guide, Madhav University
E-mail: spk9100@gmail.com

1. Introduction: -

We are in the computerized age, where each spot of data of any time is accessible in electronic configuration. Generally libraries were considered as the storage facility for books and accessible for lords and prestigious character of the general public. Far ahead on it is considered as library and data focus, yet with the development of ICT the idea of conventional libraries was changed, the books were supplanted by data and now data is for use for dispersal not for protection. Colossal progression in mechanical advancements occurring in the field of ICT, so the client request to change as indicated by change in innovation, to fulfil the need of clients and the library were moving from conventional libraries to computerized library, electronic library and virtual library. The ICT gives brief securing, putting away, preparing and dispersal of data with the assortment of significant worth included administrations. With the development of data blast and it is extremely hard to give right data to right client yet with the assistance of data innovation, we can without much of a stretch give right data to right client at opportune time. Presently a day, the data innovation contraptions, for instance, PCs, PCs, I-cushions are effectively accessible and broadly utilized by the individuals of the general public, so they need computerized data so they can get to whenever and anyplace, which are just given by advanced assets. A computerized library is an overseen assortment of advanced or electrical data with partner administrations, in which data are obtained, put away, prepared with the assistance of electronic gadgets and need a system to get to these advanced assets. Whereas a half and half library has both assortment, implies print sources (books magazines, and so forth) and non-print sources (digital books, e-magazines, and so on) and gives online disconnected offices to their client. There ought to be numerous meanings of an electronic library, computerized library, virtual library and cross breed library even they are synonymous to one another. We can say that Hybrid, Electronic and virtual libraries are present day libraries since they are entirely

unexpected from conventional libraries. The cutting edge libraries are:-

➢ Efficient and composed assortment of print and non-print assets.

➢ Digital in positions so that effectively procedure capable by PCs.

➢ The securing, stockpiling, scatters, and recovery of data is finished by the utilization of innovation.

➢ Right to use of whole holding of library is straightforwardly or in a roundabout way open over the system with the assistance of web.

➢ Backings and gives more and better online and disconnected administrations.

2. What is Hybrid Library?

Hybrid Library libraries comprise of regular print material, for instance, books, magazines, diaries just as non-customary or electronic based material, for instance, book recordings, e-journals, digital books, and so forth. Hybrid libraries are the new and developing term for the most open and scholarly libraries on the grounds that with the current administrations and assortment they can without much of a stretch offers electronic types of assistance or online administrations and effectively fabricate computerized assortments. Hybrid Library advanced during the 1990s with the rise of "data innovation", the electronic assets turned out to be all the more effectively accessible and broadly acknowledged for libraries to gain for open and scholastic use. These computerized materials were effectively open to material appropriated on media, for instance, CD's, DVD's or particular online disconnected databases. Presently, with the effectively accessibility of electronic substance, it incorporates Internet assets and archives which are on the web, for instance, e-diaries, e-records, and so on. A cross breed library requires staffs that are expertly prepared in the activity of electronic machines, for

instance, PCs, scanners, and so on and in looking of the tremendous measure of data accessible in the advanced age.

3. Digital Library:-

In digital libraries, administrations are completely robotized and all assets in computerized structure. These libraries are heterogeneous in nature and incorporate business related to data and how to digitize, store, discover, interface, envision, use, distribute, oversee and share data. Computerized library is an array of advanced processing, stockpiling and correspondence hardware together with substance and programming. In an advanced library there are for the most part two sorts of data: computerized: These data are carefully made and put away. Digitalized: Information is in physical arrangements (print group), with the assistance of suitable equipment and programming the data is changed over into computerized design or in electronic organization.

4. Electronic Library:-

The assortment of electronic materials in a library is known as an advanced library. An electronic library is a library where assortments are put away in electronic organizations (attractive tapes, microfilm jobs, CDs, DVDs, microform, or other media) and available by any medium, for instance, PC, workstations, I-cushions, CD player, DVD player and so forth. The electronic data or material might be put away in a disconnected server or online which might be gotten to remotely by means of PC systems. An electronic library comprises of each one of those electronic assets and furthermore electronic administrations. Electronic data can be named as every one of those advanced or electronic substance, which incorporate various simple configurations that expect power to utilize. An electronic library gives both on the web and disconnected administrations which spares client times and helps clients in the looking of their data otherwise book.

5. Virtual library:-

Right to use advanced data from the any piece of the globe through a system (LAN or WAN) or some other entryway for instance, web. The term virtual library is pulled in light of a legitimate concern for clients as a result of the expanding medium called the WWW (World Wide Web). The virtual library is the absolute generally reachable and significant wellspring of data on the planet and prompts substitution for the customary library. An assortment of connections is additionally a virtual library, these connections are a bit much possessed by the virtual library. Nonetheless, the connections are kept up, refreshed and oversaw as a typical capacity of the virtual library. A virtual library is a framework by which clients can get to data that dwells just in electronic organization on PC systems or frameworks with no physical limit of the data. The virtual library exists autonomously on the sum or nature of the electronic data to which it gives get to. There are no limitations on the degree, substance, configurations or cost of information in a virtual library. Its definition is moulded by individual or authoritative requirement.

6. Distinction among Electronic libraries and electronic library:-

These are the sorted out assortment of things of print (books, magazines, and so on.) and non-print (e-diaries, e-magazines, digital books, and so on.) alongside the administrations required to make them accessible to a given clients or gathering of clients. The significant contrast between half and half library, electronic library, advanced library and virtual library are as per the following:

➢ A hybrid library is a library comprising of electronic or non-print and print materials and administrations. Advanced materials can incorporate every single electronic material, just as an assortment of devices that involve power to utilize. For instance, video move tapes are a simple organization that utilization power or requires electronic machine to see. In this way, the "half and half library"

moves around all the material or assets that can in a "computerized library" and "Conventional Library".

➢ An electronic library is a library incorporates electronic substance and administrations. Computerized materials are those sources that are put away, prepared and moved by means of advanced or electronic mediums. Computerized administrations are administrations, (for instance, e-reference) that are conveyed carefully over PC systems.

➢ Virtual library are those library that are not, in actuality, it might be an assortment of connections, data's, which are accessible on a systems and open by means of web. Mixture and electronic libraries can be virtual libraries if their reality or nearness is just virtual or no physical presence, that is, the library doesn't exist, "all things considered". Perhaps the best case of a virtual library is the Networked Computer Science Technical Reports Library (NCSTRL).

➢ Move from customary library to present day library. The advancement in the field of library and data science are keeping taking spot and ICT have a great deal of effect on library administrations. The ordinary shut access of libraries are changing towards open access library. The open access framework libraries are moving towards computerized library, the mechanized one towards the gadgets. In all actuality no one recognizes what will be the eventual fate of libraries, as we as a whole realize that libraries are the developing creature.

7. Hybrid Library:-

The hybrid library in both computerized and customary (print) condition are known as half breed library. These libraries are in the middle of print and advanced condition. Perusing propensity for paper, simple to taking care of and perusing an advanced archives needs a medium, for instance, PCs, workstations, I-cushions, a few

people can't deal with these machines, so cross breed libraries are stopped great among the clients. It deals with the two sorts of client's for instance conventional clients (print structure) and present day clients (non-print structure).

8. Digital Library:-

This is well along phase of electronic library. In computerized library rapid information move happens, information were imparted through systems or web, it give a broad scope of Internet based administrations and it contains multi position data for instance sound, video, illustrations, conferencing and so on. The holding of an advanced library is in computerized structure and effectively open through web.

9. Traditional Library:-

The allotment or assortment of the traditional libraries are for the most part in print media, compositions and so on and are not efficient or characterized. The assortment in conventional libraries are breaking down quickly because of old methods of protection and conservation, the assortment of data isn't anything but difficult to follow, accessible thus doesn't effortlessly reach to client, Again the customary libraries are limited itself inside a dividers.

10. Automated Library:-

The automated library which offers programmed types of assistance, for instance, machine-intelligible inventory, modernized or online procurement, course and OPAC (online free index) are called as robotized library. The holding or assortment of robotized libraries are same as that of conventional libraries however the administrations offered by the computerized libraries improves them and provides more and successful administrations.

11. Electronic Library:-

These libraries connected by means of system, for instance, LAN (Local Area Networking), rapid downloading transferring access,

online data conveyance, giving CD-ROM organizing and began get to electronic diary and different sorts of distribution then it is known as electronic library. The assortments of the electronic libraries are in both print and non-print structure. The electronic structures are utilized for capacity recovery and conveyance of data.

12. There are numerous aspects about digital library as:-

❖ The web is the advanced library

❖ Completely mechanized library is advanced library

❖ The fantasy of a solitary advanced library or one-window perspective on computerized library assortments.

❖ These give progressively impartial access, anyplace, whenever.

❖ Digital libraries will be less expensive than print libraries

13. Points of interest:-

The present libraries are not encompassed to a specific area. The client can get his/her data on his own PC screen by utilizing the Internet. It is a system of compound access framework, which gives speedy data to numerous clients simultaneously. There are numerous focal points of having half and half, computerized and virtual libraries; a portion of the normal focal points are as per the following:

➢ **Without physical limit: -**The clients didn't require to go to the library; through web, they could get to a similar data from everywhere throughout the earth in a flash. he/she need to simply type the URL of the library and he/she can get all the administrations and data what he/she get in the libraries Which spares clients time, and each data is on single tick.

➢ **24*7accessibility:-** libraries can be gotten to whenever, 24 hours per day and 365 days of the year. All the computerized content is on the web so the data is accessible at 24 hours, since machines

don't think about day night, weeks, and months. Each data is accessible online without the regard of time.

➢ **Numerous gets to:-** similar assets can be utilized simultaneously by various clients. The clients can get to save a similar material at several of times with no troubles and simultaneously. It sets aside clients time and cash, which is affordable and prompts better administrations as indicated by client's needs and requests. Numerous gets to mean numerous clients utilize a similar asset simultaneously, or after some time. Be that as it may, in conventional libraries specific asset can got to just a single time by a solitary client.

➢ **Organized methodology :-** the substance of current libraries are a lot more extravagant than the traditional libraries and the assortments are in a sorted out manner for instance clients can without much of a stretch access the inventory and from index to the demanding book then from the book to a specific section, etc. In a library there are composed assortments of human information, so with the assistance of search we can without much of a stretch way to deal with our specific subject, and gather the data identified with the theme, we search the point in an organized way which implies that from a list to book at that point to record then from section so on, as indicated by our requirements we move from books to fundamental index or list.

➢ **Data Recovery: -** The clients can look or recover data with the utilization any catchphrase, which are identified with the word or expression of the whole assortment. Advanced library have easy to use interfaces, a single tick access to its substance. The clients can without much of a stretch pursuit any word, sentence, image, numbers with the assistance of interfaces called search box with the assistance of search we can experience our point. With data recovery it spares the client's time in looking of their data, speedy access to their subjects and simple to work.

➢ **Networking: -** These days libraries are bury associated with rapid web association, which is called organizing, sharing of assets should be possible through the sharing of connections. Clients need not required to go to library he can without much of a stretch access the libraries assets through web and utilize their administrations. Clients can without much of a stretch access numerous libraries database at a solitary snap since libraries shares the connections of others libraries joins which spares clients time and aides in the looking of their pertinent data.

➢ **Price: -** The use on keeping up an electronic, virtual library is a lot of lower than that of a conventional library. A traditional library need to acknowledge more consumption on the upkeep, staff and experts compensations, and so forth this can be compressed by electronic, virtual libraries in light of the fact that in these advanced libraries there are one time venture till the innovation changes and after that less experts requirement for the support of the library.

14. Difficulties/hindrances:-

- **Need:-**The PC infections, catastrophes, absence of institutionalization for digitized data, speedy debasing properties of digitized material, diverse presentation standard of computerized item and its related issue, wellbeing risk nature of the radiation from screen and so forth makes advanced libraries now and again handicap.

- **Band width:-** The necessitate high exchange rates for move of interactive media assets, yet the band width is diminishing step by step because of its over usage; and over-burden on the web. The moderate data transfer capacity prompts moderate download and transferring of computerized material, which implies clients need to give additional time in looking and downloading their substance.

- **Competence:** - with the data blast there is huge amounts of data on specific points, so it is exceptionally hard to locate the correct data on the specific theme. The validation of the data isn't unquestionable.

- **Surroundings: -**Present day libraries can't deliver the earth of customary libraries. Numerous clients likewise find that perusing printed data a lot simpler than perusing data on a PC screen. Because of absence of mechanical mindfulness, numerous individuals like to utilize print materials for perusing. Besides, the propensities are the serious issue.

- **Exclusive rights:-**Digitization restricts the copyright law as the substance or assets of one creator can be basically transferable by others without his insight. The fundamental test is that how the libraries communicate data alongside securing the scholarly properties of a creator. There are exacting standards regarding the infringement of copyright laws, yet in advanced period it is exceptionally hard to spare the scholarly property privileges of a creator or distributer.

- **Swiftness of admittance:-** as an ever-increasing number of PCs are associated then the heaps on the server makes site moderate. On the off chance that new innovation won't advance to take care of the issue, at that point in not so distant future Internet will be brimming with mistake messages. As we as a whole realize that the innovation is going more established step by step, so it's hard to give same speed of access on the grounds that computerized content incorporates sound, video, records which are of large in measure and require more transmission capacity speed.

- **Excessive Preliminary Outflow:-** The underlying expense of present-day libraries, for instance, the expense of programming, equipment, correspondence systems and different types of gear are exceptionally high. So it is over the top expensive for libraries to

buy them since libraries are not the benefit making associations, they are rely upon any organizations which gives assets to the working and running of the libraries.

- **Conservation:-** Due to fast change in innovation, libraries become outdate and its data may get out of reach. In future numerous new arrangements develop, so it is hard to safeguard the library assets at a standard configuration so that in future we may utilize it.

15. Result/outcome:-

In present days the concept of hybrid, automated, digital and electronic libraries is very much prevailing in whole world. It is need of the hour to have these libraries specially in higher institutions like universities, in India the libraries of colleges and universities are still lacking the enough resources to make their libraries digital and electronic the Indian libraries are still are focusing on the Print based libraries these should lay more emphasis on the converting their outdated libraries to the modern digital and electronic and fully automated libraries.

16. Conclusion:-

The virtual, hybrid, electronic and computerized libraries are the cutting-edge libraries, and they are equivalent words to one another. The cutting edge libraries won't supplant the physical presence of print assets totally however no uncertainty to fulfil the current need of the clients and change in innovation, to fulfil the clients request digitization must be presented so that in any event libraries is the fate of half and half nature and become in the pinch of its clients. The starter cost of digitization is high however explore shows that once digitalization is acquainted then the expense with oversee building up this assortment will be less expensive than that of any traditional library. Step by step, the expense of digitization is diminishing in light of the fact that the innovation going obsolete with all of time, the

online distribution is expanding, and the requirements of client are headed for the non-print sources.

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Traditional Library to Digital Library by Open Source Software : An Emerging Technological Innovation in Libraries

*Dibyajyoti Mishra**

Abstract: There is a dramatic change in the library administration and services by the library administration system based on information communication technology in the present era. This paper discussed about the advantages and disadvantages of open source software and also makes a comparison between open source software and commercial profit making software. Moreover a comparative study between traditional librarianship and digital librarianship and also find out the emerging technologies in library administration.

Keywords: Open Source Software, Commercial Software, Digital Library, Emerging Trends in Library Service,

1. Introduction:

At present world is full of emerging technology. Digital techniques has reform our official works, online banking, transactions, industrialization, education industry, business, healthcare, legal aspects, police, airline system & home management. As library is an essential part of our society, it is fairly touched by this technological change. The measure for the library management has increased. Concept and benefit of the library management have converted from the traditional library to the modern library. The methods of computer management have been used in library. Technology continues to

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* Assistant Librarian (Amity University Kolkata)
Email: Dibyajyoti_Mishra@Outlook.Com

rapidly emerge, changing the procedure of communication, industries outgrowth and information continuity. Libraries can grease these emerging technologies in providing new resources and services that match their patron's point of need location, device prepossession and information seeking behavior. Trending Technologies can also make libraries more productive, capable, skillful, and powerful in taking advantages of financial, staffing and space assets. These new electronic components also create supplementary demands upon busy library staffs.

Every library management or digital library management software, either free/open source software or commercial have some noticeable features. The five laws of library science have direct impact on library automation. To provide the particular facts to the right users, right way, at the right time should be the main motto of a library. The selection of software depends in various issues and open source software is one of the best alternatives among all others.

2. Objectives of the Study:

The main objectives of this study are given bellow -

- Find out the comparison between traditional library and digital library

- Find out the emerging technologies in library administration

- Find out the advantages of digital library over traditional library

- Find out the comparison between Open Source Software and Profit Making or Commercial Software

3. Open Source Software (OSS):

Open source software (OSS) which is allocated with source code that can be read and fitted by the users. The OSS society generally agrees that open-source software should meet the following criteria:

- The program must be openly shared.

- Source code must be constituted with the program.

- Anybody able to customize the source code.

- Customized form of the source code may be readjusted.

  The LIS society first initiated to take note of OSS in 1999. Daniel Chudnov, inventor of the open source system for libraries project, wrote an introductory article in library journal. According to the Chudnov there are three causes presuming the use of OSS in libraries:

- OSS allows libraries to cut allocation on software and use it to other issues demand more funds.

- OSS product is not locked into a single dealer.

- The full library community can share the liability of clear up information arrangements accessibility issues.

4. Advantages & Limitations of OSS:

4.1. Advantages:

- OSS is free of cost.

- Possibility of source code right to customized.

- Identify errors & fix them.

- Strong community service which improving explanation, recommend new conceptions & efficiency faster, better then the internal teams.

- Improvement according to requirement.

- Provides new forum for democratic action, combination, mutual interest without geographic and other barrier or bias.

4.2.Disadvantages:

- Some open source software may be sensitive to build up and use. Others may lack of user favorable combinations or configurations.

- Many type of profit making hardware need specially designed drivers to run open source programs, which are repeatedly convenient from the equipment manufacturer.

- With commercial software, the developers contribute payoff and warranty as part of a ideal license arrangement. Because the fully control and copyright the product and its hidden code. An open source software license commonly consists of only limited warranty and liability.

5. Implecations in Library Administration:

The improvement and the cooperation of the science and the technology have manufactured the quick enhancement of the human learning. The lesson and the fact have becoming the core point of the social progress, which makes the knowledge modernization develop into the hot spot of the worldwide consideration. The library administration is the crucial means of the knowledge diffusion and the knowledge modernization, which activate the community's consideration in the universe. The library administrations can metamorphosis kinds of fact from the institution into the knowing, which anticipate the human. The library administration bearing on the official regulation to the knowledge in sequence to generate, reach and use the lessons. The library administrations contribute the new way to understand distributing between the prevalent knowledge and recessive knowledge for the institution.

There has been an important enhancement in the technicalities and propensity in library in the past. The oncoming developing technologies will have a deep influence on library management, belongings, services and direction. Earning of information has to be

combined that were not otherwise get-at-able or usable because of technological obstacle, space, shape, system partition, or other boundary. New technologies must be constructed and realized them to make it practical for a distributed set of users to trace, give, and utilize that kind of information. The influence of this new technique and its global advantages has to be assess.

6. Basic Task iIn Library Administration:

- Purchase of library components.
- Select library materials.
- Stacks area care.
- Payment collection.
- Library Membership management.
- Library circulation.
- Serial control.
- Digital Library services.
- Plagiarism services.
- Report management & generation.
- Responding to any quarry.
- Approving and designing events Etc.

7. Comparisons of Traditional Library and Digital Library:

Traditional Librarianship	Digital Librarianship
Printed books & materials.	Books, online database, CDs DVDs and all type of digitized materials.
Balanced with slow progression.	Progressive, short lived & transitory.
Specific matter not straightly associated with each other	Multimedia and fractal matter
Face to face	Via Web

Controlled access points and systematize management	Endless access points, Shared assortments and access control.
One way interactions	Vigorous real time discussion
Complementary and worldwide access	Complementary as well as payment based
Librarian provide instruction on information literacy to the user	Provide instruction on digital information literacy to the user.

The above table is clearly stated that to move from traditional librarianship to digital librarianship application of ICT and library software is essential.

8. Advantages of A Digital Library Over A Traditional Library:

- Approximately limitless repository capacity at a much lower cost.
- Re-allotted capitals from some staff, collection maintenance and additional books.
- No physical borderline.
- Round the clock possibility.
- Numerous accesses.
- Raise fact retrieval.
- Preservation for some print materials.
- Supplementary expense.
- Worldwide accessibility.

9. Open Source Software and Commercial Softwares:

9.1. Open Source Software (OSS):

Today open source software is too trendy in community. The programme appliances are accessible over web to the general public.

It is also part of technical improvement with the combining attempts which is holding place over the world. Open source application is comparable to a peer review, which is used to the evolution of LMS. The open source software takes over from key control with collaborative chains of contributors. Some of the open source Library Management Software (LMS) given below:

1. Koha	2. NewGenLib
3. e-Granthalaya	4. PMB
5. Evergreen	

Some open source Digital Library Management Software (DLMS) are given below:

1. DSpace	2. EPrints
3. Fedora Commons	4. Greenstone
5. Drupal	

9.2. Commercial Software (National):

Profit-making Software are also popularized with favorable configurations, extra care and advanced machinery but the price of application, latest price, AMC fees, service issues and benefit taken by library. There are so many profits- making software growing in India to fulfill the alternative needs of library digitization.

1. AutoLib	2. EasyLib	3. SLIM
4. Librarian	5. SOUL	6. Libra 2000
7. Library Manager	8. LIBSUITE	9. Libris
10. Libex.Net	11. LIBSYS	12. Nalanda
13. NexLib	14. SWIRL	15. Gyanodaya
16. Biyani-Tecno		

9.3. Commercial Software (International):

On the international or worldwide podium there are so many profit making application planner who have advanced profit making software on worldwide level. Some of the given below.

1. DLib	2. Alice	3. My Librarian
4. CDS/ISIS	5. Endeavor Voyager	6. EOS
7. KeyStone	8. Millennnium innovative	9. Micro Librarian System
10. MINISIS	11. OLIB	12. Sagebrush
13. Mandarin M3	14. STAR/Libraries	15. Surpass
16. Techlib	17. TLC	18. URICA

10. Comparison Between Open Source Software And Commercial Software:

Some of the Open Source Software and Commercial Software are collected from above list randomly or popularly used for comparison analysis:

10.1. Feature and functions of the selected softwares:

Criteria	Koha (OS LMS*)	DSpace (OS DLMS*)	Libsys (CS National*)	CDS/ISIS (CS International *)
Developers	Koha community	MIT libraries & Hewlett-Packard (HP) Labs/ DuraSpace	LibSys Corporation , New Delhi	UNESCO

Started Year	2000	2002	1984	1985
Current Version	20.05.01	DSpace 7	Libsys10	Winisis 1.5 build 3
Type & License	General Public License	General Public License	Proprietary	Proprietary
Operating system	LINUX, UBUNTU, DEBIAN, WINDOWS	LINUX, WINDOWS, MAC OSX	UNIX, LINUX, WINDOWS	WINDOWS
Web Server	Apache	Apache	Apache	JavalSIS client
Language	Perl	JAVA	C	C & C++
Database	MYSQL	PostgreSQL, ORACLE	Bibliographic database ORACLE, MYSQL	MYSQL
Supported format	Open Office, PDF	Open Office, PDF	MS Office, PDF	Open Office, PDF
Modules	OPAC, full cataloguing, circulation, serials control, patron, management, report customization,	Material submission, Entry regulation, analysis support, distribution, preservation etc.	Acquisition, Cataloguing, circulation,, serial, article indexing, web opac, customization of report,	Define database, consists of required elements, Enter new records, reform database, retrieve

	membership etc.		membership etc.	record, print indexes & catalog.
Standards				
Cost (full features)	Free OS LMS	Free OS DLMS	10lakh +	----
Alert service	✓	✓	✓	----
Authority files	✓	✓	✓	✓
Biometrics	✓	✓	✓	✓
Copy cataloguing	✓	✓	✓	✓
Digital resources	✓	✓	✓	✓
Effectiveness	✓	✓	✓	✓
Expandability	✓	✓	✓	✓
Federated searching	✓	✓	✓	✓
Flexibility	✓	✓	✓	✓
Free user manual	✓	✓	N	✓
Multimedia files	✓	✓	✓	✓
Multiple platform	✓	✓	✓	✓
Networking	✓	✓	✓	✓

On-site training	✓	✓	✓	---
Reliability	✓	✓	✓	✓
RFID support	✓	✓	✓	✓
Security	✓	✓	✓	✓
User friendliness	✓	✓	✓	✓
Data entry templates	✓	✓	✓	✓
URL	✓	✓	✓	✓

Table 1: Feature and functions of the selected softwares

(*OS LMS: Open Source Library Management Software; *OS DLMS: Open Source Digital Library Management Software; CS National: Commercial Software National; CS International: Commercial Software International)

11. Conclusions:

Information & communication technique has changed the role of libraries to gain, keep up, handle and arrange information to the end user. The main objective of library digitization is to get quick entrance the main modules and activities of the library. The library activity in India is speedily growing and the traditional libraries are now on their way to automation in a phased process. In a developing country like India where resources are restricted, treasury is insufficient; the library personnel have to accept cautious and judicious conclusion in choosing library equipments. The librarian's role is significant in the choice of the fit integrated library administrative system according to the requirements of the users. Evolution of open source application is a new ray of hope in the field of library digitization. It grants so many

advantages for government institutions, private sector, and educational institutions.

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Research on the Application of Open Source Software in Digital Library

Mitansi Dobariya[*]
Dhruv Panjrolia[**]

Abstract

This study gives record and portrayal of Open-Source Software. In the development of advanced information center, utilizing OSS is a decent method to grab hold of the key programming improvement and innovation, remembering the huge improvement for open source programming frameworks, the mix of various open source programming frameworks and the combination of open source programming and different advances. In the execution of OSS, consideration ought to be paid to angles, for example, relative investigation of permit, the standard of permit use, the significance of normalization just as methods of dealing with the lawful dangers.

Introduction

A component of the upshot world over the previous years has been the ascent of Open Source Software (OSS) including utilization along with creation of OSS-names such as Google, eBay and Facebook [1]. Presently, such programming is expanding with its utilization in the library condition. The present libraries are confronted with the difficulties of incorporating conventional and developing

* Student, Vivekanand Institute of Hotel & Tourism Management,
Bodhigram, Kuchiyadar, Gujarat
Email: mitansi567@gmail.com
** Student, Vivekanand Institute of Hotel & Tourism Management,
Bodhigram, Kuchiyadar, Gujarat
Email : panjrolia86@gmail.com

configurations, adjusting asset designation among customary and up-coming advancements and building new data, board procedures and strategies. The blast of the web, the web and data innovation when all is said in done has given enormous chances for those working in library along with information professions in higher education. In this study we come up with useful information about software for colleges and universities introducing digital library conception.

Open source software

Open source software (OSS) is computer programming that have its hidden 'source-code' made accessible under a permit. An open-source previously advanced during the 1970s with Richard Stallman, from MIT who authored the expression "free programming". Richard and many more were getting progressively disappointed with the limitations of exclusive programming merchants, and the propensity for increasingly more important programming to be restrictive (shut source). Restrictive or 'shut' programming is claimed by the organization or person. Fig.1 shows the product's scientific classification:

Fig.1 A Software Taxonomy

Business firms will, in general, confine access to their source code so as to secure their licensed innovation. Duplicates of the 'paired' built open; the 'source-code' isn't generally open. Richard's vision was twofold: to urge more programming engineers to make their source code "open", and to make a totally open source programming stage – in light of the UNIX structure and reasoning.

In Open source software (OSS), the discharge of the source-code is twofold. Clients and engineers can be authorized to freely utilize and alter the code and to disseminate any enhancements they drive. But, the phrase 'free' in free utilization and alteration of the code was regularly misconstrued to signify 'no expense'. Henceforth 'open-source programming' was authored as a not so much combative but rather more 'business-accommodating' term. As indicated by the Richard Stallman's Free Software Foundation (FSF), 'free' ought not to be comprehended as "for nothing out of pocket" but rather as the client's opportunity :

 • To roll the program for any reason.

• To concentrate on how the program functions along with the adjustment done to a particular need.

• To reorganize duplicates of the first or of the altered program.

 • To be able to refine the program and discharge his enhancements to people in general with the goal that the entire network gain.

Access to the source code is a prerequisite for this (www.gnu.org/theory/free-sw.html). The Open Source Initiative (OSI) is the steward of the Open Source Definition (OSD) and some portion of its capacity is to survey and favour licenses fitting in with the OSD. A wide range of licenses fulfill the OSD, however, the kinds of commitments they force can fluctuate broadly. The OSD has created ten measures to decide if a permit for programming is open source (see Fig2.).

1. **Free redistribution:** the software to be available for distribution without payment.

2. **Source code:** the soft to be distributed with the source or well-publicized access to it.

3. **Derived works:** the license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.

4. **Integrity of the author's source code:** distribution of "patch files" used to recreate derived works to be permitted.

5. **No discrimination against persons or groups:** the license must not discriminate against any person or group of persons.

6. **No discrimination against fields of endeavour:** for example, it may not restrict the program from being used in a business, or from being used for genetic research.

7. **Distribution of license:** the rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.

8. **License must not be specific to a product:** license rights must not depend on the software being distributed with the other specific software.

9. **License must not restrict other software:** the license must not place restrictions on other software that is distributed along with the licensed software.

10. **License must be technology-neutral:** No provision of the license may be predicated on any individual technology or style of interface.

Fig.2 The Open Source Difinition

Use of open source software in digital libraries

Including the OSS and restrictive programming getting progressively intertwined, significant organizations, for example, IBM is empowered to utilize an overall network of engineers to ameliorate their items along with administrations. Some industry analysts propose that the OSS will prompt an increasingly serious programming industry. Currently over 67% of web-servers run open-source programming called Apache. Most of the sites and email frameworks run on the OSS. Around the world, around 30% of infrastructural PCs run on GNU/Linux, an open-source working framework. Libraries are additionally, as almost all associations, visit clients of open source programming, however, employees in libraries and different associations may frequently be unconscious of what number of standard library administrations are conveyed utilizing OSS alternatives. These days, advanced libraries give an incorporated arrangement of administrations for catching, inventorying, putting

away, looking, securing, and recovering data, which give a cognizant association and helpful access to a lot of computerized data. The OSS Library gateway incorporates various library-related tasks and a portion of these are nitty-gritty in Table.3. These range from basic contents to deliver insights to coordinated library frameworks to institutional vault programming. For example, CDSware, created by CERN; and Fedora, grew together by the University of Virginia and Cornell University, with subsidizing from the Andrew W. Mellon Foundation. Fedora - Flexible Extensible Digital Object and Repository Architecture – is an open-source advanced article archive the executive's framework that "shows how appropriated computerized library design can be conveyed utilizing online advances, including XML and Web administrations [4]. This article portrays DSpace, E-Prints and Greenstone Digital Library Software which are all generally utilized OSS for advanced libraries.

Table.3 The OSS Library Portal

Name	URL	Type of project
Uportal	www.jasig.org	The open source enterprise portal framework
GridSphere	www.gridsphere.org	The open-source portlet based Web portal
My Library	–	A Digital Library Framework and Toolkit
iVai	–	Based Web Digital Library portal
DSpace	www.dspace.org	Digital library software
E Prints	www.eprints.org	Digital library software
CDS invenio	http://invenio-software.org/	integrated library systems
Greenstone	www.greenstone.org	Digital library software
Apache	www.apache.org	Web server
PHP	www.php.net	OS programming tool
Linux	www.linux.org	Unix operating system
My SQL	www.mysql.org	Database
Mozilla	www.mozilla.org	Web browser
GIMP	www.gimp.org	OS image manipulation software
GNOME	www.gnome.org	Unix desktop environment

Greenstone

Greenstone is a set-up of programming for building and appropriating advanced library assortments. It gives another method of arranging data and distributing it on the cyberspace or on CD-ROM. It is created by the New Zealand Digital Library Project at the University of Waikato in the mid 2000s, and gives a set-up of open source programming for building and dispersing computerized library assortments. Greenstone has currently evolved and dispersed in co-activity with UNESCO and the Human non-administrative association. It is an open-source,linguist programming, given under the details of the GNU (General Public License). The Greenstone Digital Library runs under UNIX and Windows and expects to accommodate usability as clients can make records utilizing differing positions, for example PDF, Postscript, MS-word or ftp. There are five phases in building up an advanced library utilizing GSDL:

(1) Gather data.

(2) Outline the information.

(3) Design the assortment.

(4) Invigorate the assortment.

(5) Outlook the assortment

Running with leaving assortment Greenstone builds full-content files from the record content, and from metadata components, for example, title and creator. Files can be scanned for specific words, Boolean blends, or expressions and upshot are positioned by importance or arranged by a metadata component. There are a few different styles one of the client to discover data, despite the fact that they contrast between assortments relying upon the accessible metadata and the assortment plan. The framework is generally utilized globally the initial not many reactions to an approach the Greenstone mailing list for analyzers for another rendition of the product originated from

India, Pakistan, USA, Australia, Indonesia, The Netherlands and Canada. These days, Greenstone 3 is a finished upgrade and re-usage of the first Greenstone advanced library programming and consolidates all the highlights of realtor name/Procedia Engineering 00 (2011) 000–000 5the existing framework, and is in reverse good, that is, it can fabricate and run existing assortments without alteration. Written in Java, it is organized as a system of autonomous modules that convey utilizing XML. Various instances of libraries around the globe that have executed GSDL are given on the site (www.greenstone.org); these include Human Rights for Argentina, Kyrgyz Republic National Library, Philippine Research, Education and Government Information Network and the Sudan Open Archive.

E-Prints

E-Prints is additionally a case of open source programming for institutional vaults. It is overseen and created by the Electronics and Computer Science office at the University of Southampton and is unreservedly accessible as open source programming under the GNU General Public License (GPL). E-Prints was planned at first to make a pre-print institutional archive for academic research, yet is currently utilized for other material including reprints, specialized reports, meeting distributions or different methods for electronic correspondence. On its site (www.eprints.org) this OSS is portrayed as "an adaptable stage for building top notch, high worth stores. It is perceived as the most straightforward and quickest approach to set up storehouses of research writing, logical information, understudy propositions, and undertaking reports, sight and sound, showing materials, academic assortments, digitized records, displays and exhibitions". E-Prints written in Perl, needs establishment of the Apache browser and various modules, and utilizations the MySQL database as a back-end. Similarly as with E-Prints, the entirety of this extra programming is open source and unreservedly accessible. It was created under GNU/Linux and is expected to run on any UNIX-like

framework. E-Prints has been introduced and is running in more than 200 vault frameworks around the world. Most storehouses hold just electronic distributions, yet a number have been grown explicitly to help inquire about yield. These incorporate the Southampton Crystal Structure Report Archive, the National Aerospace Laboratories Institutional Repository, and the IUBio Software Archive. Simpson depicts the use of the E-Prints programming for the institutional vault at the University of Southampto**n.**

DSpace

DSpace is further-most well known open source application for advanced library framework intended to catch, hoard, file, save, and redistribute the scholarly yield of a college's exploration workforce in computerized designs. It was grown mutually by Hewlett Packard (HP) Laboratories and Massachusetts Institute of Technology libraries. DSpace is an OAI-consistent application is downloaded from the DSpace Web website under the BSD open source permit. Like E-Prints storehouses, DSpace vaults can be utilized for documenting both eprints and other advanced information; notwithstanding, DSpace places an accentuation on safeguarding of a wide range of computerized data, including Journal papers, Electronic proposals, Reports, Conference banners, recordings and potrayls.The DSpace design comprises of three layers: application layer; business layer; stockpiling layer. The application layer envelope the interface to the frameworks, the web and client and interface and group loader, specifically. The business layer contains the DSpace explicit usefulness, work process, content administration, organization, and search and peruse modules. Capacity layer is executed utilizing the social database the board framework Postgre SQL. Every module has a very much archived API and all unique code is in the Java programming language. Different bits of the innovation incorporate a web server and Java servlet motor, Jena (a RDF toolbox of HP labs), OAICat (from OCLC). The framework is accessible on Source Forge,

connected from twain the DSpace enlightening site along with the HP labs site

OSS Software Licences Issues

OSS and Software Security

To build the unwavering quality along with security of code, OSS relies straightforwardly upon the software engineer's ability and expert procedure, for example, peer survey, testing, quality reviews, alpha and beta forming and so on [5]. In any case, for the library' security authorization, top notch mastery is rare and may regularly must be created to sufficiently adapt to the expanded duties that OSS-based frameworks will require. Access to source code can likewise be a favorable position to an aggressor who can attempt to grow progressively expand assaults on the open source code. For instance by noxious designers who can introduce indirect accesses or other unfortunate performance may bring about monstrous information misfortunes in library.

OSS and Software Licenses

Almost all nations' copyright laws have for an age of increasingly secured PC programs by including them undergoing the class of abstract works for copyright grounds. In that capacity, the holder of copyright in unique programming has the selective rights to incorporate and recreate the copyrighted work and get ready subordinate works dependent on it. These days, Open Source Software (OSS) extension is set to increment. There are various sorts of OSS licenses. Notwithstanding, it combined with an absence of settled case law and quickly creating market place, so libraries ought to likewise think about their acquisition tasks to ensure they have powerful methods of confirming that code they purchase or permit in doesn't contain unforeseen OSS and extra vital legally binding spread.

Conclusion

The advancement of OSS in computerized library ought to comply with the fundamental thought which is receptiveness, cooperation and improvement. Open source portion not mean spare an organization the enormous measure of cash; the genuine expenses in the OSS's application include liences charge, improvement expense and upkeep expense. Be that as it may, probably the greatest favorable position of the open source model is that's all clients of the item can possibly add to its turn of events, inasmuch as the necessary open source abilities exist on staff.

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Challenges and Initiatives of Digital Libraries : An Empirical Study

*Mr. Amit**
*Ms. Sweta***

Abstract:

Digital Library is assuming a crucial job for spreading of data in present-day society. Every single library is gradually setting digitized. A digital library includes digital assortment, administrations and framework to brandish long lasting sneering, research, insightful correspondence just as safeguarding and protection of our recorded information. A Digital library is a cutting edge device to quicken innovative work for an association or nation. In the digital library, we can use the learning assets in a successful and snappy manner. In this paper, we are concentrating on the introductory framework of digital library and the challenges faced for the digitization of libraries. Some initiatives for digital libraries are discussed under this paper.

Keywords: Digital Library, Challenges, Digitization, Libraries.

Introduction:

Digital libraries include a wide scope of materials, from books to portrayals of three-dimensional relics. The substance is either made digitally or changed over from an assortment of simple sources through digitization. Broad digitization endeavors have coincide with

* Bachelor of Library and Information Science, Guru Nanak College, Budlada (Mansa) Email: - amitvalmiki090@gmail.com

** Master of Business Administration, Chaudhary Devi Lal University, Sirsa Email:- shwetaonline121@gmail.com

the development of digital libraries to change the abundance of customary academic and social materials held in libraries, documents, and exhibition halls into a digital configuration. The transformation procedure is a long way from complete. In any case, without precedent for the historical backdrop of recorded information, data assets can be liberated from physical transporters and are accessible in a uniform digital structure, paying little heed to their unique sources and sorts of introductions. A digital library is an assortment of archives in composed electronic structure, accessible on the Internet or on CD-ROM (minimized circle read-just memory) plates. Contingent upon the particular library, a client might have the option to get to magazine articles, books, papers, pictures, sound documents, and recordings.

Meaning of Digital Library: The expression "Digital library" isolated into two sections. One in "Digital" and another is "Library" Digital methods, data in any digitized organization and library implies, an absolute instrument for acquiring access to, putting away, sorting out and conveying data. In this way, the digital library is the library to gather the data with related administrations, where the data is put away in digital configuration like content, video, sound, and so forth and open over a system. According to R. Smith, digital libraries are "Controlled collection of information-bearing objects (IBOS) that are in digital form and that may be organized, accessed, evaluated and used by means of heterogeneous and extensible set of distributed services that are supported by digital technology"

Research Methodology: - The methodology of study is based on the empirical data. To prepare this study the data is collected through various books, articles and Internet sources.

Need of the study: - The study helps to know introductory details of digital library and challenges and initiatives under area of digitalization of libraries.

Objective of the study: - To understand the challenges and initiatives of digital library.

Challenges of digitalization of library:-

- In request to construct an extensive instruments, authentic materials now in simple structure (e.g., books, diaries, research facility records, sound chronicles, compositions, and photos) must be changed over. Today, the innovation for the digital transformation is, best case scenario, rising and regularly powers a library to pick between gambling harm to valuable firsts and delivering the most excellent proliferations.

- Giving access to library assortments is work serious. So as to apply scant assets to the digitization of critical amounts of the substance, it is frequently important to lessen the degree of detail offered in escort catalogs and indexes.

- In digital libraries such a significant number of PC are associated with the web its speed of access sensibly diminishing.

- Introductory expense of a digital library is high for example the expense of equipment, programming; renting correspondence circuit is too high.

- Because of the non-theoretical upheaval, a digital library can quickly become outdated and its information may turn into difficult to reach.

- Copyright is the most significant issue in the area of digital libraries. The idea substance of one creator can be openly moved by others without his affirmation in this way, digitization disregards copyright law.

- Perusing of written word to be simpler than perusing on a PC screen. Digital libraries can't repeat the condition of a customary library.

- The utilization of the digital assortment for getting to and recovering data will represent a similarity issue. Stunning advancements in the field of PC equipment and programming,

makes the issue of similarity in the usage of present day innovation with the ICT framework accessible in the library, albeit in reverse similarity is guaranteed by assembling firm.

- Libraries need to improve and update current specialized design for example, High-speed neighborhood system and quick association with the web, Relational database that underpins an assortment of digital arrangements, Full-text web crawlers to list and give access to assets, An assortment of servers, for example, web servers and FTP servers, Electronic administration framework

Several digital library initiatives in India:

Digital library of books

- Digital Library of India (http://www.dli.ernet.in/)

- VigyanPrasar Digital Library (http://www.vigyanprasar.gov.in/digilib/)

- NCERT Online Text Books (http://www.ncert.nic.in/textbooks/testing/Index.htm)

Digital library of manuscripts

- Kalasampada: Digital Library Resources for Indian Cultural Heritage (http://www.ignca.nic.in/dlrich.html)

- National Databank on Indian Art and Culture (NDBIAC) (http://ignca.nic.in/ndb_0001.html)

- Muktabodha: Digital Library and Archiving Project (http://www.muktabodhalib.org/digital_library.html)

Digital Library of Journals-Initiatives by Scientific Society and Publishers

- Open Journal System @ INFLIBNET

- Indianjournals.com (www.indianjournals.com)
- Medknow Publications Pvt. Ltd.
  (www.medknow.com/journals.asp)

Digital Library of Online Courseware

- NPTEL (www.nptel.iitm.ac.in, http://youtube.com/nptelhrd/)
- E-Gyankosh (www.egyankosh.ac.in)
- Learning Object Repository CEC (www.cec-lor.edu.in)
- E-PGPathshala (http://epgp.inflibnet.ac.in/about.php)
- Indo-German eGurukul on Digital Libraries
  (http://drtc.isibang.ac.in/mmb/)

National Digital Library of Electronic Thesis & Dissertation

- Shodh Ganga: Indian ETD Repository
  (http://shodhganga.inflibnet.ac.in/)
- Vidyanidhi Digital Library (http://www.vidyanidhi.org.in/)

Other Initiatives

- Traditional Knowledge Digital Library (TKDL) (www.tkdl.res.in)
- Archives of Indian Labour (http://www.indialabourarchives.org/)
- C-DAC Projects (http://cdac.in/index.aspx?id=mc_hc_digi_lib)

Conclusion:

The conclusion of the study that to digitize the traditional libraries there were many of the challenges faced by the professionals and general people as well. The underlying expense of digitization is high yet try appears that one's digitization is acquainted then the expense with oversee this assortment will be less expensive than that of any customary library. Step by step, the expense of digitization is diminishing and the online distribution is expanding, consequently,

the requirement for the client are moving towards an alternate domain that after one or two years the libraries should be digitized so it's the pick time to all educational and library proficient that they gear themselves to take the test.

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Mapping of E-books in Information and Communication Technology (ICT): An Analytical Study of Directory of Open Access Books

Dr. Sumaira Jan[*]
Asifa Ali[**]

Abstract

The present study aims to explore and analyze the current trends in publishing of e-books in the field of Information and Communication Technology (ICT).In order to achieve the objectives of the study, Directory of Open Access Books (DOAB) were selected as a source of data collection. The data is collected from 18-22th January, 2020 and later the data were analyzed using simple quantitative techniques to reveal findings. The result of the study found that majority of e-books (43.01%) are published between 2013-2017 while as, between 2018-2022 (40.86%) e-books has been published. These e-books are available in total of 5 different languages but majority of e-books have been published in English (93.54%) followed by German (3.22%) and Italian, Lithuanian, Spanish contributing (1.07%) respectively. The maximum percentage of e-books (33.33%) is available through unknown license whereas (32.25%) e-books are available through cc by-nc-nd license. The publishing trends reveal that (33.33%) e-books have contributed by Intech Open followed by (13.97%) and (10.75%)

[*] Department of Library & Information Science, University of Kashmir
[**] Research Scholar, Department of Library and Information Science, University of Kashmir
E-mail : asifalis100@gmail.com

e-books are contributed by MDPI –Multidisciplinary Digital Publishing Institute and Springer. The e-books are categorized into seven major subject areas of Information and Communication Technology (ICT).The maximum percentage of e-book is available on Social Science (26.88%), Computer Science (25.80%), Engineering (13.97%) and Science (general) (10.75%) respectively. The authorship trends reveal that maximum contribution is by single author (46.23) followed by two authors (24.73%) and three authors (15.05%) respectively.

Keywords: Open access, e-books, electronic books, open access e-books, monographs, directory of open access books, Information and Communication Technology.

Introduction

Present age is the information era rather the knowledge based era, which has led to information explosion in every sphere. Accordingly, this epoch totally changed the procedure of information storage, conservation, dissemination and all the more especially data recovery because of development and progressions in the field of Information Communication Technology (ICT) **(Khademizadeh, 2012; Saxena, 2009).** In view of information explosion, an emerging innovation known as e-publishing has become a base for the new-fangled information society to get the right information to the right person at the right time. Transformations in the publishing industry have an undeviating impact on the information systems and services. Since, ICT has changed the mode of publication in such a way that though the traditional sources of information continued to be flooded but with an attractive electronic form of publication. The eventual goal of electronic publishing is to provide fast and easy access to the information contained in the objective publications with simple, powerful search and retrieval capabilities **(Jan & Ganaie, 2015)** and among them one of the categories of e-publishing are e-books. However, prior to advent of ICT, there exists several limitations that

hamper the communication and transfer of information and knowledge which includes, lingual barrier, geographical barrier fiscal barrier etc. Consequently, to overcome these limitations ICT has paved ways for novel innovations that ultimately help the society to overcome and conquer these barriers for smooth and hassle free transfer of information and knowledge. In tune with same one of the novel innovations was the idea of Open Access (OA) that opened way for access to vast ocean of information without paying anything, nowadays Open Access (OA) is one of the drifting points among the discerning network of intellectuals **(Loan & Un-nisa, 2015)**. In this milieu, the amalgamation of e-books and Open Access opened new horizons of access to knowledge in the form of Open access e-books.

1. Literature Review

In view of immense importance of Open Access (OA) numerous studies have been carried out on the status of open access publishing in scholarly world. **Shah, Loan and Jan (2018)** are of the opinion that the open access concept was present in the minds of scholars long before but Budapest Open Access Initiative formally launched this movement. **Loan (2011)** while elaborating the concept of open access e-books defined it as *"a book in electronic or digital form that is available on the public internet free of charge, which can be read on a computer, laptop, or e-books reader".* **Rao (2004)** offers elaborative information on e-books that included their pros and cons in an educational context besides, describing how the publication of e-books on a commercial basis is steadily gaining impetus particularly in India. In line with same **Anuradha and Usha (n.d.)** observed that although the concept of e-books are not new, yet, their usage has been low, particularly in comparison to other e-formats viz; e-journals and e-newspapers. Emphasizing the significance of e-books **Rao (2001); Snowhill (2001); Tedd (2004)** reveal that e-books are simple to download, they don't go out of print like in case of print books, they can be personalized to go with individual needs, allow multiple access

simultaneously and are from threats of theft, misplace or wear and tear. However, on the other hand **Walters (2013)** highlighting the limitations of e-books state that *"preservation of e-books is very difficult because it requires long-term maintenance of several distinct elements: texts, file formats, software, operating systems, and hardware"*. Furthermore, a study by **Loan and Un-nisa (2015)** reveals about the current trends of the open access e-books in the field of science and technology available through DOAB.

Keywords: Open Access, e-books, Open Access e-books, electronic books, DOAB, Information and Communication Technology.

2. Objectives

The present study makes an attempt to explore and analyze the current trends in the publication of e-books in the field of Information and Communication Technology (ICT) available through the DOAB. The specific objectives of the present study are:

    i.   To analyze the time series inclusion of e-books.

   ii.   To identify the linguistic patterns in e-books.

  iii.   To study the license and publishing trends of e-books.

  iv.   To ascertain subject-wise inclusion of e-books.

   v.   To analyze the authorship trends of e-books.

3. Methodology

The DOAB has classified the e-books under various subjects. The e-books classified in the field of Information and Communication Technology (ICT) was selected for the study. The relevant data were collected from all Information and Communication Technology (ICT) e-books in the month of January, 2020 in order to achieve the set objectives. Later, data were analyzed using simple quantitative techniques and presented in tables to reveal findings.

4. Data Analysis and Interpretation

5.1 Year wise Growth

The time-series analysis of the e-books in the DOAB shows that the highest number of e-books in the DOAB (43.01%) is published between 2013 and 2017 .However, the projected percentage shows that it will almost double from 2018-2022 followed by (40.86%) followed by (9.60%) and (6.45%) e-books published during 2008-2012 and 2003-2007 respectively. None of the e-book published before 2002 on Information and Communication Technology. Meanwhile, the yearly growth of e-books is showing an increasing trend as shown in **Table 1.**

Table 1: Year-wise inclusion of e-books in ICT

S. No	Yearly growth	No. of E-books	Percentage
1	Below 2002	0	0
2	2003-2007	06	6.45
3	2008-2012	09	9.67
4	2013-2017	40	43.01
5	2018- 2022	38	40.86
Total		**93**	**100**

5.2 Linguistic Pattern of e-books

The Information and Communication Technology (ICT) e-books have been published in 5 different languages. The linguistic assessment shows that majority of e-books (93.54%) published in English language followed by German (3.2%) and Italian, Lithuanian, Spanish contributing (1.07%) respectively **(Table 2).**

Table 2: Language-wise publishing of e-books

S. No	Language	No. of E-books	Percentage
1	English	87	93.54
2	German	3	3.22
3	Italian	1	1.07
4	Lithuanian	1	1.07
5	Spanish	1	1.07
Total		**93**	**100**

5.3 License-wise Information of E-books

It is evident that majority of e-books (33.33%) is available through unknown license followed by (32.25%) and (15.05%) e-books are available through CC by -nc-nd and CC by -nc-nd respectively. Furthermore, it is also evident that the following license that that contributing less than (8%) CC by-nc, CC by-nc-sa, ANU press, CC by-sa, Duke University Press and Open Edition License for Books as displayed in **Table 3**.

Table 3: License-wise Information

S. No	License	No. of E-books	Percentage
1	Unknown	31	33.33
2	CC by -nc-nd	30	32.25
3	CC by -nc-nd	14	15.05
4	CC by-nc	7	7.52
5	CC by-nc-sa	4	4.30
6	ANU press	3	3.22
7	CC by-sa	2	2.15

8	Duke University Press	1	1.07
9	Open Edition Licence for Books	1	1.07
Total		**93**	**100**

5.4 Publishing Authority of E-books

The publishing trends reveal that most of the e-books are contributed by IntechOpen (33.33%) followed by MDPI –Multidisciplinary Digital Publishing Institute (13.97%) and Springer (10.75%). There are many other publishers contributing less than (5%) to the Information and Communication Technology (ICT) e-books to the DOAB as shown in **Table 4**.

Table 4: Publishing authority of E-Books

S. No	Publisher	No. of E-books	Percentage
1	IntechOpen	31	33.33
2	MDPI –Multidisciplinary Digital Publishing Institute	13	13.97
3	Springer	10	10.75
4	Frontiers Media SA	6	6.45
5	KIT Scientific Publishing	4	4.30
6	ANU Press	3	3.22
7	Taylor and Francis	3	3.22
8	University of Michigan	3	3.22
9	FrancoAngeli	2	2.15

10	Vytautas Magnus University	2	2.15
	Other publishers	16	17.20
Total		**93**	**100**

5. **Subject Coverage of E-books**

The e-books in the Information and Communication Technology (ICT) have been classified among 7 sub-categories. The majority of the e-books is contributed on Social Science (General) (26.88%) followed by Computer Science (25.80%) and Engineering (13.97%).Other sub-categories include Science (General) (10.75%), Media and Communication (9.67%), Business & Management (8.60%) and Medicine (General) (4.30%) respectively **Table 5**.

Table 5: Subject-wise publishing of E-books

S. No	Subject Categories	No. of E-books	Percentage
1	Business & Management	08	8.60
2	Computer Science	24	25.80
3	Engineering	13	13.97
4	Media and Communication	09	9.67
5	Medicine (General)	04	4.30
6	Social Science	25	26.88
7	Science (General)	10	10.75
Total		**93**	**100**

5.6 Authorship Trends of e-books

The maximum number of Information and Communication Technology (ICT) e-books have contributed by single authors (46.23%) followed by two authored (24.73%) and three authored (15.05%) respectively. The less percentage of e-books have also been contributed by more than three authors (13.97%) as shown in Table 6.

Table 6: Authorship trends in e-books

S. No	Authorship Trends	No. of E-books	Percentage
1	Single author	43	46.23
2	Two authors	23	24.73
3	Three authors	14	15.05
4	More than three authors	13	13.97
Total		**93**	**100**

Conclusion

The analysis evidently reveals that publication of E-Books in the field of ICT is augmenting steadily. In view of the fact it has been established that in current era electronic publishing has now become a strong base for the new-fangled information society in order to offer the right information to the right person at the right time. Since, ICT has altered the mode of publication in such a way that though the traditional sources of information continued to be flooded but with the attractive electronic form of publications. However, at the same keeping in view the immense importance of ICT as a specliazed subject area the publication of open access e-books is still in its progressive stage that needs to be enhanced for their successful adoption throughout the globe.

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Massive Open Online Courses (MOOCs) A Boon to Modern Era of Education for Online Teaching-Learning

*Nilanjana Purkayastha**
*Prof. Manoj Kumar Sinha***

Abstract

The emergence of information communication technologies, internet technologies, open access initiatives, open-access platforms, distance courseware, was developed and offered by various universities to their targeted students. However, these courses focus on the particular number of users or students instead of "N" number of students. In 2008, Stephen Downes and George Siemens offered a new avatar of Online learning which is known as Massive Open Online Course (MOOCs). Later on, which become the best way of providing education to the enormous number of students irrespective the traditional education system. Slowly MOOCs started spreading all over the world; many well-known universities have joined together to offer MOOCs, which can be accessed anytime anywhere without any physical boundaries. Due to the nature of allowing the users to participate in massive numbers, massive open online courses MOOC becomes different from other online learning courses and gaining popularity at a tremendous rate at worldwide level. Talking about

* M Phil Research Scholar

Department of Library & Information Science, Assam University, Silchar
** Dean , Swami Vivekananda School of Library Sciences ,
 HoD, Department of Library & Information Science &
Acting Librarian, Rabindra Library, Assam University, Silchar
E-mail : mksinha1965@gmail.com

MOOCs, MOOCs are excellent for promoting lifelong learning. They potentially offer much flexibility for people who want to complete their training in a particular subject or who want to gain new knowledge in a specific area. This study discussed the potentiality of MOOCs and how it becomes the boon to all the students, learners, skill developers and information seekers. This study provides necessary information about MOOCs, various platforms, and software for developing MOOCs. MOOCs is a very new concept and in India, it is under developing process, though the MHRD of India under the maintenance of INFLIBNET has launched a brand new Platform of MOOCs called Swayam, it will take some time to reach in the mind of masses and professional citizens of India. For spreading the concept, MOOCs/Swayam the Govt. of India has been conducting many awareness and training programs of MOOCs to ensure the concept of MOOCs /Swayam reach every corner of India.

1. 0 Introduction

MOOC came out from the continuous development of distance education and online learning. The advent of MOOC is not sudden, it appears from the various phase of distance education and online learning, or we can say distance education has given birth to online education. Online education paved the path of a massive open online course. Distance education has a long history dating back to the correspondence schools of the around 19th century.

MOOC stands for Massive Open Online Course, came into existence in the 21st century out of online learning, since major U.S. universities provided then many MOOCs. MOOCs have a concise history; it grew out of the confluence of distance education and the potentiality of the Internet in the late 1990s and early 2000s. Dave Cornier and Bryan

coin MOOC and Alexander in 2008 for their course Connectivism and Connective Knowledge which tries to cover some paid students and online students. After that, several universities in the US created MOOCs like, Stanford University professors started offering their

courses online. Further, Sebastian Thrun, Professors Andrew N G, and Jennifer Widom offered Introduction to Artificial Intelligence online. Moreover, Sebastian Thrun would go on to found Udacity, Andrew N G, together with Daphne Kollerare, the founder of Coursera, one of the most massive MOOCs at present.

Beseeming the popularity of online courses many universities started creating their version of non- profit online class, some offered using their platform, and some join a consortium of universities formed platforms like EdX or Coursera to offer a course through online. Another brilliant MOOC platform is a Udacity, partnered with some specific universities to offer online courses. Likewise, many companies follow alternative business models or offer educational content differently, some of which are free while others cost money. MOOCs are just one segment of a growing industry of bringing together technology, learning, and the Internet. In this context, India has also stepped forward, and India has launched a new portal for MOOCs. The acronym SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds) to offer opportunities to students to learn anything from the list of 2000 courses, presently only 200 are available for registration.

1.1 Background of the study

At the present-day context, the MOOC platform has been treated as the most popular way used to offer online courses globally. MOOC is a massive course which is designed to support unlimited participation and offered through a platform. MOOCs are Online Courses designed to appeal to enormous numbers of participants, which can be accessed by any person sitting anywhere as long as they have an Internet connection. MOOC is open to all without any entry qualifications and geographical boundaries. A MOOC may offer full course experience with a certificate for free of cost or may cost minimum money. Importance and potentiality of Massive Open Online Courses (MOOCs) have motivated many universities to host Massive Open

Online Course, many universities have started offering MOOCs collaborating with other universities by setting up an open learning platform (MOOCs).

1.1.1 Type of MOOCs

MOOCs can be of different types as per their set of populations, aims, objectives, goals, and nature; a MOOC may be synchronous MOOCs, asynchronous MOOC, adaptive MOOC or maybe group MOOC and so many. However, there are two essential types of MOOCs is described below:

To distinguish between the two MOOCs, Stephen Downes proposed the terms **cMOOCs** and **xMOOCs.**

In cMOOCs, c stands for **connectivist**, which depicts the nature of cMOOCs. Connectivist MOOC refers to connectivism as a theory of learning that emphasizes creation, creative activity, networked social learning. It is based on the principle of connectivism, openness, diversity, and interaction. Rather than delivering by an individual instructor, as we see in traditional university courses, cMOOCs hold groups of people learning together; commonly hosted by Social Networking sites(like Facebook. Twitter,) student-created blogs and wikis.

The students and teachers shared created knowledge shared between participants via student-student interaction, the student contents, interaction, and student-instructor interaction. The role of the teacher here can be defined as a co-learner whose duty is to create the content and achieve the goal by collaborating with another learner. cMOOC instructional design approaches attempt to connect learners to answer questions or collaborate on joint projects. One of the main principles of Siemens (2005) learning approach emphasizes the learners' flexibility in navigating web sites with meaningful interaction and engagement. PLENK2010 (Personal Learning Environments Networks, and Knowledge), Mobi MOOC 2010 (Mobile Learning),

and Edu MOOC (ONLINE learning today and tomorrow courses) are the primary examples of cMOOCs.

On the other hand in **xMOOC**, X stands for Extended Massive Open Online Course. This type of MOOC is mainly based on traditional university course structure, where we have specified syllabus of recorded lectures and self-test problems. MOOCs provide a platform where the contents are served online by the instructor of top-ranked universities following a particular course design model similar to the most in-class higher education system. Unlink cMOOCs, xMOOCs is based on linear and content-based learning, includes Peer-review easy type assignments, quizzes, lecture videos, text-based learning, presentation slides, audio files, hyperlinks of other related resources and so on. The educator is an expert provider of knowledge, and student communication is generally limited to asking for assistance and advising each other on problematic or delicate areas of study.

Generally, cMOOCs and xMOOCs are the most dominant methodologies in the online learning ecosystem.

1.2 Statement of the Problem

Nowadays, the cost of having proper education is very high, and the quality education is also not verified; it is becoming challenging for the middle class and poor people to cope up with the expense of education. Moreover, many people are away to reach school/college/university daily not possible for them; for working professionals also it is not possible to gain any course or degree is not possible while they are working. People mostly look for gaining knowledge in an efficient and less time-consuming way. Therefore, online learning is a possible solution for the present situation. In this scenario, MOOCs are the best solution, and people can reach MOOCs anytime, anywhere with the help of the Internet. It is straightforward to enrol in MOOCs; the enormous number of participants can enrol and access MOOCs at a time. The government of India has launched a brand new MOOCs platform named as SWAYAM having many

courses for the school, colleges, and university students. In this scenario, it now becomes necessary to spread the awareness of MOOCs.

1.3 The objective of the study

- ❖ To study the concept of Massive Open Online Course;
- ❖ To spread the awareness on Massive Open Online Course;
- ❖ To know the present scenario of Massive Open Online Course in India;
- ❖ To describe the selected Massive Open Online Course (MOOC) platform briefly.

1.4 Significance of the study

Recently the use of the Internet and Information Communication Technology (ICT) has brought immense change to the mechanism of teaching and learning. The purpose of MOOCs is to provide learning to a large number of students anytime, anywhere without a geographical boundary. This research provides an overview of MOOCs to the learners and developers MOOCs developers.

1.5 Review of Literature

In order to know the latest development in the areas of research on Massive Open Online Course literature available in primary as well as the secondary sources of information has been consulted. The researcher consults some journal articles and theses. There are different studies conducted on Massive Open Online Studies which has made us a clear picture of MOOCs and their progress over the world.

1.5.1. Previous international studies conducted on MOOCs

Many studies have been conducted on MOOCs at the international level. In this context, *Gerber (2014),* **Lane (2016)** talks about the adoption, implementation, and innovation of MOOCs in higher institutions. They discussed the impact of MOOCs in higher education

and its potentiality that change the scenario of education; Findings showed the MOOCs offers the best teaching classroom and interactive learning opportunities **Asiri (2014)**, **Ahmed (et al..…)**, (**Zheng et al..…**) studied the finding of students and teachers attitudes and perceptions towards learning and while using MOOCs in different Universities. This study reflects that MOOCs are being great in inspiring a significant number of learners; **Asiri (2014)** he tries to find out the reason why students are enrolling themselves in MOOCs, in which courses and how many courses they are enrolling, from where they heard about MOOCs, how many times they dropped out of MOOCs suggested that MOOCs providers should restrict students from taking no more than three MOOCs at one time. *McClure (2014),* provides information on the MOOCs movement and talks about various MOOCs platforms; diverse expertise that is necessary to be considered before offering MOOCs, expertise that helps in providing better education through MOOCs and discussed the challenges in accelerating MOOCs. Whereas **Hill (2015)** discussed the history of Distance Education, theories of learning and Massive Open Online Course design; he has selected four different courses, to study the experiences of students through the lens of social constructivist learning theory.

1.5.2 Previous studies conducted in India

Kumar and Mishra (2015), *Chakravarty and Kaur (2016)*, *Malik (2015) Nisha and V. Senthil (2015)*, *Gul [et al..…] (2015)* provide information about the origin of MOOCs; challenges and issues which MOOCs can create, MOOCs working mechanism and development in India along with some of the well-known platforms available today; key features and developments in MOOCs sector. *Rao, Komaraiah, and Reddy (2016)* put forth the challenges of MOOCs, merits, and demerits of MOOC compare to the traditional learning system. *Das and Das (2015), Nath, Karmakar, and Karmakar (2014), Devgun (2013)* discussed the potentialities of MOOCs in higher education.

They explored the impact of MOOCs in the context of higher educational institutions. ***Sharma and Jhamb (2017)***, ***Shelley and Srivastava (2016), Sawant (2016), Ambadkar (2015)***, ***R. K. Dixit et al….(2013)*** their study focused on investigates the possibilities of using MOOC for continuing professional development in India. The paper presents exciting insights into the working professionals supporting MOOCs as a satisfactory option for self-education. ***R. K. Dixit et al….(2013)*** study focused on developing a MOOCs using Moodle to train the teachers of Polytechnic and also to improve quality technical education in India. The National Institutes of Technical Teachers' Training and Research (NITTTRs) has taken the lead role in improving the status of technical education training in India. ***Nagasampige*** and ***Nagasampige (2015), Nautiyal*** and ***Sinha (2015)*** investigate the usage and awareness of different MOOCs in India and also the factor that motivates the student to study of MOOCs and opinion regarding implementation of MOOCs.

2.0 Tips for Designing a MOOC

Following given are some simple tips for designing a MOOC:

- ❖ Participating in a Massive Open Online Course (MOOC) is the best way to learn about a MOOC. It will give an experience of what it likes to be a student of a MOOC;

- ❖ One can read about the experiences of those who had already developed a MOOC, and this will let him/her know about effort, time, money, and rewards of developing a MOOC or teaching a MOOC. Some example like: clearing up myths about a MOOCs, teaching tips from a MOOC maker, written documents of faculties on MOOC model for digital practice;

- ❖ Choose a topic carefully, mostly on which developer has depth knowledge and interest;

- ❖ Design the course content very patiently to meet the need of the targeted audience;

- ❖ Team effort is required to make a MOOC successful. A single person cannot make a MOOC;

- ❖ It is essential to do proper planning, and there should be a timeline for designing various tasks of MOOC like creating lecture, videos, quizzes, writing objectives, designing assignments and this quadrant must be tested before it gets access to numerous students;

- ❖ Know first what the students will learn in the offered course and then try to design learning activities to support outcomes and make assessments that will measure whether students achieved their desired outcomes or not;

- ❖ It is not possible to interact with every student, in this case, encouraging discussion and communication among students can help the developer not to be a central figure in the offered course. For the example discussion forum, connecting via email, social media.; and

- ❖ Lastly, the assessment is the most required element in designing a MOOC. In the process of evaluation of student's performance, the automated grading system like a multiple-choice exam or programmed response activities, or "grading" on effort and contribution has been employed for assessment. On successful completion, of course, the conferring institution is awarding a certificate to the enrolled students after the successful completion of the assessment.

3.0 Features of MOOCs

- ❖ Many salient features are available for MOOCs which are given below:

- ❖ A MOOC can have an enormous number of participants. MOOCs are not limited to any geographical boundary;

- ❖ Anyone who wants to learn can join MOOCs without any restriction of formal qualification. Though MOOCs have a prerequisite for a particular course they do not stop any learner from joining;

- ❖ MOOCs are highly interactive. In MOOCs students not only interact with the instructor but also with fellow cohorts;

- ❖ MOOCs mainly follows four quadrants approach which provides instructional material includes lecture video, animations or interactive simulations, supplementary resources like case studies, wiki development of the course, open content available on the Internet and problems, quizzes and assignments; and

- ❖ Information and Communication Technology is used to its fullest capabilities to enrich coursework and delivery.

4. 0 Application of MOOCs in India

Digital technologies, particularly the extensive use of MOOCs in worldwide motivated India to include MOOCs in higher education, thought India has experimented with online classes before, but their impact has been marginal. A decade ago, India began with using internet connectivity to distribute video and Web-based courses under a Government-funded program, the National Program on Technology Enhanced Learning. Developers created more than 900 courses which are mainly focussing on science and engineering, with about 40 hours of instruction each, but unfortunately, these courses failed to attract the vast body of students. MOOCs have given Indian academics a better sense of how a lecture could be restructured into short, self-contained segments with high interactivity to engage students more effectively. From the available data, it is believed that India's spending on higher education is one of the highest in the world, and India's higher education system is the third-largest in the world. University enrollment in India is enormous and growing, it is not possible to reach

and impart education to all through universities, and in this case, MOOCs can be the best option to impart education in every corner of the country.

5.0 Massive open online courses (MOOCs) platforms around the world

Below mentioned are the most important platforms of MOOC in worldwide:

5.1 Udacity

Udacity is a for-profit educational organization, founded by Sebastian Thrun, David Stevens, and Mike Sokolsky in June 2011, offering Massive Open Online Courses (MOOCs) worldwide. Courses in Udacity consist of various units comprising quizzes, video lectures, and homework to help students in understanding the concepts and boost ideas. It uses Python language in Programming classes, and programming assignments are graded by automated grading programs installed on the Udacity servers. The motto of Udacity is to provide accessible, affordable, engaging, and highly effective higher education to the world. Udacity helps their student to advance their carrier and education.

5.2 Coursera

Coursera is one of the largest MOOCs providers, and the top educators are engaged to for imparting courses who belongs to Worlds best universities and educational institutions. Stanford's Professors Andrew Ng and Daphne Koller founded Coursera in 2012. On Coursera, students have access to mobile learning, sharable course material, and specialization certificates, academic and technical support from the Mentors of Coursera, and knowledgeable learner support team, it also includes video subtitles in over thirty languages. Coursera has courses of 4 to 10-week duration. Coursera offers specializations and degrees in a variety of subjects, such as engineering, humanities, medicine, biology, social sciences,

mathematics, business, computer science, digital marketing, data science, and others. Courses include video lectures, auto-graded and peer-reviewed assignments, and community discussion forums to help students understand concepts and boost ideas. Courses provided on-demand, in which users can take their time in completing the course with all of the material available at once. Coursera offer certificate after the completion of course**.**

5.3 *Edx*

edX is a consortium of universities which comes together on not for profit purpose to offer Massive Open Online Courses. edX is created in May 2012 by the Massachusetts Institute of Technology and Harvard University. The first edX course was circuits and electronics taught by Gerry Sussman, Anant Agarwal, Chris Terman, and PiotrMitros from MIT. Through Edx consortium, they present the best of higher education online, offering the opportunity to anyone who wants to achieve, thrive, and grow.

5.4 *Alison*

Alison is the first MOOC provider of the world, founded in 2007, in Galway, Ireland created by Mike Feerick. As a for-profit, Alison's objective is to enable anytime anywhere access to gain education and skills for career development. It has provided hundreds of best courses, namely, development, including business & enterprise, languages, personal development, and IT. Its course material is such that it will help the participant to develop their creativity, confidence in professional skills, and to be as contented and productive in the world of work.

5.5 *Udemy*

Eren Bali, Oktay Caglar and Gagan Biyani established Udemy in 2010 to provide a platform for online learning. Udemy is different from another kind of MOOCs; it does not provide academic courses, unlike traditional collegiate course, Udemy uses online content to sell for

profit. Udemy mainly aimed at professional adults, it serves as a platform that allows instructors to build online courses on topics of their choosing, it offers a tool which enables the user to create a course, promote it and earn money from student tuition charges. In Udemys course development tools, they can upload videos, PowerPoint presentations, PDFs, audio, zip files, and live classes to create courses. Instructors can also engage and interact with users via online discussion boards. Udemy offers paid and free courses, depending on the instructor.

5.6   *Futurelearn*

The Futurelearn provide most popular MOOCs which is owned by the Open University in Milton Keynes, England. FutureLearn's courses span a broad range of topics. FutureLearn is available in different languages, namely English, French, Dutch, Spanish, Chinese.

6.0   *Some important MOOCs Platforms in India*

6.1   *Edukart*

Edukart is India "s one of the leading MOOCs providers, it is started jointly by Stanford University, Indian Institute of Management (IIM), and the University of Delhi in 2011. Edukart "s motto is to provide high quality and industry-relevant online distance learning degree, international programs, and certificates. Edukart is helping students and working professionals to learn about relevant industry required skills and techniques to become a knowledge workforce. The purpose of Edukart course is to provide high-quality industrial information and knowledge at a low price. EduKart.com creates a difference in the lives of those who aspire to move ahead.

6.2   *Apnacourse*

Apnacourse is one of the critical MOOCs providers company in India which is founded by Satish Rajagopalan. The company is created for profit-making by Spearhead online Pvt. Ltd. and established in August

2013. Presently it has thousands of participants craving skill development to upgrade their career and knowledge. ApnaCourse is offering courses on sales and marketing, banking and finance, IT and security, project and operations management, HR management, personal development, statistics, and data analytics. Ts to enhance the learning experience. ApnaCourse has been awarded as the best E-learning company at Global Learn Tech Congress in comparison to other companies and Awards 2014 startup of the year 2014 in Online Education by Silicon India and also awarded emerging SME of the year 2015 by KSMBOA.

6.3 National Programme On Technology Enhanced Learning (NPTEL)

NPTEL is a government initiative projected in 1999 to introduce multimedia and web technology in online learning to the basic concept of science and engineering. It is a joint initiative by seven technological institutions of India such as Indian Institute of Technology Delhi, Bombay, Madras, Kanpur, Guwahati, Kharagpur and Roorkee.

NPTEL is established by the Indian Institute of Science on September 3 2006, to offer course contents on Science and Engineering, Project NPTEL has its root at IIT Madras intended to provide classroom lectures through videos to all students. As per YouTube statistics, NPTEL has emerged as one of the most viewed educational channels amongst the top 100 channels. NPTEL aims to provide high-quality education and standard both the faculties and students.

6.4 Swayam

Swayam is launched in July 2017 by Govt. of India to provide Massive Open Online Courses (MOOCs) with a provision of certificate or credit-transfer. It is the program of MHRD spells out as Study web of Active Learning for Young Aspiring Minds (SWAYAM). They offer

courses ranging into hundreds of courses, at school, college and University Level.

Swayam is developed by MHRD & AICTE with the help of Microsoft. Swayam offers free and interactive courses from class 9th to Post Graduate level. Swayam follows the cardinal principles of education policy as Access, Equity, and Quality.

Swayam offers on 4 Quadrants such as video lectures, reading material, self-assessment tests, and discussion forums. Seven national coordinators of Swayamis NPTEL for English, UGC for Post Graduate, CEC for Under Graduate, NCERT & NIOS for School Education, IGNOU for out of the school students, and IIMB for Management study.

6.41 IIT Bombay

The Swayam courses are the platform developed by IIT Bombay to offer Massive Open Online Courses to individuals from different backgrounds. They are providing hybrid MOOCs, which gives the luxury of flipped classrooms, online lectures as well as live interaction with the IITBombayX course instructors. IIT Bombay offers four different types of MOOCs for various learning needs, namely: EduMOOCs, SkilMOOCs, TechMOOCs and LifeMOOCs. The Content Management Software Drupal has been employed for developing Swayam courses.

6.42 MooKIT

MooKIT is a lightweight MOOC management system built entirely using open-source technologies by Indian Institute of Kanpur (IITK), in 2014. It is a robust system to offer online courses at any scale, from micro to massive. It is designed to offer cMOOC (connectivist MOOC). It has been used in 60 courses with about 200,000 registered learners from 90 different countries.

7.0 Software for developing massive open online course (MOOC)

For offering open Online Course (MOOC) to the users, MOOC developer should choose the appropriate platform which will enhance the learning facility in online mode. It is better to choose a free platform instead of a paid one.

7.1 *Moodle*

The first version of Moodle was released on August 20 2002. Out of all Open Source Learning Management System (LMSs), Moodle is the most popular one. Moodle stands for Modular Object-Oriented Dynamic Learning Environment. Moodle is developed on pedagogical principles by Martin Dougiamas, an educator and computer scientist from Perth, Australia. Moodle's first version released on August 20, 2002 and the latest version of Moodle 3.6.1 released on December 5, 2018. Moodle is open-source software (OSS), distributed under General Public License GNU and written in PHP. We can easily use the demo version of Moodle available in moodle.org to know how to operate Moodle and explore many features. Installation of moodle is straightforward. It is available freely on moodle website *www.moodle.org* as well as the demo for how to create a MOOC course in a moodle is also available on this website. Moodle supports*Multi-language, collaborative messaging, multiuser support, upload various documents, easy to use interface, Moodle mobile; Plugins are a flexible toolset, various Graphical themes for Moodle.*

7.2 *Sakai*

Sakai is also much-renowned software for designing a MOOC. It is developed by A community of academic institutions, commercial organizations, and individuals have developed this course through the Mellon Foundation originally founds it as the *Sakai Project.* Sakai is a few different from Moodle; Java Language is used to develop Sakai. The first version of Sakai was released in March 2005 and the latest

version 12.3 released on March 22 2018; it is distributed under the Educational Community License (an open-source license). Sakai is very reliable and extensive; its largest installations handle over 100,000 users.

7.3   *Atutor*

It is developed by Inclusive Design Research Centre, OCAD University. ATutor was first released in 2002; written in PHP and delivered under GNU General Public License. The latest version of ATutor 2.2.4 release on June 20 2018. The software is unique because of its features and right educational content arrangement. The software includes themes, eLearning Assessment tools, Social Networking, Work Group poll integration, Various test manager, links database, and many more; it is user-friendly and easily accessible; it has various modules to enhance functionality.

8.0   Suggestions and Recommendations

- MHRD govt. of India in collaboration with INFLIBNET or IITs, they should organize a regular workshop on MOOCs, although they are conducting workshops on MOOCs, they should organize more number of workshops in North Easter Region universities also;

- MOOCs is a new phenomenon so the students should get proper guidance regarding the enrolment of any MOOCs; and

- The library must help the MOOC developer in providing awareness on MOOCs among students or organizing any MOOCs orientation program inside or outside the library;

- Universities around North East can come together with their best courses and teachers to provide quality education in a single platform through MOOCs.

9. Conclusion

This study reveals that in developing countries, Massive Open Online Courses have been developed in large numbers in comparison to in developing countries in which a large number of users have enrolled in different courses. It is found from this study that massive Open Online Course (MOOC) has spread widely and presenting more profound impact in every discipline including library and information science as well as provides significant space for the development of their professionalism in the academic community. Many software has been developing since the emergence of MOOCs to supports its potentiality in delivering the best teaching and learning experience; for example, Moodle is a well-known software for developing Massive Open Online Course. On the other hand, MOOCs provides massive opportunities to the kind of professionals for spreading their knowledge worldwide and also for all kind of users who wants to learn their interested topics at their place and leisure time irrespective to the traditional education system. MOOCs will be very much helpful in the professional development of LIS professionals and provides excellent opportunities and platforms to learn MOOCs technology and assist MOOCs developers. The association for Library collection and technical services (ALCTS) offers a series of webinars to address the role of the librarian in online learning.

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An Insight into Open Access Tools for Researchers

*Jishnu Mondal**
*Dr. Sukumar Mandal***
*Dr. Tridib Tripathi****

Abstract:

Science has evolved a lot form the Stone Age. We are now living in a sci-fi world where almost everything is a gift of science. A lot of research is being performed every day to innovate new tools in order to make life easier .With the advancement in ICT numerous open-access tools have made their way into the scholarly world to facilitate literature search, research writing, reference management, collaboration, data sharing, and research promotion. An attempt has been made to highlight some of the open-access tools that researchers can use at various stages of the research workflow. The study also demonstrates notable initiatives by Govt. of India.

Keywords: ICT, Open access, Sci-Hub , Purdue Owl , Mendeley , Plagiarism Checker, Academia , Sodhganga

1. Introduction

The face of research is changing globally. Due to the intense competition in academia, there is immense pressure on researchers to

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* Professional Assistant, Central Library, Visva-Bharati, Santiniketan
Email: jishnu.mandal@gmail.com;
** Assistant Professor
Department of Library and Information Science, The University of Burdwan
*** Professor (Retd.), Department of Library and Information Science
The University of Burdwan

publish their research work at a fast pace. The role of researchers is no longer restricted to conducting, writing, and publishing research; they are expected to collaborate across the geographical boundaries, contribute to the research community as peer reviewers and journal editors, attend conferences to network with their peers, promote their ideas to the scientific and non-scientific community, and stay on top of new developments and innovations in their respective fields. Hence, researchers have a lot to deal with. To help researchers juggle the multiple roles they have to play, the information and communication technology (ICT) has been coming up with a diverse range of innovations to facilitate literature search, research writing, reference management, journal selection, collaboration, networking, data sharing, and research promotion. Besides, some tools also aim to make research efficient by working towards standardization. Digital tools can make every research work easier, from observation to publication. Presently, there are numerous tools are available for different activities in the research workflow. If effectively deployed, these tools could offer a way to enhance research experiences.

2. Statement of the problem

The face of teaching, learning, and research is changing globally. With the advancement in ICT, numerous digital tools have recently made their way into the scholarly world to facilitate literature search, research writing, reference management, journal selection, collaboration, networking, data sharing, and research promotion. In spite of several advantages, these tools are being underused due to a lack of awareness among the researchers. The main focus of the present study is to shed light on those open access research tools that can help researchers in improving their research output. Hence, the problem of the present investigation "***An insight into Open Access Tools for Researchers***" is a topic of paramount significance in order to keep pace with the time and emerging IT revolution.

3. Objective of the study

The research process involves putting a sufficient amount of time and effort to find the right information and data, which is then collected, organized, and processed. In the early days, researchers had to spend countless hours, or even days in libraries and information centres in order to find the required information. Today, however, information can be found online, which makes the entire research process much easier and faster (Bartee, 2019) .To make the researchers' life easier and hassle free a lot of research is being performed every day to innovate new tools. These tools aims to change the way researchers carrying out their research for good, and for the better, and made the research output much more streamlined and effective. In the end, that's the thing that matters the most (Tooley, 2015). Currently, there are over 400 tools available for different activities in the research workflow among which there are many tools are available in open access platform. However, empirical studies have shown that despite of several advantages these tools are being underused due to lack of awareness among the researchers. As a result, the information-rich are becoming richer with knowledge acquisition while the poor are becoming poorer. The time has come to try out these open access research tools in creating learning opportunities for everyone, and to end the digital divide. Hence, the objective of the present study is to "*shed light on those open access research tools that can help researchers in improving their research output*".

4. Open Access tools for Research

The face of teaching, learning, and research is changing globally. Irrespective of subject discipline, research is considered as a time-consuming task. And a lot of research is being performed every day to innovate new tools to carry out research work smoothly. For the scientific progress of any study, it is essential to divide the entire research process into several crucial activities such as formulating hypothesis, observation, analysis, publication, and dissemination.

With the advancement in ICT, numerous digital tools have recently made their way into the scholarly world in order to make these activities much easier. If someone is conducting research, it is important that he/she has appropriate methods and tools to carry out his/her research. If he/she is a non-native English speaker, then he/she may need a tool to help him with his/her written language. If their research involves data analysis, then they need a good statistical tool for data interpretation. It is also important that they should keep track of what other people in their research arena are doing, so they need tools like Academia.edu and ResearchGate to collaborate with their peers. Finally, they also need a good plagiarism checking software to avoid any academic misconduct. To help researchers juggle the multiple roles they have to play, the present paper attempts to highlight some of the popular open-access tools that are designed to help researchers explore, use and manage the millions of information resources available to this date. Although, the following list of open-access tools is not intended to be exhaustive but drafted to provide a reasonable and informed introduction to manifold advantages available from tools.

Literature search and Academic search engines:

Academic search engines have become an indispensable tool in order to find research articles and other scholarly resources. While commercial databases like Proquest, Scopus, Web of Science, etc. are locked behind paywalls, academic search engines can be accessed free of charge. To help researchers, the study compiled the list of the following academic search engines and websites which are as follows:

- **Google Scholar** (https://scholar.google.com/): Google Scholar is considered a pioneer when it comes to academic search engines. Google Scholar index includes e-books, peer-reviewed journals, conference proceedings, abstracts, theses and dissertations, technical reports, and other scholarly literature across a wide array

of subject disciplines. (https://en.wikipedia.org/wiki/Google_Scholar)

- **Microsoft Academic** (http://academic.research.microsoft .com/): is also an open access academic search engine developed by Microsoft Research for academic publications and literature.

- **BASE** (Bielefeld Academic Search Engine-https://www.base-search.net/): It is one of the most voluminous search engines especially for academic web resources in the world which provides more than 150 million documents from more than 7,000 sources (https://www.base-search.net/, 2020).

- **CORE** (https://core.ac.uk/): CORE aims to aggregate all open access research outputs from worldwide and facilitates free unrestricted access to research for all.

There is a host of other noteworthy websites available to help researchers explore the millions of articles that have been published to date and help them stay on top of the literature in their field. Here are a few examples:

- **BioMedCentral** (https://www.biomedcentral.com/): BioMedCentral **(BMC)** is a pioneer in open access publishing that has an evolving collection of high-quality peer-reviewed journals (https://www.biomedcentral.com/).

- **DOAB** (https://www.doabooks.org/): The primary objective of DOAB (Directory of Open Access Books) is to increase the accessibility of open access books. The collection covers all disciplines however main focuses are on humanities, law, and social sciences. All books in DOAB have a full open in access license, making them 'free to share'.

- **DOAJ** (https://doaj.org/): The DOAJ (Directory of Open Access Journals) was launched in 2003 at Lund University, Sweden that indexes and provides free access to high-quality peer-reviewed journals (https://doaj.org/).

- **Springer Open** (https://www.springeropen.com/): SpringerOpen is Springer's portfolio of fully open access journals and books, covering all areas of science. The entire content published with SpringerOpen is freely accessible online immediately upon publication (https://www.springeropen.com/about/what-is-springeropen).
- **World Digital Library** (https://www.wdl.org/en/)**:** The World Digital Library (WDL) is an international digital library operated by UNESCO and the Library of Congress with a mission to expand the volume and variety of cultural content on the Internet, promote international and intercultural understanding, provide resources for educators, scholars, and general audiences, and to build capacity in partner institutions to narrow the digital divide within and among countries. (https://en.wikipedia.org/wiki/-World_Digital_Library)
- **Project Gutenberg** (https://www.gutenberg.org/): Project Gutenberg, aptly named after the inventor of the movable type printer, provides web access to over 20,000 books. It is the largest collection of free books on the internet.
- **Internet Archive** (https://archive.org/): **Internet Archive** is a US-based digital library that provides unrestricted access to collections of digitized materials, including websites, software applications/games, music, movies/videos, moving images, and millions of books mission of "universal access to all knowledge" (Lewis,2020).
- **ArXiv** (https://arxiv.org/): is an open-access repository of electronic preprints in the fields of physics, mathematics, statistics, astronomy, computer science, electrical engineering, economics, etc. which can be accessed online.

Bypassing paywall websites

Subscription fees and paywalls are the two major obstacles of students, researchers and academics for reaching the research articles.

Here bypassing paywall websites come into play. Following are some of the websites that researchers can go with. However, bypassing paywalls and downloading these documents is technically illegal in many countries still these sites are extensively used worldwide.

- **Sci-Hub** (https://sci-hub.tw/): Sci-Hub is a website founded by Alexandra Elbakyan in 2011 in Kazakhstan that offers free access to millions of high-quality research papers and books without regard to copyright, by bypassing publishers' paywalls. Despite being successfully sued twice by major academic publishers for copyright infringement, the site continues to operate extensively worldwide. Other websites in this category are as follows:

- **Library Genesis:** http://gen.lib.rus.ec/

- **Booksc.org:** https://booksc.org/

- **Open Access Button:** https://openaccessbutton.org/

Electronic lab notebooks

An electronic lab notebook (also known as electronic laboratory notebook or ELN) is a computer program designed to replace paper laboratory notebooks. Electronic lab notebooks are a fairly new technology and offer many benefits to the user as well as organizations. Here are a few examples:

- **ElabFTW** (https://www.elabftw.net/)**:**

- **Lab Archives** (http://www.labarchives.com/) **–** is an innovative cloud-based tool that enables researchers to store, organize, and publish their research project.

Online Survey Tool

Online (Internet) surveys are becoming an essential research tool for a variety of research fields, including marketing, social and official statistics research (https://en.wikipedia.org/wiki/Survey_data_coll-

ection, 2018). Following are the popular online survey websites researcher can use:

- **Survey Monkey:** (https://www.surveymonkey.com)

- **Google Forms:** (https://www.google.com/forms)

- **Survey Gizmo:** (https://www.surveygizmo.com/)

Research project writing

- **Overleaf** (https://www.overleaf.com/):Researchers those who are familiar with LaTeX, Overleaf is a tool that helps them to create, edit and share their scientific ideas online using LaTeX.

- **Purdue Owl** (https://owl.purdue.edu/owl/purdue_owl.html)**: Purdue University's Online Writing Lab (OWL)** houses essential writing resources and instructional material which are provided as a free service. Researchers, students and academics around the world will find useful information on writing research projects. This is probably the only resource, a researcher will ever need as far as writing is concerned. Researchers can find everything regarding grammar, citations, etc.

Grammar and Spell checker

Poorly written content with grammatical and spelling errors will kill the trust of readers. This is why more and more researchers are using grammar checker tools while writing a research project. Popular websites in this category are as follows:

- Grammarly: https://app.grammarly.com/

- Gingersoftware grammar checker : https://www.gingersoftware.com/grammarcheck

- Language tool: https://languagetool.org/

Reference Management

Reference management tools or reference managers are software that researchers use to handle references and citations while writing. Reference managers store full-text papers along with the references and also allow users to take notes on and annotate PDFs. Most importantly, they help in formatting in-text citations and bibliographic references while composing a manuscript. Popular website in this category are as follows:

- **Mendeley** (https://www.mendeley.com) is free reference management software that helps researchers in organizing their bibliographic data, generation of in-text citations, footnotes, and bibliographies. (https://www.elsevier.com/en-in/solutions/mendeley).

- **Zotero** (https://www.zotero.org/) is an open-source reference management software that manages bibliographic data and other research materials. Key features of Zotero include generation of footnotes, in-text citations, and bibliographies (https://en.wikipedia.org/wiki/Zotero).

DataVisualizing tool

Representing results through charts, images and graphs are crucial when working on a research article, or for a conference presentation. Making use of digital tools for data visualization can make research work easier to understand. Some of the popular data visualizing tools are as follows:

- **draw.io** (https://app.diagrams.net/): draw.io is a completely free online diagram editor built around Google Drive(TM), that enables researchers to create flowcharts, UML, entity relation, network diagrams, mockups, etc.

Cloud Storage

The "cloud" is a collection of data centers that could be located anywhere. Those data centers can host far more data than any person could even fathom storing locally. The following are the cloud storage options that let one to store valuable data for free:

- **Google Drive** (https://www.google.com/drive/): Google Drive is a file storage and synchronization service developed by Google. Launched on April 24, 2012, Google Drive allows users to store files on their servers, synchronize files across devices, and share files. Google Drive offers a whopping 15 GB of free cloud storage.

- **MediaFire** (https://www.mediafire.com/): lets you store up to 10 GB of any kind of file for free, allow you to access the files from anywhere and share them via email, link, or social media.

Online Statistical Testing Tools

One of the most important requirements while writing up research project is the use of appropriate statistical methods for data interpretation. Whether it is quantitative or qualitative research, statistical analysis is an indispensable part of any research workflow. There are plenty of research tools available in open access platform that allows researchers to do a wide variety of statistical analysis for their research. Popular website in this category is as follows:

- **Daniel Soper** (https://www.danielsoper.com/statcalc/default .aspx)**:** Provides a collection of 106 free online statistics calculators organized into 29 different categories.

- **SocSciStatistics** (https://www.socscistatistics.com)**:** This web site offers free resources for students and researchers working with statistics in the social sciences.

Plagiarism Checker

Plagiarism is seen as academic misconduct .Plagiarism is a highly intolerable act in the literary and digital community that all researchers are trying to avoid. In order to get rid of duplicate content, researchers must run it through Plagiarism Checker, which will scan the document and determine if there is any duplicate content present in their research work. If there is any similarity, researchers either need to provide better citations or rewrite their work so that it could be more unique. Some of the popular open access plagiarism checking websites is listed below:

- Dupli Checker :   https://www.duplichecker.com/
- PlagiarismDetector: https://plagiarismdetector.net/

Find and share data and code

Managing large sets of data and programming code is already unavoidable for most researchers. Tools have been developed to efficiently store and share data and code. These tools have become increasingly important as data and code sharing become the norm and a requirement of most funding agencies. Popular website in this category are as follows:

a. **Code Ocean** (https://codeocean.com/) – It is a cloud-based computational tool that provides a way to discover share, and run published code.

b. **SlideShare** (https://www.slideshare.net/) – is a networking platform for sharing presentations and other professional content. Researchers can use it to share the presentation of their research publicly.

Social media for researchers

Research cannot stay buried in the laboratory anymore. There are numerous tools that will help them reach out to other researchers and

find expertise for new collaborations. Using social media platforms such as ResearchGate, LinkedIn, Facebook can be an excellent way to promote research and share it with a wider audience. Social media channels also help researchers to access up-to-date information in their field, stay in contact with peers and colleagues, and exchange ideas on different subjects. Below mentioned social media websites can help researchers decide which one is the best for them:

- **Academia** (https://www.academia.edu/)**:** Academia.edu is a social networking site for academics. It began as a free and open repository of academic journal articles, however, Academia.edu now restricts all access to subscribers and charges fees to put authors in contact with their readers.

- **Linkedin** (https://www.linkedin.com): It is a professional networking platform. Researchers can use it to share updates on their research publicly or in a specific group.

- **ResearchGate (**https://www.researchgate.net/)**:**ResearchGate is the professional network for scientists and researchers. Over 17 million members from all over the world use it to share, discover, and discuss research.

- **MyScienceWork** (https://www.mysciencework.com): Founded in 2010 by Virginie Simon, MyScienceWork serves the scientific community and promotes easy access to scientific publications. Its database includes more than 90 million scientific publications and 12 million patents.

Research Promotion and publication:

- **Scientific Journal Finder (**https://journalfinder.elsevier.com/): This tool helps researchers find scientific journals that are closely aligned to their research project. They are then able to browse through these journals for promising articles.

- **eLife** (https://elifesciences.org): is a non-profit organization created by funders and led by researchers. Its mission is to accelerate discovery by operating a platform for research communication that encourages and recognizes the most responsible behaviors.

5. Web-based tools for Research: Govt. of India initiatives

Online learning tool has become a global phenomenon. Rapid globalization and the enormous growth of knowledge are the main factors that have forced a vast number of students to go for it. The higher education sector in India is currently undergoing a rapid transformation process. Electronic content and smart classrooms are becoming lifeline of education. Govt. of India has made a huge investment in higher education to digitize educational content and delivery using state-of-the-art information and communication technology. Presently the endeavour of the Govt of India in this direction has been mainly towards providing the infrastructure and network to the institutions of higher education. The use of digital technologies in all aspects of higher education has received a major push in India and many of these efforts are presented below:

- **National Digital Library of India** (https://ndl.iitkgp.ac.in/): Ministry of Human Resource Development (MHRD), Govt. of India has initiated the National Digital Library of India (NDLI) project to develop a framework of virtual repository of learning resources with a single-window search facility.

- **Sodhganga** (https://shodhganga.inflibnet.ac.in/#)**:** Shodhganga provides a platform for researchers to deposit their Ph.D. theses and make it available to the entire scholarly community in open access. The repository can capture, index, store, preserve, and disseminate ETDs submitted by the researchers.

- **Sodhgangotri** (https://shodhgangotri.inflibnet.ac.in/)**:** Shodh Gangotri provides a platform for researchers to deposit an

electronic version of their approved synopsis to the universities for registering themselves for the Ph.D. programme and make it available to the entire scholarly community in open access. The prime objective of the repository is to reveal the trends and directions of research being conducted in Indian universities as well as avoid duplication of research.

- **INFOPORT** (https://infoport.inflibnet.ac.in/index.aspx)**:** INFLIBNET Centre promotes open access to Indian scholarly content through the InfoPort: A subject gateway for Indian e-resources. InfoPort selectively catalogues online resources of Indian origin on diversified subjects available in open access through an elaborate process of testing and evaluation (https://infoport.inflibnet.ac.in/about.aspx).

6. Web-based tools for Research: Challenges and opportunities

Open access research tools have opened up a vast opportunity for researchers to learn new skills and improve their academic performance. This is mostly due to the researchers being able to learn faster online. However, new technologies are particularly vulnerable to criticism as they can be costly to employ, time consuming to learn to use, and may initially demonstrate little pertinence for teaching, learning, and research. Other challenges include limited accessibility and network connection, lack of effective training, lack of researchers' competency, etc.. Open access research tools such as those mentioned in this article should, therefore, be systematically evaluated to ascertain their benefits and limitations in the research process. Looking into prospects of open access research tools it is clear that, these tools are here to stay and can be of great use in the research activity as the acceptance of these tools among the current generation of researchers is growing steadily.

Conclusion:

Armed with these online tools, researchers will be able to upgrade their skills, improve their academic performance, and ultimately, write better papers. If effectively deployed, these tools could offer a way to enhance research experiences, and deepen levels of researchers' engagement and collaboration within the online learning environment. However, there is evidence that technology is neutral until it delivers content and will lose its effectiveness if it is not applied in a planned and systematic manner .In this paper, researchers have explored how these open-access tools would prove useful on the long run for research workflow. Careful thinking and research are still needed in order to find the best ways to leverage these emerging tools to boost our teaching, learning ,and research productivity, foster better 'communities of practice', and support continuing research activity. The study, however small, will create an awareness and impetus among the researchers so that they can use these tools effectively and efficiently.

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Digital Research Management Tools : An Open Access Approach for Scientific Research Community

Vivek Kumbar[*]

Abstract:

The digital publishing of scientific articles has witnessed a numerous innovations across the lifecycle of creating, publishing and archiving of scientific publications. Digital research managemet tools plays vital role in the production of communication of scientific knowledge and new modes of publishing – which spans from new review, online citation indexes and social media tools will help to the boost research output of an individual. Commercial academic publishers so far have not only have successful defended but extended their market position This paper mainly focus on digital research management tools used to keep the research community to increase the research output in an effective manner.

Keywords: Open access tools, research management, digital research, open access software.

1. Introduction:

In the Internet era, library and information centres become virtual knowledge management centres to provide various relevant open source tools to fulfil needs of academic research community to keep update themselves, in such each individual research foot print in the

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[*] Project Scientific Assistant (Library)
The Institute of Mathematical Sciences, CIT Campus, Taramani, Chennai.
Email: vivekkumbar58@gmail.com

very much significant or citation of research articles will be helpful to another researcher for further investigation. Digital research management tools helps to manage bookmarking of research article, discovering literature and it is also helpful to the research community to explore millions of research articles available to this date.

Article visualisation tools will boost your reading experience , for instance, helping you to navigate from paper to another and search engines and curators assist researchers to discover articles of there interest and keep current approach to the information of research.

Open access resources are those it can be accessed regardless of time and geographical boundaries without having much more obstacles and it is available at free of cost and provides quick discovery of research literature.

2. About DRM Tools :

Virtual technologies are being used in every disciplines of information, there has been a real explosion of digital tools to collect, analysis, preserve, share and granular information without any hurdles in research process, e-research has considerably moved beyond the use of particular instrument to capture data. 'Growing Knowledge' the growth of research is an exhibition held in London from 12 October 2010 to 16 July 2011 organised by British Library focus on innovative projects chosen from wide range of disciplines use new technologies in research to reveal new types of knowledge.

Digital Scholarship has seen plenty of changes in last two decades as technological innovations has transformed almost every aspect of how academic do research, publish, cooperate and teach, this especially true when focusing on side of research (weller, 2011;Economist, 2008). The contribution and share of scientists in open virtual mode publishing process has increased significantly.

3. Objective of the paper :

1. To Provide holistic overview of research project
2. Create a logical framework offering structure to research
3. Reveal multiple perspectives to initiate new connections
4. Increase the speed of writing your research paper.
5. Explore the methods of searching effectively to retrieve required information quickly.
6. Enhance the quality of research output

4. Approach for digital research management tools :

1. Planning and describing data related to the particular task before it get published
2. Archiving your data so, others can trace and understand it.
3. Preserving the data safely during the project
4. Depositing it in trusted and authenticated repository or archive at the end of the project.
5. Linking publications to the datasets that underpin them

Open Access Scientific Databases :

i. **Biohunter** : It assist you to find relevant articles for your innovative research and it is especially designed for biomedical sciences, here you can download full text articles from reputed journals at free of cost at your smart phone or desktop and it's also useful for data statistics on given population, it will suggest you journal based on your query.

ii. **Get CITED** : It is powerful search tool for discovering scientific literature based on your need, it is one stop platform that offers everything related to your academic publications such as chapters, conference papers, reports and presentations. The 2 most outstanding features of this academic search engine consists of 'a descriptive database' and 'discussion forum' and also it supports the patron to search by bibliographies in an article.

iii. **Bioline International** : It is most authenticated and trusted database of academic journals published in developing nations in Africa, Asia and South America on public health, food and nutritional security, medicine and biodiversity and founded in 1993 by Leslie Chan.

iv. **Directory of Open Access Journals (DOAJ)** : It is another open access directory of journals for scientific and scholarly resources with coverage of 8000 journals available on various scientific disciplines and it is maintained by Infrastructure services for open access and setup by Lund University in 2003 as discussion took in Nordic conference on scholarly communication in 2002. It has collection of open access peer-reviewed scientific journals available at free of cost.

v. **PLOS ONE** : It is open access scientific literature platform, launched in 2006 and the articles before publishing in this platform going through strict peer-reviewed process. This academic database has the lot of meticulous process for publishing a journal and it has rich collection of scientific articles. As per 2016 it has published 22,054 articles.

vi. **Science and technology of Advance Materials** : It is peer-reviewed academic journal, launched in 2008. It provides free access to academic journals in major areas of science and technology, this academic directory provides easy and simple access to plenty of information related to scientific literature.

vii. **New Journal of Physics** : It is scientific academic journal database with Physics as core subject and provides access various number of scientific research articles in full text at free of cost. This is founded in 1998, it is co-founded by Institute of Physics and Deutsch Physikaliache Gesellschaft.

viii. **Science Open** : It is a freely accessible search and scientific resource discovery platform that puts research in context and

founded in 2013 by Alexander Grossmann. Smart filters, topical collections and input from the academic community assist you to trace the most relevant articles in your field and beyond, it allows you to setup a personal profile based your ORCID and network to other scientists.

ix. **Unpaywall** : It is an open access database, which covers large scholarly articles from various publishers and it harvests open access content from 50,000 publishers and repositories , it's easy to discover and use to access large number of open access scholarly literature.

x. **Pubmed** : It is an open access database particularly related to biomedical scientific literature, launched in 1996 by national library of medicine, U.S at national institute of health and it provides access to MEDLILNE bibliography and abstracts on life sciences . In addition to this PubMed also provides references to print version of Index Medicus(1951) and it has own citation styles known as 'PMC Citations' and for uses the medical list of subject heading(MESH) for deriving the keyword to the it's publications.

xi. **Research Gate**: It is global professional network for scientists to portion, trace and discuss research, the ambition of it is to connect world of science and make research visible to all, founded in 2008 by Dr. Ijad Madisch and Dr. Soren Hofmayer. In this academic network you can share your research publications and access million of publication of others at free of cost and provides data about your articles has how many time by other researchers.

xii. **My Science Work**: It serves to international scientific community and promotes easy access to research publications and open science, founded in 2010 by Virginie Simon, a biotech engineer and Tristan Davaille, financial engineer. It is descriptive database consist of greater than 90 million research

publications and 12 million patents and will foster data sharing among science organisations

Scientific open access databases	url
Biohunnter	https://www.biohunter.in
Getcited	http://www.getcited.org
Bio-online	http://bioline.org
DOAJ	http://www.doaj.org
PLOS	http://www.plosone.org
Science and technology of Advance Materials	http://iopscience.iop.org/1367-2630
New Journal of Physics	https://iopscience.iop.org/1367-2630
ScienceOpen	https://www.scienceopen.com
Unpaywall	http://unpaywall.org
Pubmed	https://pubmed.ncbi.nim.nih.gov
ResearchGate	https://researchgate.net
MyScienceNework	https://www.mysciencework.com

4.1 Open access scientific databases

4.2 Open access data visualisation tools :

i. **Wizdom** : It is open source web and mobile based research management software, designed by University of Oxford and developed by colwiz. Ltd. It incorporates reference management, collaboration and networking tools, as well as productivity features like it allows patron to search, read and share research publications, archiving of publications can be done in customised folder of it's library. The Wizdom import wizard can automatically publications to it's library from other general reference libraries like Mendeley, Zotero and End Note

and also other file supporting file formats like(PDF, BibText and RIS). It support browsers like Mozilla Firefox, Google Chrome and Safari and at last it enhance quality of research providing visualisation tool like various graphs and charts of various research done particular subject by institutions, nations and individual.

ii. **eLife**: It is an initiative from research funders to transform research communication through progress science publishing, technology and research culture. It provides a novel of looking content on the web.

iii. **PaperHive** : It discussion forum of research papers embedded in regular workflow, here researchers can attach the questions, corrections, formulas and tables and further literature code or data directly to original research paper. It is licensed under CC-BY-4.0 thus allowing reuse while proper attribution of the author.

iv. **Pubreader** : It is an alternative web presentation offers another, more user-friendly experience to read articles in PMC and BookShelf and it has designed especially for boosting reading experience on tablet and other small screen devices. It's main aim is that discover scientific literature in most comfortable way.

v. **Ref-N-Write** : it is wonderful research instrument for researcher at primary phase and non-native English speakers, This MS Word add-in tools allow researchers to import articles in to word and while writing research paper, it assists you search related document similar like Google Search engine and it has 20,000 scientific/academic phrases and templates and it useful to check duplicate paragraph or self plagiarism after import document in this to avoid misconduct.

Data visualisation tools	url
Wizdom	https://www.wizdom.ai
eLifescience	https://elifesciences.org
Paperhive	https://paperhive.org
Pubreader	https://www.ncbi.nim.nih.gov/pmc/about/pubreader
Ref-N-Write	https://www.ref-n-write.com/trial

1.1 Data visualisation tools used to enhance quality of research

4.3 Open access bibliography manager and Social bookmarking tools :

i. **Bibsonomy** : It is blue social bookmark and publication sharing system and an easy way to handle scientific publications and bookmarks and assist you to collaborate with your colleagues and explore new interesting material for your research.

ii. **CiteULike** : It is free online web based bibliography manager and social bookmarking service, it allows you to post, view and organise scientific papers, many journal services having this option and at one click allow to you for saving references and it also allows to post links on variety of social networking sites like facebook, twitter etc., and it's useful to share reference lists publicly.

iii. **Zotero** : It is an open source citation management software to manage bibliographical data and related research literature. The attractive features consists of web browser integration, online syncing, generation of in-text citations, footnotes and bibliographies utilised with MS Word, Libreoffice writer and Google Docs. It has also launched the online bibliography tool

ZoteroBib in May 2018, here patrons can generate bibliographies without installing or creating account in Zotero. It can import data from Google Scholar, Web of Science and Scopus to offer bibliography service.

iv. **JabRef** : It is open source reference management software typically used for LaTex and the name Jabref stands for Java, Alver, Batada, Reference and supports 15 citation formats and offers powerful search tools . It can import bibliographic the data from Arxiv, CiteseerX, Google scholar, Medline, IEEE Explore and Springer and many online scientific databases. Retrieval of scientific literature and citation information based on ISBN, DOI, PubMed and arXiv-ID. It can search, filter and detect duplicate citations.

v. **Docear** : It is an open source and free academic literature suite, helps to organizing, creating and discovering literature A one user-interface that allows you to organize your literature in descriptive manner. With Docear, you can sort documents into categories; you can sort annotations (comments, bookmarks, and highlighted text from PDFs) into categories; you can sort annotations within PDFs; and you can view numerous annotations of multiple documents, in multiple categories at one. It combines several tools in a single application (pdf management, reference management, mind mapping). This allows you to draft your own papers, assignments, thesis, etc. And suggest papers which are free, in full-text, instantly to download, and tailored to your information need.

vi. **Mendeley** : It is open source academic social network and reference management software allows researchers to collaborate online with others and automatic extraction metadata from PDF files and supports all operating systems and file formats.

vii. **BibTex** : It is web based bibliography management program used for typesetting in conjunction with Latex software and organize your citations and build bibliography within article created with Latex. In this platform, bibliographies can be preserved in any general citation manager and ouput in this format for addition to your Bibtex reference file.

Open source citation tools	Url
Bibsonomy	https://www.bibsonomy.org
CiteULike	https://www.citeulike.org
Zotereo	https://www.zotero.org
JabRef	https://www.jabref.org
Docear	https://www.docear.org
Mendeley	https://www.mendeley.com

4.3 Open source citation and social bookmarking sites

5. Conclusion :

These tools are very much useful to the scientific research scholars to design their research in an effect manner and enhance the quality of research output and increase citation count of their publications. These tools assists the scientists in trace, collect, analysis, evaluate and publish and share of data for research operations and these are very helpful to the researchers to overcome from the hurdles in locating and collecting the related scientific literature to the problem and avoid information gap in the process of research to keep up-to-date in their subject areas.

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Digital Library services provided by Art's, Commerce and Science college Libraries of Mumbai city in Covid-19 Pandemic

Mr. Hemant Fransis Jadhav[*]

Abstract-

Covid19 pandemic has effects to every sector of society. Academic libraries are one of them. In these covid19 pandemic academic libraries have no any chance to provide traditional library services to users. This research study basically focuses on Art's, Commerce and Science college libraries of Mumbai city. There are major impacts of covid19 in Mumbai city and Maharashtra government has extended lockdown period. This study is trying to search work pattern of college libraries in Mumbai city in covid19 pandemic. The research study is trying to known about various digital library services provided by college libraries in lockdown period. This research study also focuses on problems faced by librarian while providing digital library services.

Keywords: Covid19, College Libraries, Digital library services.

1. Introduction

In covid19 pandemic the mode of education is fully changed. From previous some years we are trying to change our education system from traditional to ICT based education system. We are using both online and offline education system. With the changing these education system academic libraries also accepted these challenges

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* Librarian, KES Anandibai pradhan Science College, Nagothane
Affiliated to University of Mumbai
Email –hfjadhav@gmail.com

and provide traditional as well as ICT based library services to the users. Academic libraries introduced so many library services which can fulfill the user information needs. In the pandemic of covid19 the situation has changed. There is no any chance for librarian to provide traditional library services to users. To connect with users and satisfied their information needs libraries have automatically transfer in fully ICT based services

2. Mumbai city education and Covid19 pandemic

Mumbai has not only been the financial capital of India since the early 19th century, the capital city of Maharashtra has also been home to prominent education institutes since pre independence. In Mumbai city has so many Universities, Research Institutes and colleges like University of Mumbai, Tata Institute Of Fundamental Research, Baba Atomic Research Centre, Narsee Monjee College of Commerce & Economics etc. The total Literacy Rate is 85.6%. There are 12 universities in Mumbai city. In covid19 pandemic all the University, Research Institution and college has been locked. Libraries are playing major role to provide information library services and research based services to users.

3. Digital library services and activities in covid19 pandemic

With the development in ICT, libraries have provided traditional as well as web based services to their user. There are so many ICT based information services. The success of these services depends on ICT skills adopted by librarian and library staff. Following are some information services we can provide to library users in this covid19 pandemic.

1. Access to electronic reference books and textbooks (Special subjects or Multidisciplinary subjects)

2. Access to electronic databases.

3. Access to electronic journals.

4. Searching and downloading online information resources and forward to students and staff.

5. Current awareness services on demand basis.

6. Research support services.

7. Organized online library orientation, workshop and book exhibition.

8. Organized online reading and discussion groups.

9. Provide the public health awareness and update information regarding Covid19.

10. Provide UGC update guidelines and Government GR and news related to Covid19 to staff as well as students.

4. Review of Literature

Mehta, D., & Wang, X. (2020) In this research paper, researchers have studied in Maxwell Library of Bridgewater State University (BSU), Bridgewater, Massachusetts, USA. Researchers have studied on various aspects of Maxwell library services in Covid19 pandemic. The study shows that Maxwell library has introduced new initiatives in such digital services as references, BI, the provision of the subscribed e-resources, course reserves, free e-Textbooks. Maxwell library has taken initiative awareness of OER materials, institutional repository. The study also shows that online services have increase through email and SMS and phone**.**

Obeidat, O. A. (2020) In this research paper, researchers have evaluated the level of perception of university students of electronic library services as well as the extent of integration of the elements of electronic libraries into the services of classic and digital academic libraries. This study collected data from Jordian Universities. The results indicated that users' reactions were very good, and accessing databases through the Internet was the most perceived aspects. One of

the implications for academic digital libraries is what is related to provision of digital content and services in Internet environment.

5. Research Objectives

1. To find out the various online services provided by college libraries in covid19 pandemic.

2. To find out the co-relation between librarian and users in covid19 pandemic.

3. To find out various ICT skills adopted in lockdown period by librarians.

4. To find out problem faced by college libraries to provide online services to their users.

6. **Scope of the Study:**

The scope of study is limited to Arts, Commerce, Science college libraries in Mumbai city. There are 82 Art's, Commerce and Science colleges in Mumbai City. These colleges are affiliated to University of Mumbai.

7. Research Methodology

The Survey method was used for this study. The Google form questionnaire has been prepared for collection data. Google form questionnaire sent to librarian email id. Out of 82 colleges 74 colleges has filled Google from questionnaire.

8. Analysis and Interpretation

We have received 74 out of 82 Google form questionnaires sent amongst the Art's, Commerce and Science College librarians. The rate of respondents is 90.24%.

1. **Age of Librarian**

Table No. 1

Age of Librarian	Respondents	%
20-30	13	17.57%
30-40	28	37.83%
40-50	24	32.44%
50-60	9	12.16%
Total	**74**	**100%**

It is observed that 37.83% Librarians age is bet 30-40, 32.44% librarian age bet 32.44%. It is cleared that most of the Librarian are in young age.

2. **Work Experience**

Table No. 2

Work Experience (In Year)	Respondents	%
1-5 Years	7	09.46%
5-10 Years	15	20.27%
10-15 Years	18	24.32%
15-20 Years	22	29.73%
20-25 Years	9	12.16%
25 Above	3	04.06%
Total	**74**	**100%**

The table No.2 shows that 29.73% librarian have experienced between 15-20 years. Below them 24.32% librarian have experienced between 10-15 years and 20.27% librarian have experienced between 20.27%. It is cleared that most of colleges have experienced librarian.

3. Courses Conducted in College

Table No. 3

Courses Conducted in College	Respondents	%
UG	74	100%
PG	74	100%
M. Phil	21	28.38%
P. hd	21	28.38%

Table No.3 Shows that 100% Art's, commerce and Science Colleges have run UG and PG Courses. It is observed that 28.38% colleges have run M. Phil and P. hd courses in their college. 28.38% colleges have Mumbai University research centre. It is cleared that most of college library user's needs research information in their respective field. They need of library services in lockdown period.

4. Separate library websites

Table No. 04

Library website	Respondents	%
Yes	74	100%
No	00	00%
Total	**74**	**100%**

Table No.04 shows that 100% college libraries have their own library websites. It is cleared that Art's, Commerce and Science College libraries are created separate library website and share library information through the website.

5. Institutional Repository

Table No.05

Institutional Repositories	Respondents	%
Yes	56	75.68%
No	18	24.32%
Total	**74**	**100%**

Table No.05 shows that 75.68 College libraries have institutional repository. It is cleared that 75.68% libraries have created e-content and stored in their repository.

6. E-resources

Table No.06

E-resources	Respondents	%
Databases	32	43.24%
E-books	74	100%
E-journals	74	100%
E-thesis, e-dissertations, e-projects	25	33.78%

Table No.06 shows that 43.24% college libraries have databases. 100% college libraries have e-books and e-journals. 33.78% college libraries have e-thesis, e-dissertation, e-reports. It is cleared that Art's Commerce and Science college libraries have given importance to print resources as well as e-resources.

7. Platform for access e-resources

Table No.07

Institutional Repositories	Respondents	%
IP base	08	10.81%
User Id Based	66	89.19%
Total	**74**	**100%**

Table No.07 shows that 89.19% college libraries are User Id Based access provides to users. 10.81% college libraries IP based e-resource. 10.81% college library users are unable to library e-resources from home.

8. Use of Social media for communicate with library users

Table No.08

E-resources	Respondents	%
Whats up	50	67.57%
Telegram	57	77.02%
Facebook	65	87.84%
LinkedIn	30	40.54%
Twitter	22	29.72%

Table No.08 shows that 87.84% college libraries have facebook page and they are communicate and share information through this webpage.77.02% college libraries use telegram and 67.57% use whtsup. Linkedin and twitter are less use for communicated with the library users. It is cleared that college libraries so many social media to communicated with library users.

9. Platform to provide library services

Table No.09

Platform to provide library services	Respondents	%
Through library website	74	100%
Through personal email address	45	60.81%
Through the social media like whats up group, telegram group	65	87.84%

Table No.09 shows that 100% college libraries provide library services through library website. 60.81% libraries provided services through personal e mail address. 87.84% libraries use social media for provide library services to users. It is clear that library website is very effective tool for provide library services in this lockdown period.

10. Library services provided in this lockdown period

Table No.10

Library services provided in this lockdown period	Respondents	%
Access to electronic reference books and textbooks (Special subjects or Multidisciplinary subjects)	66	89.20%
Access to electronic databases	32	43.24%
Access to electronic journals	66	89.20%
Current awareness services on demand basis	70	94.59%
Research support services to faculty and students	48	64.86%
Provide the public health awareness and update information regarding Covid19	74	100%
Provide UGC and Govt GR and news related to Covid19 to staff as well as students	74	100%

Table No.10 shows that 94.59% libraries provide current awareness services on demand basis. It is observed that librarians are connected with users in this lockdown period. 100% libraries provides update information and UGC circulars, Government GR to the Students and faculty.

89.20% libraries provide e-books and e-journals to library users.

11. Library activities conducted in lockdown period

Table No.11

Library activities conducted in lockdown period	Respondents	%
Online library orientation	36	48.65%
Online book exhibition	49	66.22%
Online book review	18	24.32%
Online library lecture series	25	33.78%
Online quiz	55	74.32%
online library workshop for library users	35	47.30%
Covid19 awareness programme	68	91.89%
Organized webinar, conference and workshop	15	20.27%

Table No.10 shows that 91.89% college libraries have conducted Covid19 awareness programme. Its cleared that knows the first priority of library actives was make Covid19 awareness in their users. 66.22% libraries organized e-books exhibition. It is observed that most of libraries were trying to introduce their e-books to their library uses. 47.30% libraries organized workshops for library users. It is observed that libraries were trying to how to uses library e-resources. 20.27% libraries are organized webinar, conference and workshop in library and information science field.

12. Attend programme to update yourself and adapted any ICT skills in this lockdown

Table No.12

Attend following programme to update yourself and adopted any skill in this lockdown	Respondents	%
Webinar	74	100%
Online conference	74	100%

FDP	55	74.32%
online workshop	40	54.05%
MOOC Courses	21	28.37%

Table No.12 shows that 100% librarians are attend webinars and online conferences. 74.32% librarians have done FDP. 54.05% librarians have done online workshops. Only 28.37% librarians have done MOOC course. It is observed that librarians have taken advantages of this lockdown period and update their subject knowledge and acquires new ICT skills.

13. Problems faced providing library services and conducted library activities

Table No.13

problem faced providing library services and conducted library activities	Respondents	%
Support of Managements	45	60.81%
Support of library staff	56	75.67%
poor Knowledge of ICT	20	27.02%
Necessary Equipment	60	81.08%
Funds from College	52	70.27%

Table No.13 shows that 81.08% libraries have faced problems regarding necessary equipments. 70.27% libraries have faced problems regarding funds from colleges.75.67% libraries faced problems regarding library support staff. It is cleared that if the management support librarian and provide funds and necessary equipments librarian can provide more effective and efficient services to college students and staff.

9. Finding and Suggestions

The study is revealed that internet is most preferred medium for provide library services in this lockdown period. The finding and suggestions of this study as follow

- It is found that most of librarians are in young age. Most of librarians have experienced as a librarian.

- Most of the colleges run UG and PG courses. 21 colleges have University of Mumbai research centre. They provided M. Phil and P. hd courses.

- All college libraries have their separate library website. 75.68% libraries have created Institutional repositories. It is necessary for every college to create institutional repository and provide e-content to library users.

- It is good things that all Arts, Commerce and Science college libraries have e-resources and 89.19% college libraries provide this e-resource on user id base. 10.81% college libraries have IP based e-resources. This college should have changed their policy and provide user id based e-resources.

- All librarian use social media like whats up, Telegram, Facebook, Linkedin, Twitter. It is found that facebook is most popular social media in college librarians.

- 100% college libraries provide library services through library websites.

- College library should be increase research support services to students and faculty and encourage them for doing research.

- All librarians have great opportunities to acquire new knowledge and adapt new ICT skills and provide new innovative library services to library users.

- It is found that only 27.02% librarian is facing problems of poor ICT knowledge. Most of librarians have great ICT knowledge but they are facing problems regarding support of management, library staff, necessary equipments and funds from college. If the management provides support to librarian they can provide effective and efficient library services.

10. Conclusion

Covid19 has fully changed in the mode of library services. Covid19 pandemic has get advantage to libraries because before the covid19 pandemic libraries were provide digital library services to users but there were no awareness about these services in users. This study shows that the awareness and demands of digital services have increased. Arts, commerce and Science college libraries in Mumbai city are effectively and efficiently providing digital library services in covid19 pandemic. There are some problem faced by libraries support of Managements and necessary equipments. In this covide19 pandemic Social media is became a strong bridge between libraries and users. Librarian are using Social media like facebook, Whats up, Telegram, Twitter etc for connect with users.

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Use of Digital Library Resources Amidst Corona Pandemic : A case study of JNKVV Jabalpur

*Siddarth Nayak**
*Vinita Pandey**
*Pradeep Dixit**
*Preeti Sagar Nayak**
*S.K.Jain**

Abstract:

Libraries are unexplored universe of information and information resources. The utility and usefulness of libraries never decreases but is realized belatedly. Library webpages are a platform for providing access to digital information resources to its users round the clock. University library webpage has huge digital content and also provides external links to various e-resources that are useful for students, scholars and faculties. The only need is to access and browse the library webpage for acquiring information.

Keywords: library, e-resources, webpage, internet, University, awareness, accessibility

Introduction:

Primary goal of libraries is to disseminate information for knowledge generation (Nayak *et al*, 2016). The Central Library and other constituent libraries of Jawaharlal Nehru Krishi Vishwa Vidyalaya, (JNKVV) Jabalpur have been supporting the teaching (undergraduate,

* Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
Corresponding Author* c_lib@rediffmail.com

post graduate and doctoral), research, extension, training and other educational needs activities since the inception of the University. According to Oinam (2018), libraries have been regarded as important pillars of any educational system and the main function of library is to educate and giving a helping hand to find proper resources. Libraries always aim to get its resources utilized to the maximum possible extent but Lawson (1969) found that the services of libraries were under-utilized. Most important thing for librarians under present Corona pandemic is to ensure digital availability or resource that ensures timely completion of the student syllabus and research and reference need of post graduate and doctoral students. It is the need of the time to encourage students for utmost utilization of its e-resources.

Under present situation of carona pandemic, libraries need to free itself from physical barriers like library building, classroom/meeting room, seminar hall, ARIS etc and instead make itself digitally available to its users. In the view of Burke (2013) crucial element to a library's success is its online web presence and the main idea is that students can learn wherever they are at present and whenever they wish according to their preferred time. According to Rajput *et al* (2015) Library and reading go hand in hand, but in the words of Popoola (2008) information availability does not mean accessibility and utilization and also information sources which users are not aware of will be underutilized. E-resources have become an integral part of the information resources for academicians and researchers and can substitute print resources (Mardhusudhan, 2010). Also, e-resources are easily accessible in the remote areas (Khan, 2016). The e-resources provide fast and reliable (Kumar & Sampath, 2008), up-to-date literature, which is less expensive and saves time more than print materials (Mardhusudhan, 2010).

Library digital contents and webpages are an effective and efficient medium for information dissemination, research support and syllabus completion particularly for undergraduate, post-graduate and doctoral

students. According to Morgan (2000) library portals were defined as user-centered, customizable interfaces to collections of library resources. The importance of library webpage's is particularly more during corona pandemic as library users cannot be physically present in the Library. To be relevant in the present day context, libraries need to go beyond their physical boundaries and working hours; to potentially expand library services and facilities to users located far-off (De, 2012).

JNKVV Satyanarayan Sinha Central Library

The Central Library of the University came into existence in the year 1965, the Central Library was shifted to its new building on 26th February 1975 and from then it was known as Satyanarayan Sinha Central Library (Rajput *et al*, 2015). Agricultural University library are the treasure houses of information resources (Deshmukh, 1980). The Central Library is in possession of 63840 Books, 9317 Theses, 15662 Bound Volume Journals, 3958 e-Journals and 1191 e-books access through CeRA, 4800 theses submitted to the University from the year 1990- 2017 have been digitized (JNKVV, 2018). The webpage of the Satyanarayan Sinha Central Library with various useful links can be accessed at

http://jnkvv.org/eLIBRARY/eLIBRARY_Overview.aspx

Useful Links in the Library webpage

Theses Database

A database of theses awarded by the University is listed; the theses database contains 2865 M.Sc (Ag.), M.Tech (Agril. Engg.), M.V.Sc and Ph.D theses of Agriculture, Agricultural Engineering and Veterinary faculties from 1960 to 2012. The database also contains 509 theses awarded during the year 2017 and 2018. Compilation and updation is in progress for remaining theses. For the ease of handiness the theses are tabulated as for Accession no., Student Name, Title of the Thesis, Year, Name of Major Guide, Degree (Post-graduate &

Doctorate) and Department. The students are able to search and locate the research work according to their need and requirement. The theses database also aid in prevention of duplicity and plagiarism. The thesis database webpage can be access at

http://jnkvv.org/eLIBRARY/eLIBRARY_Thesis.aspx.

Online journals CeRA

This part of the library webpage is the most used as soon as online journals CeRA is clicked a new website is https://jgateplus.com/ opened where about 2923 online journals are accessed through Consortium for e-Resources in Agriculture, India (CeRA). The journals are available in the six broad subjects as Agricultural & Biological Sciences, Arts & Humanities, Basic Sciences, Biomedical Sciences, Engineering & Technology and Social and Management Sciences as FT - Full Text; AL - Available in Library; RA - Request Article; FL - Find in a Library. The Jgate website offer the user to make Basic Search, Browse journals A-Z, search author in the Author Finder, do Advanced Search and save Search History and to view Marked Results. The Jgate website is particularly useful for scientists, faculty members, post-graduate and doctoral scholars.

On clicking the caption 'India Agristat' written in the centre of Jgate website a new portal http://www.indiaagristat.com/ is opened all types of statistical data related to agriculture is available on the India Agristat website. In other words the website contains

Socio-economic statistical information about agriculture in India. The statistical data is available in tabular and year wise basis for the ease of access. The India Agristat website is very useful for supporting the research findings and for getting secondary data

On clicking the caption Educational information on use of CeRA placed at the end of library webpage a very useful video link is opened as https://www.youtube.com/watch?v=TnKXNXrpZkE. If anyone is

facing difficulty in the use of CeRA then this video will clear all the doubts and facilitate the beneficial use of website.

E-courses:

All undergraduate courses in Agricultural, Veterinary & Animal Husbandry Agricultural Engineering, Home Science, Dairy Technology etc are available online. On clicking the caption 'E-courses' on the webpage external website gets https://ecourses.icar.gov.in/Home1.aspx opened which prompts the user to access online e-Courseware or to downloads offline e-Courseware. Registered user can access the online courses for timely completion of their syllabus.

Table 1. University wise users registered for offline e-courses downloads

S.No.	Type of User	No. of Users
	Administrator	8
	Faculty	105
	Other	78
	PG-Student	195
	PHD-Student	61
	Teacher	36
	UG-Student	586
	Total Users	1069

(Source https://ecourses.icar.gov.in/)

Table 2. University wise degree courses downloads status

S.No.	Course	Total
	B. Sc. (Hort.)	524
	B.V.Sc.(VT. & AH)	67

	B.F.Sc.(Fisheries Sci.)	33
	B.Tech. (Dairy Tech.)	144
	B.Sc.(Home Sci.)	78
	B.Tech.(Agri. Eng.)	1443
	B.Sc.(Agri.)	3905
	Total	**6194**

(Source https://ecourses.icar.gov.in/)

The e-courses thus designed are informative and useful for their academic needs the website was accesses on 16th April 2016 and the data presented in Table 1 & 2 reveal that 1069 users registered, for offline e-courses downloads whereas 6194 users downloaded degree wise courses at JNKVV, Jabalpur.

Resources:

Various resources are available under this section as soon as the caption Resources is clicked, Link of NIPAERS-https://www.nipaers.com/signup open up. The user has to get registered and after that access to e-book and online practice papers is provided. Presently this facility is given by NIPA Genx Electronic Resources and Solutions Pvt Ltd.

Online Library Catalog (OPAC)

The ALA glossary defines Online Public Access Catalogue (OPAC) as follows: a computer-based and supported library catalogue (bibliographic database) designed to be accessed via terminal so that library users may directly effectively search for retrieve bibliographic records without the assistance of a human intermediary such as a specially trained member of the library staff. The OPAC of library is open and is available to its users through internet on any connected device like desktop, laptop, tablet, mobile etc. All accessioned reading materials in libraries are traceable and its availability can also be

checked. As soon as the user clicks Online Library Catalog (OPAC) caption an external website http://jnkvvopac.bestbookbuddies.com/ opens which allows searching reading material of Central Library, Jabalpur and for college libraries of College of Agriculture, Ganjbasoda, Powarkheda, Rewa Tikamgarh and Waraseoni, apart from College of Agricultural Engineering Jabalpur. The website also gives information about new arrivals and top circulating books. The website also provides access to about 25 national newspapers also.

New Arrivals

The New Arrivals section makes us aware of the incoming reading material and webpage is accessible at http://jnkvv.org/eLIBRARY/-eLIBRARY_NewArrival.aspx. The weekly arrival of Gazettes, Journals, Annual Reports, Magazines, Monograph, Reference Books and other reading material are made available on the library webpage so that the users are able to access it when they visit the library and prior to their visit they know what resource they want and can easily access it saving their precious time.

NISCAIR Online Periodicals Repository

NISCAIR stands for National Institute of Science Communication And Information Resources and it works under the aegis of Council of Scientific and Industrial Research (CSIR). The main mandate of NISCAIR is to provide formal linkages of communication among the scientific community in the form of research journals in different areas of S&T. NISCAIR Online Periodicals Repository is known as NOPR. As soon as the NISCAIR Online Periodicals Repository caption on the library webpage is clicked it takes us to http://nopr.niscair.res.in/ where the under-mentioned journals and magazines can be accessed, back volumes are also available and full texts are downloadable.

1. Annals of Library & Information Studies
2. Applied Innovative Research
3. Bhartiya Vaigyanic Evam Audhyogik Anusandhan Patrika
4. Indian Journal of Biochemistry & Biophysics
5. Indian Journal of Biotechnology
6. Indian Journal of Chemical Technology
7. Indian Journal of Chemistry Section-A
8. Indian Journal of Chemistry Section-B
9. Indian Journal of Engineering & Materials Sciences
10. Indian Journal of Experimental Biology
11. Indian Journal of Fibre & Textile Research
12. Indian Journal of Geo-Marine Sciences
13. Indian Journal of Natural Products and Resources
14. Indian Journal of Pure & Applied Physics
15. Indian Journal of Traditional Knowledge
16. Indian Science Abstracts
17. Journal of Intellectual Property Rights
18. Journal of Scientific & Industrial Research
19. Journal of Scientific Temper
20. Medicinal & Aromatic Plants Abstracts
21. Natural Products and Resources Repository
22. Science Ki Duniya
23. Science Reporter
24. Vigyan Pragati

Krishi Kosh

On clicking the Krishi Kosh caption on the library website an external website is opened with a web address of http://krishikosh.egranth .ac.in/

Krishi Kosh - is a digital repository of accumulated knowledge in agriculture and allied sciences, having collection of old and valuable books, old journals, thesis, research articles, popular articles, monographs, catalogues, conference proceedings, success stories, case studies, annual reports, newsletters, pamphlets, brochures, bulletins and other grey literatures spread all over the country in different ICAR Research Institutions and State Agricultural Universities (SAUs) It also contains M.Sc. and Ph.D. thesis/dissertations with their full contents, presently Krishi kosh is providing access to 149591 theses, 17690 journals and 13814 articles to its users apart from many other resources (http://krishikosh. egranth.ac.in/)

Krishi Kosh provides various search options to facilitate its users, searches can be done at various levels apart from search by title, author, type, subject, keywords, date issued, items with attachment and institution wise. All this provision is made to make possible that the user gets what resource is needed. The Krishi kosh is very useful and provides the data which is required, since it has no barrier hence it can be accessed from anywhere.

In the end of the library webpage a caption Educational information on use Krishi Kosh is given, the users who face difficulty is accessing Krishi Kosh are requested to click the caption so that an external video on youtube with a web address of https://www.youtube.com/watch? v=UcixUqa12-A is opened, the detailed use on how to access and search Krishi Kosh digital repository is explained

Conclusion

JNKVV Satyanarayan Sinha Central Library has made its presence in the digital space; information is available on the website but the rate of information retrieval needs to be enhanced so that it is available to its users in time. Amidst corona pandemic and in the regime of social distancing there is a need to increase the use of digital resources and the library website is the most vital platform to make information available in an effective and efficient manner and at your convenience. To finish according to Eyiolorunshe and Eluwole (2017) faculty members should be made to know what they stand to gain when they form the habit of using library resources.

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Digital Library Research: Current Developments and Trends

Rahul Dabra[*]
Vipin Garg[*]

Abstract:

Digital libraries studies has attracted a good deal attention inside the mainly advanced or a number of developing nations. While nearly virtual library research tasks are fund supplied by means of government organization and country wide and global our bodies, some are run by way of exact educational and research establishments and libraries, either for my part of collaboratively. The digital library is the researcher laboratory to the actual life environment.

Keywords: Digital Library, Developing Nations, Information, Electronic Libraries, Metadata, Electronic sources, Digital library literature

Introduction:

Valuable adjustments seen by way of society thru the transfer of facts everywhere the earth and it is responsible ti the groth of data generation. Now it's miles possible to compile and having access to know -how within the digitized from besides renovation of conventional information due of use of facts era. command for electronic knowledge raise. Each day and the all time conventional format of library turning into farther luxurious and complex meet needs and complex to hold. Now the time of libraries to maximize those demanding situations and meet need and expectations of virtual

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* Professional Assistant Nit, Kurukshetra

user. Libraries has to redesign their services to develop free addition to fulfill the patron's society. While a few virtual library tasks, inclusive of the DLINOR project within the United Kingdom, the first 2 phase of the Electronic Libraries Programme within the United Kingdom and the primary phase of other tasks are presently beneath way in extraordinary components of the arena.

Digital Library:

Digital Library is a basis that reconstruct the expertise and helps of traditional library of digital shape. Digital Library is convey together series of statistics, with the supported services and an area wherein the statistics is stored in the virtual layout and can be get better above a networks. It enclude of digital rely which interconnected thru installing area link, metadata or truely query based completely courting and software utility utility which can also additionally moreover additionally use primary pages in hyper text of markup language or primarily based simply mostly on database control tool. It may be interpreted on the concept of above definition that a unmarried net net net page or collection mass virtual information isn't constantly a digital library. Here, it is is vital to have a look at that the digital libraries isn't always going to update traditional libraries. Basically, virtual library is needed technological useful resource to hyperlink the sources of many offerings which may be disseminated to purchaser. Collection of information isn't restrained to file garage but its prolonged to digital arte statistics of the most effective be allotted in digital formats**.**

Review Of Literature:

That phase on the object speak approximately its studies associated with patron's experience with virtual library.Its may be beneficial to apprehend character's opinion, mind-set, fulfilment and carrier reviews of the digital library which may be other taken into consideration for enhancing consumer's delight closer to the use of digital library Ekere et al (2016) examine the sensibility of customers

towards virtual library centers, resources and offerings and discovered that customers are especially satisfied with it. Users are significantly aware and happy about the digital library assets such and world wide web, wireless fidelity and serps examine to online databases, portals, online summary, video Compact Disc, CD-ROMs, and on line indexes and abstract.

Digital Library resources includes:

Collection wherein complete contents files are created or transformed in gadget-readable shape for on-line get admission to

Scientific statistics units

Scanned pics, pix of photographic or published text and so on

Computer garage gadgets' which include optical disk.

CD- ROMs/ DVDROMs

Databases accessible thru internet and other networks

Online databases and CD-Rom data merchandise specially those with multimedia and interactive video additives

Digital audio videos or complete length movie

Advantages of Digital Library Resources:

Electronic sources provide libraries and their uses many benefits. There are several blessings of the use of e-resources consisting of case of usability, affordability and accessibility. They can growth pace and case to get entry to and the amount of data available. They can save library area and body of workers time.

all libraries economic, area, get entry to and provider hassle. Most libraries keep to operate in dual surroundings print and electronic assets, whether or not physically located within a library or accessed via a community, are part of the library's collection and should be

evaluated and assessed with the equal standards and rigor applied to all collection choices.

Why We Need Digital Library Resources ?

Due to the boom in the statistics era the mission of series, enterprise and retrieval of data made the venture very tough. That is why maximum of the libraries best electronic sources to print collection for optimum use. The other reason are physical space, escalation in journals charges, digital literacy has pressured the libraries to opt for electronic assets in an effort to meet information needs of huge network of users. Digital library can store a large volume of digital information in archival shape. A virtual library may refer only to digital sources or mean a mixture of electronic sources, services that guide using those sources or mean a aggregate of digital resources, offerings which are furnished thru a network. It gives the users fast search equipment, on the spot get entry to to the rapidly growing data in multimedia form quick on the display in an interactive mode.

Types of Digital Library Resources:

Online E-resources

E – journals (Full text and Bibliographical)

E- Book

Online databases

Websites

CD-Rom

Diskettes

Other portable databases

Conclusion:

Digital / E- Library Resources represents many demanding situations at each level in their choice, acquisition, protection, protection and

control. The identical time the e-sources have blessings giving solution to many expert troubles like area, presenting far off

access, convenience in use, multiplied readership with enhance offerings. Recent studies also proved that the e-sources are to be had specially the optical disk formats. And keep the time by means of researchers, faculties. In such situation and destiny trend, library professionals shall ought to cope up with new rising digital environment and devise excellent feasible strategies and approach of dealing with those resources successfully and efficiently for his or her advanced availability and accessibility.

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Role Of Librarians In The Digital Era

Pratibha Pandey[*]

Abstract

This paper focuses on the challenging role of librarians in the digital era. The responsibilities and challenges for a Librarian has increased manifold with the advent of ICT (Information Communication and Technology). They need to work on acquiring latest information retrieval skills and keep them updated about the latest developments in the field of Library and Information Science and for successful functioning of digital libraries.

Keywords

Role of Librarians, digital era, ICT, digital literacy, digital library

Introduction

Librarians are professionals who are trained in the acquisition, organization, retrieval, preserving the printed documents, dissemination of information and guide the users in retrieving the information of their choice. The information explosion on the internet is posing a great danger to the existence of traditional gatekeepers of knowledge as their skills are ignored and their advice is not taken. Search engines are sending users straight to the information they require but they are not acknowledging the role of librarian as an intermediary who can classify, catalogue and give advice on the information retrieved. Information is electronically available in a wide variety of formats (audio, video & multimedia). Librarians help in

[*] Librarian, Post Graduate Govt. College, Sector-46, Chandigarh,
E-mail : pratibhapandey81@gmail.com

finding the required piece of information for use for personal and professional purposes.

The librarians are facing new demands, new expectations, new challenges, new competitors and advent of variety of information retrieval tools. They need to polish their skills for handling new technologies. For successful working in digital library environment they should acquaint themselves in theoretical and practical aspects of ICT applications in Library.

Definition

According to **Wiederhold** "A **digital library** is popularly viewed as an electronic version of a library where storage is in digital form, allowing direct communication to obtain material and copying it from a master version.

"**Digital Library** is a combined technology and information resources to allow remote access, breaking down the physical barrier between resources".

Digital library is not only digitization of physical resources, but also thoughtful organisation of electronic collection for better access.

Role of Librarians in creation of Digital Libraries

In the age of Information Explosion, the Librarians need to update their skills for Information retrieval, packing and repackaging of information and guiding the users to retrieve appropriate information. For organizing vast information the Librarians need to acquire more skills.

It should be taken as an opportunity to showcase their newly acquired skills of retrieving information with the widespread usage of sources available on Internet. The users will be more than happy in accepting help from technology savvy Librarians. Information Professional has to work as

1. **Librarian-** In addition to their traditional role as Librarian they are dealing with the technology in processes of collection development and information retrieval.

2. **Information Manager-** To meet the demand of users in the age of information explosion. They should be capable of delivering right information to the right user at the right time.

3. **Information Instructor-** As part of Information Literacy programme, they should teach the users/staff how to access relevant source of information.

4. **Information providing network-** Librarians should be able to design a successful network/system for appropriate delivery of information to the users.

   The LIS professional should be well trained and have acquired requisite knowledge and skills for successful functioning of Digital Libraries.

1. **Necessary knowledge skills for Librarians:**

   - Information/Knowledge Resources (books, journals, internet and e-resources).

   - Use of computers, online catalogues, websites, LAN, Servers etc.

   - Financial budget resources.

   - Skills for manpower training.

2. **Skills for LIS professional in the digital age:**

   - Be resourceful.

   - Able to provide quality services.

   - Knowledge of information resources.

   - Knowledge of information seeking behaviour of Users.

- Able to accept change.

- Be adoptive, flexible and resistant.

- Keep abreast with the latest technology.

- Possess excellent communication skills.

3. **Knowledge of IT:**

- Operating Systems – Windows, UNIX, LINUX.

- Word processing, Graphics, Spread sheet & Presentations.

- Database management systems.

- Networking.

- Making of Blogs and websites.

- Internet usage.

- Knowledge of Library Software packages.

Leadership Role The Librarian as a custodian of Information resources should emerge as a successful Leader for guiding the users in retrieval of information of their choice and also for disseminating e-literacy to users.

Librarians as resource person for Information seeking users The Librarians consider the need and interest of its users.

The following points must be considered in dissemination of information in digital environment:

- It must be easily retrievable.

- The information must be according to the requirement of its users.

- Intelligent search engines must be used.

- Attractive user interfaces need to be introduced.

- Reasonably priced.

The role of librarians in digital era is now more important as they need to satisfy the information needs of research scholars and young users who rely heavily on internet. The knowledge of designing, developing and maintaining of digital content management and access, evaluate, recommend and standards for utilizing computer software in process of creating and preserving digital collections and resources is an important prerequisite for LIS Professionals.

SKILLS For the successful functioning of digital libraries, it is essential the Librarians are well trained and possess requisite knowledge and ICT skills.

Technology Skills These are the skills related to computer operations, creation of online databases, designing of websites, telecommunication media and searching of information through internet resources.

Skill of Using Internet Librarians must be familiar with LAN, MAN and WAN as well as using Internet and other library Networks like INFLIBNET, CALIBNET and DELNET.

Skill of using Computer Communication Networks Resource sharing and dissemination of information is possible only with the proper computer networking skills. The knowledge of network protocols like TCP/IP, HTTP, FTP etc. must be acquired by LIS Professionals.

Information Retrieval Skill The librarians should possess the technology skills for collection and organization of data in electronic form, indexing techniques, searching techniques and selection and evaluation of resources. The librarians should be able to help its users by providing retrospective searches, ready reference services, bibliographic services, selective dissemination of Information services etc.

Traditional Skills of Librarian These skills are the basic skills required by a librarian to work in a traditional library. It also includes knowledge about classification and cataloguing techniques. This will help in setting digital libraries.

Communication skills The Librarians act as an intermediary between users and digital resources so they should be having following qualities:

- Effectively negotiate with management, publishers, customers and vendors.
- Effective listening skills with staff and users.
- Effective decision makers.
- Communicate the value of digital library resources to staff and users.

Managerial Skills The librarians acting as information managers should have some basic managerial skills for managing the finance and human resource aspects of digital library. Time management skill is also an important managerial skill for a successful librarian.

Preservation Skill The librarian should be able to preserve e-resources too and for this they should be aware of different anti-virus softwares.

Challenges:

The major challenges faced by librarians in digital library setup are:

- Digitization is an expensive process.
- It is very easy to copy and distribute digital information. Copyright violations do occur in digital environment due to lack of control over content access and reproduction of multiple copies of digital data.

- Technological Obsolescence of software and hardware devices is there.

- Archiving and preservation of electronic information is also a challenging task. Digital storage Medias such as hard disks and tapes has very short life span.

- Pricing of digital information is also a complex process.

Conclusion:

With the advent of new technologies the setup of libraries and role of librarians as custodial of information resources has changed a lot. Change is the basic natural phenomenon. Librarians need to improve their skills according to the evolving needs. The newly acquired skills will help in developing and managing digital libraries. The empowerment of library and information professional with ICT skills is all that is required for successful functioning of digital libraries. The digital environment has brought a tremendous change in the way information is stored and accessed. This has influenced the working of libraries and has brought a lot of changes in services provided by the librarians. They are evolving as successful information professionals and leaders in adopting the change for the user satisfaction.

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Mobile Learning and Academic Libraries: New Genre of Services for the Users

Sanjeev Kumar[*]
Dr. Arti Sharama[**]

Abstract :

Mobile devices especially the smartphones have become a key tool for everyone in the information society. Mobile learning is picking up especially among the youth. The influence of mobile technology is such that there is blurring lines between formal and informal teaching. The importance of e-learning has been realized more with outbreak of Covid-19. Realizing the power of mobile communication technologies information commons a physical space change is taking place in the libraries. Users are now allowedfor BYOD (Bring Your Own Device) to become active learner. This paper discuss the role of mobile technology in library services and how value added services can be provided through it.

Keywords: Mobile learning, E-learning, Mobile technologies, M-library services

1. Introduction

Education is not only about teachers and teaching but focuses on learners and learning. Internet and related technologies have opened up new possibilities for everyone to learn without the constraints of time and space. E-learning wave is catching up. It refers to the use of

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[*] *Associate Librarian, M S Randhawa Library, Punjab Agricultural University, Ludhiana. E-mail : srishti88@yahoo.com*
[**] *Assistant Librarian, M S Randhawa Library, Punjab Agricultural University, Ludhiana. Email:lib-reference12@pau.edu*

internet technologies to deliver broad array of solutions that enhance knowledge and performance. E-learning has been implemented in the field of education. Smart classrooms with internet and multimedia facilities have made the education more interactive than ever before. The importance of e-learning has been realized more with outbreak of Covid-19 as all the students of educational institutions whether schools, colleges or universities have been compelled to remain at home. Under such prevailing conditions technology has become savior for the learners and interaction is possible the online learning environment through the use of technology. Though in no way traditional education can be replaced but technological advancements and unprecedented situations calls for everyone to be equipped with basic knowledge of technology as well as medium to reach a particular goal.

2. Mobile Technologies and Libraries:

Wide variety of information is available on the internet and information seekers can obtain the relevant information through various search and discovery tools. Academic libraries being the hub of intellectual activity continuously adapt to changing environment by applying appropriate technologies to support e-learning. They provide seamless access to electronic resources such as online catalogues, online books, online journals, databases, institutional repositories, preprints archives etc. Proliferation of wide variety of documents in electronic form has resulted in development of courseware which enables students to have access to resources from web space. Further many open educational resources are freely available so that user can use and reuse for teaching, learning and research. The users desire to have access to all information from single point which every library can provide through its web portal. A digital or virtual reference service through e-mail and real time chat messaging is new way of answering the users' queries. Libraries are in a position to reach out to their users and communicate with them by making use of web 2.0 tools

such as blogs, facebook, Flickr, YouTube etc. Library can make the users aware about its services through social networking and make efforts to feel the presence of itself especially among the youth. There is sea change in the growth of telecommunications which has aroused user's desire to use a number of different communication medium to access internet. The mode of computing has shifted from desktop computers to laptops and from laptops further to tablets/mobiles. Rapid developments in information communication technologies have helped the people to access information and process transactions through the use of mobile phones. The unprecedented growth of mobile technologies especially 3G, 4G hype and Wi-Fi innovations, hotspots etc. have resulted in change of tools to access to internet. Mobile devices especially the smartphones have become a key tool for everyone in the information society. Nowadays mobile phone is not only used for calling but comes with lots of application and functions. With the advancement in mobile technology and easy availability people now want to be connected wherever they are. Mobile phones have changed the way we live and work. People are becoming more dependent on wireless technology system because of its ease and access. This fast growing technology has captured the imagination of educational institutions and provided the necessary impetus to research and development.

Mobile learning has redefined the role of teachers and students. Mobile technologies has made possible the convergence of teachers, students, classrooms, and information sources to single mode of access thus has provided unenviable power of learning. The impact of mobile technology is such that there is blurring lines between formal and informal teaching. The virtual presence is being felt through the use of mobile technologies. The real impetus to wider use of mobile in the academic institutions was felt with the application of web 2.0 technologies as it involves active participation of the users. Today's users have been widely using mobile devices such as tablet, e-readers , smartphones as their primary tool to access the information. They

can access multiple applications such as email, internet, whatsapp, facebook, video calling. Since libraries play an integral role in information society also striving hard to make use of this technology to provide innovative services to their partons. Users of the library are attracted towards social networking sites and are more interesting in accessing online resources. Mobile phones are easy to carry and are becoming the first choice among youngsters to be used for study and quick learning. International Telecommunication Union (ITU) predicted that web access from mobile will exceed access from desktop computers in next five years (Ayyanar & Arunkumarn.d). Moreover the information commons, a physical space change is taking place in the libraries. The information commons play special role by providing access to technology and perhaps encourageto have a less "isolating" experience for the students outside the class. Earlier mobile library refers to use of vehicles like vans that provided services in the villages where there was no library or where it was difficult to access public libraries(Vassilakaki, 2014).

Technological developments has made possible to access the library on mobile devices in such a way such that now slogan "Libraries on wheels" to "Libraries in hands" is picking up all around. Now "mobile" refers to activities and services using mobile technologies. Mobile technology is developed for communication and mobile devices are combination of hardware, software, networking and operating system. Various mobile devices like personal digital assistant (PDA), i-pads, cellphones/smartphones etc. are being used for various purposes. Mobile devices can run complex software, play multimedia content, interact with cloud services and allow interaction of the user. Bluetooth, touch screen, wi-fi, Global positioning system ,various media creation and capturing tools etc. all are part of mobile environment. It offers the modern way to support learning process through the use of mobile devices such as tablets, i-pads, smartphones/cellphones/ etc.Mobile devices helps the users to stay connected not only to data and resources but also with each other.

Mobile phones are gaining popularity especially among the youth. They want to access whatever information through the use of mobile phone. It is just-in-time learning as the information can be delivered anywhere and at any time through it. Libraries can optimize potentiality of smart phones in order to provide value added services to their users.

2.1 Mobile learning or M-learning refers to "any sort of learning that happens when the learner is not at a fixed, predetermined location or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies". In other words learner can learn anywhere, anytime with the use of mobile devices. Mobile technologies are attractive and use can have constant access to information through it. With easy affordability and wider internet accessibility options mobile phones hold great potential for reaching out to masses and offer them an opportunity to access information for further learning. With the advancement in the mobile technologies mobile phone are not just used for calling but for number of other applications such as email, video chat, video calling etc. People can access information and process transactions via mobile devices at any place when connected with internet. The word M-library started around 2000 at Toyama University Library in Japan. It developed I-mode (information mode) services for bibliographic searching (Techataweewan, 2017). People want to stay updated which lead to in development of various "Apps".

2.1.1 Mobile App and Library: The first contact point for any user is library website so the obvious choice for any library to initiate its mobile presence is through its website. Mobile browsing for library websites have become better with advancement of technology. With little tweaking of library websites coding an effective mobile based website can be created (Griffey, 2010). Mobile App is a computer program or software application designed to run on mobile device such as smartphones or tablets. Apps were originally intended for

general productivity information assistance such as email and calendar but later expanded to other areas. Now a days millions of apps are available. Usage of mobile apps has become prevalent among the mobile users (Wikipedia). Libraries are also working hard to develop mobile web sites for their patron to provide personalized service to their users. Mobile Apps can potentially help the library users by providing access to plethora of information such as OPAC, Electronic resources, databases, library news and other multimedia content. Library aap allows users to access library hours, view their library account and other library related information. Thus users can be informed in much better way through the use of this push technology. Important Information regarding special events, topics etc. can be brought to the user's attention through library app. Though most of the libraries are providing state of the art services to their users through computers and related technologies but with regard to mobile application it is still in developing. Libraries are slowly moving towards providing mobile based services.

2.1.1.1 Prerequisite for mobile learning in library settings: While planning and implementing mobile learning following things should be kept in mind

➢ Library should be automated i.e. Library management system should be used to track library documents and patron details like items owned, order made or users borrowing details etc.

➢ All the modules like acquisition, cataloguing, circulation, serials management should be functional.

➢ Library and associated area must be properly connected along with Wi-fi facility and server for providing uninterrupted access to library services

➢ Electronic information service delivery, Digital information base

➢ Security and authentication issues are matter of concern to prevent loss of data and information.

*2.1.1.2.Tools for mobile learning :*There are number of tools which make easy for mobile learning (Pandey, Gupta &Shrivastava, 2017).

(i) *Content management system :* Content is the most important for the user and it is utmost important for any library to organize the content using content management system in such a way that user can easily understand it. Many content management systems are available free and in open source. This tool helps in easy creation and management of learning content in the virtual environment

(ii) *Blog :* It is another way of publishing and organizing the content which can be accessible online. It is an online diary consisting of discrete entries. It is managed by individual/Group of individuals/Institution to disseminate the relevant information quickly to the user group.

(iii) *Email :*It is an electronic transmission of messages over communication network . Messages and information is shared through email from one mobile user to one or mor recipients.

(iv) *Online discussion/Whatsaap :* t is relatively a new form of communication facilitated by mobile networks. Mobile learner can chat with fellow students or teacher on area of interest. It is quickest and most widely used platform for information sharing and exchange over mobile network. Many people at one time can exchange information, files, multimedia content etc. through the use of mobile phones

3. Mobile Technology and Library service:

Libraries can provide number of value added services to their users. The basic m-services of academic libraries are mobile OPAC, online databases, loan enquiring and notifications, online reference services and library information (Bishop, 2012, Li, 2013, Kumar ,2014). Book

location application use scan technologies like OCR and QR code to identify the book location missing or misplaced etc.

*3.1 MOPAC :*Online public access catalogue over mobile is available to every user. Libraries are providing access to their OPACs through mobile optimized websites.

3.2 Mobile database: Access to scholarly content through various library databases can be provided over the mobile network so that researcher always feel connected with data and information .

*3.3 New Book list enquiry:*Information on new books can be quickly accessible over the mobile thus user can be quickly informed about the new content.

3.4 Library Instruction: Information related to library rules and regulations can be provided to the user through mobile phones.

*3.5 Short message reference:*Online chat and text messages through messenger and the request box can be exchanged instantaneously. Patrons are able to chat and ask questions. Services like new Book suggestions, Book reservation , due date reminders etc. can be provided quickly.

4. **Advantages of Mobile learning:**

   - Personalized service : feeling of personalized service

   - Time saving: User time can be saved through mobile learning. User can have access to service at any point of time

   - Any where learning

   - Multiple collaborations: Simultaneous exchange of information among different users like students, teachers and other stakeholders is possible for powered learning.

   - Learner's active participation: Active participation of the learner in mobile learning motivates the learner. Students

develop their ability and cognitive skills through mobile learning.

5. Challenges of Mobile Learning:

❖ Internet connectivity: Strong Infrastructure facilities along with fast internet connectivity is major issues in mobile learning.

❖ Interoperability issue: Different mobile devices have different operating system and features. So supporting different file formats is challenge.

❖ Bandwidth issues for streaming of content.

6. Conclusion:

Mobile technologies have vast potential to facilitate teaching and learning. Libraries are in way supporting the active learning by making library resources available to everyone. Mobile learning is new hope for the library professionals as it has enormous potential to provide quality services to the users if implemented in proper manner. It is high time for the library professional to take advantage of this technology to instill confidence in the user that they can get the quality information services from the library.

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Importance of Online Learning and Web Tools in Library and Information Science

Anshu Rajbimal[*]

Abstract:

This research is informative in which several important facts related to online learning are discussed. It deals with the importance of online platforms where the libraries are transforming into online libraries. The services of library and way of dissemination have completely changed. Many overviews have come out which shows the modern methods of learning which are based on technology and the rapid growth of online programmes provide a variety of learning opportunities in the epidemic of this COVID-19. It focuses individually online delivery of courses such as SWAYAM, MOOCs where the internet and education concerned with information exchange, communication and the creation of knowledge. It gives the opportunity to reach the target through Webinars, Workshops and Conferences. It also deals with many popular platforms such as Whatsapp, Facebook, Instagram and Twitter where we succeed by adding these services.

Keywords: Online learning, Webinar, Internet, Library and Information Science, Pandemic, Technology,

Introduction:

Education is very important in our life whether we get education by any means. It improves one's knowledge, skills and develops the

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[*] *Student, IGNOU, PATNA*
Email :angelanshu784@gmail.com

personality and attitude. The growth of knowledge and new technology have effected on national development which is influenced by factors such as culture, economy and education. Libraries are important indicators of growth and development because they provide scientific services, fulfil social needs and help individuals flourish. Library and information science programs must recognize the need to change in order to strengthen development. They have created their own techniques and skills which is advancing a lot. In the digital age, ICT has changed the way of human life in every field. It supported education, focusing on the development and designing many education programmes and creating the new way of courses that is online learning.

In today's time, online learning is very important. It is proving to be very effective in the pandemic of COVID-19 that has created a terrible situation all over the world for the last few months. The way this disease is affecting people, it is not at all possible to give traditional education to people. It has influenced the education of all regions of the countries of the world. As social distancing is preeminent at this stage, this will have negative effects on learning opportunities. So, the mode of online learning is essential which is easily accessible, low cost effective and can be reached to rural and remote areas, in the time of crisis. Online learning is being imparted in all disciplines and all areas, but it has given it a new impetus in the area of library and information science and is helping to improve it with new tools to survive in the predicament.

Online Learning

Online learning is a type of education where the learners to get their information with the help of electronically supported learning through the internet. It gives an opportunity to reach learners who may not able to enroll in a traditional classroom courses. It helps to learners according to their schedule to learn in any way or anywhere. It may refer e-learning where the delivery of education and knowledge is

transferred via the internet, which is accessible 24/7, to a large number of learners at the same time or different times. In this type of learning platforms, a learner communicate with the faculty and other learners via e-mail, electronic forums, videoconferencing, chat rooms, bulletin boards, instant messaging and other forms of computer-based interaction. It is a great solution of those people who is doing a job and still wants to further their education. In universities, higher learning institutes as well, large or small, online learning systems are a key component of their education system. For a number of the higher education institutions, a well-established online learning is their lifeline for keeping their class running. It is a great alternative to traditional university, especially for people who can't afford the time and money to take real courses. There are some advantages and disadvantages of online learning as follows.

Advantages

1. Saves time and money
2. Increase convenience and flexibility
3. Fast and easy sharing of resources
4. Learn from wherever and whenever
5. Ability to self-discipline

Disadvantages

1. Possibility of distraction
2. Complicated technology
3. Little or no face-to-face interaction
4. Internet connection problems
5. Lack of practice-based learning

In a survey, there are nine top universities offering free online courses in the world.

1. Harvard University

2. University of California, Irvine

3. Georgia Institute of Technology

4. Ecole Polytechnique

5. Michigan State University

6. California Institute of Arts

7. Hong Kong University of Science And Technology

8. UCL (University of London)

9. Massachusetts Institute Of Technology

There are so many education apps for online learning in the age of digital India.

1. Unacademy

2. Duolingo

3. Udemy

4. Coursera

5. Gradeup

6. CAclubindia

7. Doubtnut

8. Coding Ninjas

9. Sololearn

10. Vedantu

11. Byju's

12. Meritnation

13. myCBSEGuide

14. Vidyakul

15. Toppr

There are many online platforms through which online courses are made available such as MOOCs. NPTEL, mooKIT, IITBX, SWAYAMPRABHA and SWAYAM are the platforms which is used for offering online courses in India. There are many courses in library and information science on all these platforms.

➢ MOOCs - A Massive Open Online Course is a web-based platform which provides unlimited number of students worldwide with a chance of distance education with the best institutes in the world. It provides many opportunities to its learning such as video, lectures, downloading notes, contributing their own and sharing their point of view by communicating with peers, professors and Teaching Assistants (TAs). It was set up in 2008 and became more active in 2012 as a popular learning tool. There are various courses are offered worldwide with the help of MOOCs providers.

- NPTEL (INDIA) Indian Institute of Technology (IITs) and Indian Institute of Science (IISc) offer online courses through this platform which require no registration and are free of cost

- WiziQ (India and USA) IIT Delhi, India offers this course through this platform which requires registration and fees to study courses offered by them.

- Coursera is based out of USA that offers online courses.

- edX (USA) offered online university-level courses which is created by Harvard and MIT.

   Go to: https://www.mooc.org

➢ SWAYAM- SWAYAM is a new portal for MOOCs, stands for Study Webs of Active-Learning for Young Aspiring Minds provides an integrated platform and portal for online courses,

using information and communication technology. This programme was launched by the government of India In 2017 which is designed to achieve the three cardinal principles of education policy i.e. access, equity and quality to all especially to the most disadvantages groups. These programmes are offered by faculties of centrally funded institutions like IITs, IIMs and central universities. Courses delivered through SWAYAM are available free of cost to the learners from 9th class to till post graduate, engineering, law and other professional courses to be accessed by anyone, anywhere at any time. The courses hosted on SWAYAM are in four quadrants :-

- Quadrant –I is e-Tutorial: Video lecture.

- Quadrant-II is e-Content: Specially prepared reading materials that can be downloaded or printed.

- Quadrant-III is a Web Resources: Self assessment tests through test and quizzes.

- Quadrant- IV is Self Assessment: An online discussion forum for clearing the doubts.

  Go to: https://swayam.gov.in

➢ SWAYAMPRABHA- SWAYAMPRABHA is a group of 32 DTH channels devoted to telecast of high-quality educational programmes on 24X7 basis using the GSAT-15 satellite. This programme was launched in 2017 which is designed to provide new content everyday for at least 4 hours which be repeated 5 more times in a day, allowing the students to choose the time of their convenience. These 32 channels are uplinked from BISAG, Gandhinagar. The contents are provided by NPTEL, ITS, UGC, CEC, IGNOU, NCERT and NIOS. The INFLIBNET centre maintains the web portal. These 32 DTH channels covers the following:

- Higher Education:

  Curriculum-based course contents at post-graduate and undergraduate level covers diverse disciplines. All courses would be certified, ready in their detailed offering through SWAYAM.

- School Education (9-12 levels):

  Modules for teacher's training as well as teaching learning aids for children.

- Curriculum-based Courses that can meet the needs of life-long learners of Indian citizens in India and Broad.

- Assist students of (Class 11 and 12) to prepare for competitive exams.

  Go to: https://www.swayamprabha.gov.in

➢ DIKSHA- THE Ministry of HRD has launched National Digital Infrastructure for Teachers portal to equip teachers from class 1 to 12 into the world of e-learning. It is one of a unique app that requires students and teachers to SCAN the QR code available in the book in order to access the prescribed with more than 80,000 e-Books solely created to train and enhance the learning.

Go to: https://diskha.gov.in

ONLINE PLATFORMS FOR LIBRARY AND INFORMATION AND SCIENCE

We are living in the era where individuals are connected by technology. There are new tools available in technology which has given the various platforms. Online learning in library and information science is made possible through technology. There are several e-books from fiction to non-fiction, academic journals, graphic novels, research publications, plays and audio-video digital documents are

available in online library. It helps in providing information to all types of readers.

✔ NMEICT has initiated the National Digital Library of India project to develop a framework of virtual repository of learning resources with a single window search facility through MHRD.

✔ A Digital Library, digital repository or digital is an online database objects that can include text, still images, audio, video, digital documents or other digital media formats.

✔ The World Digital Library is a project of US Library of congress, carried out with the support of the UNESCO and in cooperation with libraries, archives, museum, educational institutions and international organizations from around the world.

❖ **LIS Links**

The LIS links is a virtual community of Indian Library and Information Science (LIS) Professionals. It is the first and largest social networking site in its domain and one of the much popular destination and a huge gathering place. It has brought together more than 27,000+ LIS Professional and different kinds of useful services to them through Email, Facebook, Twitter, Whatsapp and Telegram. Many LIS programmes such as webinars, workshops, online training/courses and conferences are available in LIS portal.

Go to: https://www.lislinks.com

https://www.lisportal.com

There are lots of ways in which online platforms are seamlessly connected with the people of our choice anytime, anywhere in the world. These platforms are being used frequently in the field of library and information science. Today, in the pandemic of

COVID-19, the whole world is completely unable to get out of the house. But with the help of these platforms, we are able to exchange information easily from home. Many such programs are being organised by library and information science in which we are able to communicate information by connecting on a link only. Here are several web tools by which we can create online meetings via internet, which is proving very helpful in advancing the field of library and information science.

❖ WEBINAR

A webinar is an online event where a speaker delivers his or her presentation to a large number of attendees who participate by submitting their questions, responding to polls and using other interactive contents on a single platform. All participants join webinar via their PC, Tablets and Smartphone where they can see video and hear audio from anywhere. The registration forms are very simple for participants to fill in online. It issues e-certificates to all participants via email as a PDF file. Today, many webinars services offer live streaming options or the ability to record webinars and publish to YouTube and other video services. Here are some advantages and disadvantage of webinars.

ADVANTAGES

I. Extreme cost effectiveness

II. A wider audience reach

III. Automated lead generation

IV. More practical skills

V. A more personal connection

DISADVANTAGES

I. Technical issue hit harder

II. Audience gets easily distracted

III. Value depends on purpose

IV. Limited outreach

V. Time-consuming organisation

- How to create a successful webinar to step by step?

  1. Choose a date and time.

  2. Choose your webinar topic.

  3. Customize your branding.

  4. Create a hashtag for your webinar.

  5. Send out your webinar invitations.

  6. Build webinar content.

  7. Do a practice run.

  8. Host your webinar.

  9. Follow up.

  10. Make your webinar recording available

- There are some great webinar platforms on the list.

  1. Demio

  2. WebinarNinja

  3. JetWebinar

  4. ezTalks Webinar

  5. Zoom

  6. GoToWebinar

  7. GetResponse

  8. Skype

  9. ClickMeeting

10. Webinato

11. Livestream

12. WebinarsOnAir

13. GoogleMeet

14. WebexMeeting

● Here are the some examples of recent webinars in library and information science which has been organised by different institutions.

1. INTERNATIONAL WEBINAR on "LIBRARY AND INFORMATION SCIENCE EDUCATION: AN INTERNATIONAL PERPECTIVE" organised by the Department of LIBRARY AND INFORMATION SCIENCE, MAHATMA GANDHI CENTRAL UNIVERSITY, MOTIHARI, BIHAR on 30[th]JULY, 2020 at 03:00 pm onwards.

2. AILL WEBINAR SERIES, 19th JULY, 2020 WEBINAR on "LEGAL EDUCATION PEDAGOGY AND ROLE OF E-LEARNING TOOLS IN POST COVID-19" at 12:00 pm organised by CHANAKYA NATIONAL LAW UNIVERSITY, PATNA in association with ASSOCIATION OF INDIAN LAW LIBRARIES.

3. NATIONAL WEBINAR on "RFID IN LIBRARIES: STANDARDS AND EXPANDING USE" organised by LIBRARY AND INFORMATION SCIENCE PROFESSIONALS ASSOCIATION, ASSAM on 26[th]July, 2020 at 11:00 am to 01:00 pm.

❖ ONLINE WORKSHOPS

An online workshop is a type of course which is available on a digital platform to provide knowledge through info graphics, videos, images

and text. It is a great way for trained professionals to share their knowledge and able to do it remotely means you can reach people all over the world. It is organised usually for 1-day, 2-day or 1-week. It provides e-certificate to participants who successfully complete the courses. There are some advantages and disadvantages of online workshop.

ADVANTAGES

   I.   Convenient and flexibility

  II.   More individual attention

 III.   Financial benefits

 IV.   Connect to the global village

  V.   Real world skills

DISADVANTAGES

   I.   Require good time management skills

  II.   To be an active learner

 III.   Sense of isolation

- The main points to set up your online workshop.

1. Content planning
2. Topic
3. Expertise in the topic
4. Audience
5. Workshop objective
6. Paid or free participation
7. Promoting your workshop
8. Good equipment

9. Recording environment

10. Platform for hosting the workshop

11. Certificate of completion

- There are many online workshops organised by the department of library and information science.

    1. 7 days E-Workshop on "USE OF ICT TOOLS FOR SMART TEACHING" organised by CENTRAL LIBRARY AND IQA, ARYA VIDYAPEETH COLLEGE.

    2. Workshop on "NAAC REVISED ACCREDITATION GUIDELINES 2020" organised by IQAC, GOPICHAND ARYA MAHILA COLLEGE, ABOHAR.

    3. 3 days Online Workshop on "KOHA CERTIFICATION PROGRAMME" organised by MPLA.

❖ **ONLINE CONFERENCE**

Online conference is a type of video conference that takes place on the internet where participants log on and read papers, enter discussions with other delegates and presenters, have live chat and are able to pose questions and interact with people from all over the world.

ADVANTAGES

   I. Cheaper

  II. More convenient

 III. High level of participants

DISADVANTAGES

   I. Decrease in personal contact

  II. Instability in connection

 III. Chance for hacking

- How to host an online conference in 2020?
    1. Paid the best online event platform
    2. Consider additional presentation tools
    3. Select topics and speakers
    4. Create a online conference registration form
    5. Promote the event in best way
    6. Keep the conference secure
    7. Select the background
    8. Increase engagement at online conference
    9. Best way to follow up
    10. Repurpose content into on-demand conference
- Here are the some examples of online conferences in LIS.
    1. 2nd National Online conference on "NCITE-16" organised by Modern Rohini Education Society.
    2. 3rd National conference on "LIBRARY INFORMATION SCIENCE & INFORMATION TECHNOLOGY FOR EDUCATION" organised by Modern Rohini Education Society.

In addition, some famous social networking sites such as Whatsapp, Facebook, Instragram, Twitter, Youtube, and LinkedIn are very important to connect people all over the world. They can be used as an effective way for access information and knowledge for academic purpose. Librarians and information professionals play a very important role in disseminating information. These platforms give more opportunity to reach the target and a chance to interact with library services. These platforms have not only connected the people of library and information science but also have made people aware in this field by adding people from other disciplines.

- Creating own page and group.

- Offering a live option where people from anywhere in the world join together at the same time.

- Informed with different upcoming events and share the information about their new arrivals and editions of study materials.

- Tagging, sharing and uploading picture of library services.

- Highlights new materials, new groups, meetings and many more.

- Create professional connections and to market library services among other library professionals spread all over the world.

- Aware with the latest development in the field of library and information science.

IMPACT OF COVID-19 PANDEMIC IN EDUCATION

The COVID-19 pandemic has affected the education over the last few months. As of 27th July 2020, approximately 1.725 billion learners are currently affected due to school closures in response to the pandemic. According to UNICEF monitoring, 106 countries are currently implementing nationwide closures, impacting about 98.6% of the world's student population in which 48 countries, schools are currently open. It has posed serious challenge to the process of learning to the announcement of a lockdown by several nations. In response to school closure, UNESCO recommended the use of open learning programmes and applications that schools and teachers can use to reach learners remotely and limit the disruption of education. Indian government has also taken cognizance of the untapped potential of online learning. The one-nation-one platform and a dedicated channel for students from Class1 to Class 12 has liberalized online learning regulatory framework. Many online learning platforms

are offering free access to their services, including platforms like BYJU's during COVID-19 pandemic.

This year, as we observe that online learning has become the only means of obtaining information in the field of education in which online library has a huge contribution. Online libraries have offered more and more free content and curating personalised collections that people can continue to read and learn without disruption in this situation. Many libraries are conducting information about COVID-19 pandemic.

Here is a list of free online libraries that may be explored during this critical time.

- Project Gutenberg- It covers 62000 full texts of public domain books in categories like literature, history, science, arts, medicine and many more.

  Go to: https://www.gutenberg.org

- Bibliomania- It has thousands of e-books, poems, articles, short stories and plays by authors likes Charles Dickens, Shakespeare, Edgar Allan Poe, Mark Twain and many more.

  Go to: https://www.bibliomania.com

- Open Library- It has one the best collection of fiction for all ages and plenty of modern titles by authors like Stephen King, JK Rowling, Agatha Christie and more.

  Go to: https://openlibrary.org

- PDF BOOKS WORLD- It has excellent collection of fiction, non-fiction, academic texts and papers which are optimised for personal computers and handheld devices such as tablets and mobiles.

  Go to: https://www.pdfbooksworld.com

- The Online Books Pages- It has listed over 3 millions free books on the web which are in various reader-friendly formats and free for personal and non-commercial use.

  Go to: https://onlinebooks.library.upenn.edu

FUTURE OF ONLINE LEARNING

Online learning is growing very fast all over the world. The pandemic of COVID-19 has brought the critical situation after complete lockdown and affected the global education but online learning is turning out to be the saviour in this crucial time. Many students are attracted to the flexibility of online learning and combine their studies with work or personal commitments. It is not possible for an information provider to host single information of a specific topic locally, but a portal might be the right solution. It has given an opportunity to teach every person in the whole world who wants to learn something. Now a day, most people are considering online learning more effective than classroom teaching. One can make a career by attending the classes of online learning program of a famous college or university. People of lower class are benefiting the most in this. According to data from July 2020, almost 4.57 billion people around the whole world were using the internet. The way the internet is being increasingly used by people for online learning, in that situation the future of online learning seems to be very bright. It will be helpful in maintaining education not only n the circumstances of COVID-19 pandemic but also in all such situations in future. But the most important fact is how we will use online learning as an appropriate resource.

CONCLUSION

Our observation says that traditional learning will always be there but online learning has its own importance. The strength of online learning is having powerful infrastructure and ability to change the whole scenario of learning system during the COVID-19 pandemic.

At present, there are many online platforms which are playing an important role in making online learning available with ease and speed.

As far as library and information science is concerned, a variety of online portals are available in that subject too. Along with this, different types of web tools are also giving new impetus to this field. The participation of people is seen from every corner of the world. The way, in which we are connecting with these, it can be said in the coming times that library and information science will give a new dimension in the field of education.

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Role Of E-Learning Tools In School Libraries During COVID -19

*Mamta Deshwal**

Abstract

Earlier the school libraries were considered as storehouses and librarians were considered as custodia. Time has changed and libraries played role in the society's development and now in this currant scenario they have transformed in E-Libraries, Digital Libraries and Virtual libraries. Various tech tools ,digital platforms are playing a vital role in the development of 21st century libraries.

Keywords: School Library, COVID 19, e-learning, Digital Library, Virtual Library, Resource Sharing.

School Library: An Introduction

"The school library provides information and ideas that are fundamental to functioning successfully in today's information and knowledge-based society. The school library equips students with life-long learning skills and develops the imagination, enabling them to live as responsible citizens."

School Library Manifesto

School Libraries in COVID 19

Before COVID 19 all school libraries were playing its role prodigiously. Earlier the main focus was on the physical books, library record maintaining, circulation etc. They work hard to create a

* Librarian, Delhi Public School, Greater Faridabad
E-mail : mamtadeshwal1980@gmail.com

beautiful, welcoming, comfortable space for their students. Due to this lockdown library is closed, books are waiting for its users. But school librarians cannot resist themselves so they also come forward to guide and encourage students. These days students cannot reach to the books or libraries but libraries can reach to them. With this thought, they start working on creating e-Reading corners for them on digital platform. There are lots of digital platforms to connect with them. There are various tools which are very famous and very user friendly.

Tools to Connect School Libraries and Its Readers

1. Google Classroom

Google Classroom is a tool for students and teachers to organize their assignments, enhance collaboration, and build better communication among each other. This is a wonderful tool to collaborate with teachers and students. There are end numbers of activities which school library can organize and get connected with the students. For example they can make e-reader's club on this platform and organize the activities like book of the week, author of the week, assign quizzes on books, book reviews, book cover competitions and many more. Students of 21st century are just made for technology and they really like these types of activities on digital platform.

2. Microsoft Team

Microsoft Teams Education is a go-to communication hub. It keeps our work organized and help us to connected. It manages our students' assignments, quizzes, book reviews on one platform . We can easily access it from a mobile app or even on the web. This means no matter where we are, if we have an internet connection, we can easily connect with our students. Various library activities can be conducted through this tool .

3. Padlet

Padlet is a great place for gathering ideas, sharing them. It's like a living, breathing webpage for everyone. We can add links, YouTube videos, files and images for our readers. It's a wonderful tool for senior readers as they express their views about any book on this .We can share our recommandations,summer reading list and book reviews on it .It is a very easy and attractive tool.

4. Wordpress
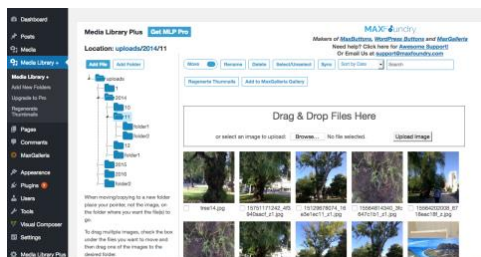
This is a wonderful tool on which we can create a beautiful website or, blog. This is a free tool . On WordPress anyone can make their

school library website or blog and post the useful links, documents and activities related to their school library. Students can participate in various activities and can post their views .Library blogs are getting very popular these days.

5. Telegram

This is an online messaging app which works like popular messaging apps e.g.WhatsApp and Facebook Messenger. It's very easy to download and create channel on it.After creating the channel we can invite our students and teachers .A easy platform to connect and share information ,documents, latest updates ,articles.

E –Learning Portals-Boon for School Students

These days there are many organizations which are providing lots of study material to school students. It's very important to take care school students in this pandemic time. These days school students are locked in their houses, in this situation it is very important to provide the quality study material, free e -books, online courses. There are various online platforms which are playing tremendous role . School libraries are playing an important role between the students and these platforms. They are helping school children to reach out to these digital platforms. Some important platforms are-

1. National Digital Library Of India (NDLI)

NDLI is now open to all the students to enable study at home. It provide free of cost study material to the school students which is very useful for them. In this time of COVID-19 to take care of their academic life this initiative has been taken.

NDLI @ Corona Outbreak

To help the students to continue their studies in COVID-19 pandemic this special feature has been introduced in which students will get Video Lectures, JEE Preparation Materials, Activity, Self Assessments and various Study Materials, Books from CBSE, NCERT and Other State Boards. Preparation and study materials for aspirants of engineering, science, law, language, management, law, and other disciplines is available .
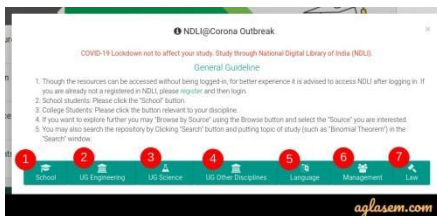
2. National Repository Of Open Educational Resources (Nroer)

NROER is a collaborative platform, which brings the school and teacher community together. It is initiated by the NCERT.

3. Diksha Portal
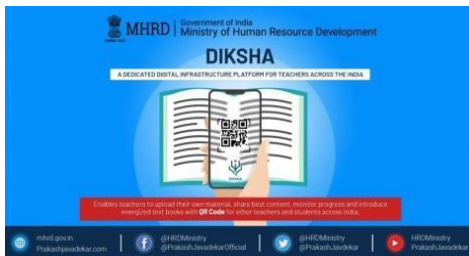
Diksha portal provides various learning material to students, teachers and parents which is relevant to the prescribed school curriculum. **Students** can understand concepts, revise their lessons and can do practice on it.

Study at Home through DIKSHA portal –as we know that it is the tough time when the students are not attending their schools and missing their studies. Ministry of Human Resource Development (MHRD) in association with National Council for Teacher Education (NCTE) have initiate this special programme in the domain of e-learning. The main purpose of this initiative is to help teachers and the students at home . It has the list of various e-learning programme for all the students.

4. Swayam

This programme is initiated by Government of India. The main objective of this programme is to provide the best teaching -learning resources for all. The courses hosted in 4 quadrants – (1) video lecture, (2) specially prepared reading material that can be downloaded or printed (3) self-assessment tests via tests and quizzes (4) an online discussion forum for clearing the doubts of the teachers and students.

5. Swayamprabha
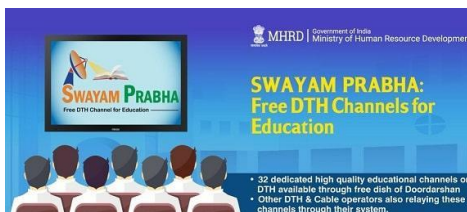
It provide 32 DTH channels which telecast the high-quality educational programmes on 24X7 basis using the GSAT-15 satellite. Daily new content for 4 hours is telecasted which is repeated 5 times in a day, this give opportunity to the students to choose the time as per their convenience. Students (class 11th & 12th) are getting help in preparation for their competitive exams. At this pandemic time this is very useful platform for students.

Important And Useful Websites And Links For School Students

1. For Audio Books.

● https://stories.audible.com

● https://youtu.be/uqvuIbjtvnE

2.SOME RESOURCES FOR USE DURING THE LOCKDOWN

● The New York Public Library – you can now download over 300,000 books for free https://reurl.cc/lV06jv

● IDFA International Documentary Film Festival Amsterdam online – free resources https://reurl.cc/d0VZjq

● Virtual Museum Tours, Graffiti Tours, nature walk https://reurl.cc/j7q0j2

● 4. Verso Books – free E-books https://reurl.cc/qdmeAD

● Over 50,000 free coloring pages for kids http://www.supercoloring.com/sections/coloring-page

● The Top 100 Documentaries We Can Use to Change the World https://reurl.cc/lV061d

● NASA's online activities, e-books, podcasts and other content. https://www.nasa.gov/

Activities

- Pschool.in

  FOR FREE E BOOKS

- http://gutenberg.net.au/ebooks

- http://www.goanwap.com/ebook-bly-list-0.html

- https://www.44books.com/free-hindi-books

Stories World

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- https://go.onelink.me/zxCw/f5ac8dc2

Digital Libraries

- https://ndl.iitkgp.ac.in/

- http://en.childrenslibrary.org/

- https://www.wdl.org/en/

Suggestions

- There should be one common platform for all school libraries, where they can get e-books of fiction, non-fiction and reference books for all level of students.

- As school students are too young to explore the digital platform and not able to find the age appropriate material for them .There should be some websites who can allowed us to share the pdf study material to the students.

- To keep students engage in their reading habits during this global pandemic school librarian may send them weekly reading challenges.

- Every week one bestseller book can be highlighted and quiz may be organized on that book.

- Students can be encouraged in order to write their own stories using online tools such as Google Docs or Microsoft PPts, Digital Journal and then they may be buoyant to share them in e- library-classrooms.

Conclusions

This pandemic time has taught us new lessons of life. We learn to use technology in proper sense. The technology has bring us together and with the collaborative efforts we can achieve our goals. Digital India initiative is playing an important role in this by its great initiatives like NDLI, Diksha, Swayam, Swayamprabha etc. The tech tools like Wordpress, Google classroom, Microsoft Channel, Padlet, telegram etc are playing a vital role These platform are creating connections between the students, resources and school librarian. The e -world is full of wonders, we just need to explore and adopted it wholeheartedly .I hope very soon this lockdown will end, our libraries will again rejoice with its readers.

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- https://nroer.gov.in/
- https://www.swayamprabha.gov.in/
- https://swayam.gov.in/
- https://wordpress.org/
- https://www.microsoft.com/
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Artificial Intelligence Applications in Education

*Soujanya Muthyala**

Abstract:

Artificial intelligence is the much-acclaimed technology that is used to perform day-to-day tasks. Yet discourse of what this implies for current and emerging times, specifically with regards to the drastic changes that AI could bring to the education sector has barely even started. This article initially combs the present context of the advancement and utilization of artificial intelligence, tries to infer the effect on the education sector at the comprehensive and tenuous view over the application and development trend of artificial intelligence technology in practice. One topic that requires thorough emphasis is the significance of AI for education. This paper includes a fine-grained and detailed scrutiny of various AI technologies that create beneficial effects on education fraternity.

Keywords: Artificial Intelligence, Education, Technology, Learning.

Introduction:

According to Market Research Report in 2018, the global AI in education market is estimated to attain $3.68 billion by 2023. Artificial Intelligence also referred to as machine intelligence is a branch of computer science that deals with the simulation of intelligent behaviour in computers and is capable of imitating human intellect. It has stepped into almost every sector in the modern era.

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* B.B.A, L.L.B (Hons)
Gitam School of Law, Visakhapatnam, Andhra Pradesh
soujanya.acads2001@gmail.com

From automated self-driving vehicles to personal assistants like Siri, AI has been creating wonders. Educational institutions with an aim to facilitate enhanced learning are now striving to incorporate AI technology. Both the students and the teachers can achieve the best attainable outcomes through AI services. It provides a high level of education along with personalized and quality services. Although computers are widely used for storing student information, they now act as instructional and learning resources.

Intelligent Computer-Assisted Instruction (ICAI) System

The application of artificial intelligence methods to (CAI) computer-assisted instruction is known as the ICAI system.[1] The problem-solving expertise module in the system includes information about a specific subject or facts concerning problem-solving skills or methods pertinent to a certain domain. The system uses this proficient knowledge to create suitable questions and to assess the pupil's answers. The following are some of the ICAI systems:

a) *SCHOLAR*: It is the foremost and renowned ICAI system that was developed to educate the geography of South America. It manipulates its knowledge base to generate factual questions, to evaluate the student's answers, and to answer the student's questions.[2]

b) *SOPHIE*: Instead of instructing the learner on the topic of electronics, it facilitates the pupil with a learning atmosphere to gain problem-solving skills by testing his ideas. SOPHIE is a

1. Jay Liebowitz, Intelligent computer-aided instruction for training in telecommunications, 5Telematics and Informatics, 53-6 (1988), https://www.sciencedirect.com/science/article/abs/pii/S073658538880008X#:~:text=Intelligent%20computer%2Daided%20instruction%20(ICAI,by%20conventional%20computer%2Dassisted%20instruction.
2. Marlene Jones, Applications of Artificial Intelligence within Education, 11 Computers & Mathematics with Applications, 517-526 (1985), https://www.sciencedirect.com/science/article/pii/0898122185900549.

computerised specialist that assists the student to formulate, examine, and rectify suitable hypotheses.[3]

c) *BUGGY*: The arithmetic mistakes or errors of a student can be determined through this ICAI system. Simply put, it is capable of anticipating a user's answer when a new problem is put forward. It has been successfully applied within the usual classrooms and has been utilized for over a thousand students.[4]

Learning through Hyper-personalization

The technology that is applied in Netflix to provide individualized recommendations is also used in the education sector. The learning rate and ability of every individual are unique and different from others. Few are proficient at "left brain" thinking with skills for analytical thought, while others are more skilled at "right brain" thinking with creative, literary, and communicative abilities.[5]

A single teacher cannot design an academic curriculum separately for each student. However, AI with the usage of Machine Learning algorithms makes it possible to customize and develop personalized learning profiles for each student on the basis of their understanding and capabilities. For instance-

a) *Century Tech*: This platform uses a specific type of AI engine that tracks every interaction for each student identifying their specific needs and preferences. It creates a constantly adapting

3. J. S. Brown, R. R. Burton and A. G. Bell, SOPHIE: A Sophisticated Instructional Environment for Teaching Electronic Troubleshooting (An Example of AI in CAI). Bolt, Beranek and Newman, Inc., Report 2790 (1974).
4. J. S. Brown and R. R. Burton, Diagnosing bugs in a simple procedural skill, in Intelligent Tutoring Systems, Academic Press, 157-183 (1982).
5. Ron Schmelzer, AI Applications in Education, Forbes, (Jul.12, 2019), https://www.forbes.com/sites/cognitiveworld/2019/07/12/ai-applications-in-education/#2b946f5462a3.

recommended path that provides each learner with tailored content that helps them progress.

b) *Carnegie Learning*: The "Gold Standard" study conducted by the U.S. Department of Education and the RAND Corporation states that there has been a twofold increase in the performance of students in the second-year implementation of Carnegie Learning.[6] It uses MATHia software that provides 1:1 personalised maths coaching for middle and high school students.

Digital Content

AI technology supplements in transforming conventional large textbooks into smaller study materials, summaries of lessons, flashcards, including short smart notes for enhanced comprehension. Digital content also entails video conferencing, explanatory videos and video lectures to ease the learning process of students. For example-

a) *Knewton*: This platform uses adaptive technology to identify the knowledge gap of every student and provides them seamless remedy. It also uses Alta software to facilitate learners with the necessary instructional content.

b) *Blippar*: It integrates augmented reality (AR) and artificial intelligence (AI) to improve classroom-learning for students.[7] They facilitate learners with interactive materials including virtual 3-D models for better understanding of concepts.

6. Carnegie Learning, The RAND Study,(Aug.
2017)https://cdn.carnegielearning.com/assets/page-images/RAND-Study-
Flyer.pdf.
7. Alyssa Schroer, 12 Companies using AI in Education to enhance the classroom,
Builtin, (Mar. 25, 2020), https://builtin.com/artificial-intelligence/ai-in-education.

It is estimated that the AI activated online education tools will peak over $6 Billion in commercial scale by 2024.[8]Anytime soon the digital content may replace the printed versions of textbooks.

Using Voice Assistants

The well-known virtual or voice assistants like Microsoft Cortona, Apple Siri, Amazon Alexa and Google Home that are commonly used at households are now utilized to enable learners tointeract with study guides in the absence of teachers. Along with the customary handbooks and orientation materials, Arizona State University (ASU) is also giving some of their incoming students an Amazon Alexa device preloaded with ASU-specific skills.[9]

The following platforms provide digital learning services using voice assistants:

a) *Nuance*: Its Dragon Speech Recognition software can transcribe up to 160 words every minute and is specifically beneficial for physically challenged students and those with writing difficulty. As a result, it improves grammar and speech recognition. Using the software, lectures can also be dictated by the educators for future reference or foster tire some work such as creating emails and documentation.

b) *Cognii*: Its virtual learning assistant can automatically assess student's open-response answers while providing conversational

8. PRNewswire, World Artificial Intelligence (AI) Market to Reach $71 Billion by 2024 - Majorly Driven by the Growing Adoption of Cloud-Based Technology, (Jul. 2, 2019), https://www.prnewswire.com/news-releases/world-artificial-intelligence-ai-market-to-reach-71-billion-by-2024---majorly-driven-by-the-growing-adoption-of-cloud-based-technology-300879339.html.
9. Cognilytica, AI Today Podcast #052: AI on the Campus — Interview with John Rome, Arizona State University (Aug. 29, 2018), https://www.cognilytica.com/2018/08/29/ai-today-podcast-052-ai-on-the-campus-interview-with-john-rome-arizona-state-university/.

tutoring experience. It structures the sequence of questions based on student's needs and gives them immediate feedback.

The usage of these virtual assistants fosters the engagement and enthusiasm of students in the academic curriculum. In addition to answering general campus-related questions, they also customize by following every pupil's specific schedule and courses. As a result, it declines the necessity of internal support along with the expense of printing extravagant college handbooks which can soon get outdated.

Assistance in Administrative Functions

Teachers more often spend a great deal of time performing administrative functions like the assessment of essays, assignments, evaluation of exams, maintaining the educational environment, preparing study materials, keeping a record of daily attendance, planning excursions, addressing parents, doing essential paperwork, etc. AI technology can be used to govern these non-teaching tasks wherefore educators can save a considerable amount of time.

Moreover, AI-powered services can also facilitate educational institutions with smooth and easy-going admission processes. They also assist in jobs such as maintaining student details, syllabus management, HR-related issues, and finance management.[10]It paves the way to unbiased admissions by eliminating human prejudice.

Efficient Feedback and Response System

Research suggests that quick feedback is one of the main elements of effective tutoring.[11] Several AI-backed applications and systems assist

10. Usm systems,AI In Education: Top 12 AI Applications in Education Industry,(Jan. 9, 2020), https://www.usmsystems.com/top-ai-applications-in-education-industry/.
11. Alyssa Johnson, 5 Ways AI Is Changing The Education Industry, eLearning Industry, (Feb. 6, 2019)https://elearningindustry.com/ai-is-changing-the-education-industry-5-ways.

the pupils in obtaining quick and tailored responses along with clarifying their doubts from Professors.

Machine Learning apps such as project essay grade (PEG) writing, Grammarly and Turnitin are created to facilitate learners with automated grade and feedback on the basis of their essays.AI systems also have an online interactive interface which aids in feedback from the pupils to their professors for follow up purposes in areas where they might be struggling or have not yet fully grasped.[12]

Conclusion

Artificial intelligence and machine learning will be a fundamental component of all the academic activities in the near future. However, AI can never replace the role of a teacher in the learning process of students, rather it helps them to complete various tasks. They just act as a supplementary part to assist learners for better understanding of concepts. In the prevailing situation, most of the schools and colleges in India lack the basic required technology to educate the pupils. All the educational institutions at home and abroad must adopt AI technology to achieve tremendous success both for them and the country. Hence, the AI- enabled education services with their countless benefits would lead every student to a fruitful future.

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12. Ron Schmelzer, supra note 5.

Changing Scenario of Content Management System with Web 1.0 to Web 3.0: Types and Features

Sumit Gupta[*]

Abstract

In this pandemic situation of COVID-19, global market changes, demand for upgraded trends, researches & development, mergers and acquisitions become more crucial for CMS. A resource person can only deliver globally if they will get strong platform in which they are going to work. As there are a lot of numbers of CMS in market to develop their content so there is a dilemma of choosing an efficient CMS. This paper will describe the changing scenario of content management system from its emergence to current era and also suggest to choose the authentic application. We have compared and analyzed the performance among well-known CMS. What CMS can do, types, features and advantage of CMS will be discussed in brief format.As the demand for Open-source Content Management System market increases globally the market has also been registering good growth curve which is expected to last through and beyond the forecast suggested.

General Terms- Open source Content Management System.

Keywords- CMS, Drupal, Joomla, WordPress, CMS Comparison

* *Student (M.Lib. I.Sc), Jiwaji University, Gwalior*
Mail id- guptasumit8485@gmail.com
Mob No. - 8564938485

Introduction

Content management system basically a storehouse of content. It is a computer application that supports the creation and modification of digital content. Whenever we talk about CMS, we must have an idea about the content. Content is all about information or knowledge for the consumption of end users. Content is created through changing or editorial process. Editorial process may be the changing data, deleting some part, adding or summing up of new information etc. Content may be text, audio, video, audio-visual, documents, images or anything else which could be useful for human. CMS are developed in 1990's.

Web 1.0

In 90's, with the introduction of Web 1.0, the advent of CMS has started. Web 1.0 was introduced by Tim Berners Lee. Static HTML was also devised by the Tim Berners Lee. Static HTML were those pages in internet which are unvarying in nature. In web 1.0 there are almost 1, 00,000 websites and 50, 00,000 users are using them. HTML were emerged from the Standard Generalized Markup Language (SGML) which was developed by IBM. In late 1993, Mosaic Browsers were developed for supporting the text along with images in separated format. SSI (Server Slide Include) was used for managing web content first time in 1990. By SSI you can keep main site separated from the other content which we are going to use. Different parts of home page can be secluded one by one like title, right bottom, right upper, left middle etc. CGI (Common Gateway Interface) was introduced first time by for make you web more fanciful or designed.

Web 2.0

Web 2.0 was introduced by Darcy DiNucci in 1999 and later it was popularized by Tim O'Reilly in late 2004. It was using by 100 cr. Users and almost 10 cr. websites were used. It was like for create and share purpose whatever was developed by the creator for end-users. It

describes the variety of web pages and applications. Purpose of Web 1.0 was only for creation and share in a minimal basis but Web 2.0 was established for user generated content like users can generate or create data, may edit this or share this on global level.

Web 3.0

Web 3.0 is introduced in internet market which is called as the evolution of internet. Where web 1.0 was based on read or static, web 2.0 was based on read and write, web 3.0 was rooted on read, write and share& execute. Almost 100 cr. Websites are running in this time and the counting figure of users are over 250 cr. With the advent of share alike property, content explosion problem arrive. Web 3.0 maintains all this problem of abundant of information in a structured manner in a dynamic way and provide supports to web content to publish more data and delivering it to end users. Web 3.0 can be said mobile web because of the use of mobile based internet. These changes can be seen drastically as in recent time many surveys and reports have proven this that mobile is being more used then desktop. As users are demanding content in mobile or tablet form CMS developers have to change their strategies as per users to deliver content in mobile or tablet web form. We are living in the mobile era have seen a growth in use of communication channels including IOT devices like digital assistants and virtual reality.

Traditional vs. Modern CMS

Traditional CMS were built for the websites that they gave us the freedom to change the interface templates in custom code in a single environment but this is no longer enough. Today content can be displayed on any devices and in any format. Traditional CMS are not able to comply with all of these. So we need a new breed of CMS that's why headless CMS comes in. Headless CMS is free from any channels so it could be displayed on any channels through application programming interface. By headless CMS you can write your website in any language and publish it with the help of API on any channel.

Traditional CMS can be changed into headless CMS by just adding API feature. Headless CMSalso provide better security to website.

Here is an image which will provide the gist of changing pattern:
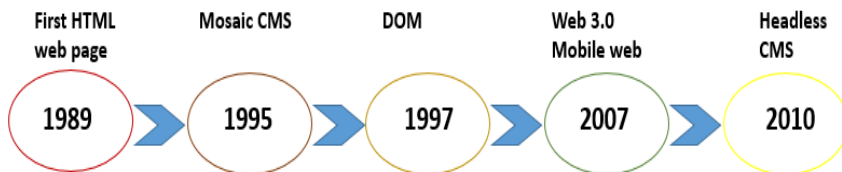
Types of CMS

There are different types of CMS which are evolved during last two decades. With the advent of simple CMS a path was paved for these types. Six types are described below. Let's take a look.

1. **Web content management system-** delivering of content in mass is possible only because of WCM. WCM lets users to manage websites and digital components. A proper and prior web programming or mark-up language is not necessary for web content.

2. **Enterprise management system-** enterprise content generally are not for masses. They are only useful for enterprise purpose. It collects, organizes preserves and deliver the content to organization, association, institution or enterprise. ECM records content of staff, employee, officers, customers, brokers etc. ECM provide the access of content to all of its member in fingertip mode and provide security also.

3. **Document management system-** DMS is used for recording content without paper or files.

4. **Digital asset management system-** DAM is content management technique in which digital content i.e. images, video, audio,

documents, records, audio-visual, graphics, sound etc. management and manipulation is possible with DAM.

5. **Records management system-**In RMS is those kind of content is managed which is created as a by-product of any content.

6. **Components content management system-** CCMS is different from the simple CMS as CMS contain all data in mass form whereas CCMS collect content as smallest or granular form.

A tremendous growth was seen during last two decades in CMS industry. A lot of CMS software were using by different institutions, enterprises, companies etc. but there is dilemma in choosing of authentic CMS so it can be beneficial for masses. Different type of CMS uses different types of programming language and different licensing fee or cost factor may affect the usefulness of CMS.

Mainly two types of CMS are used globally.

1. **Open source CMS**- Open source CMS can be downloaded easily free of cost at initial level. No other fee such as upgradation fee or licensing fee has not be paid whereas these CMS are free at initial level they can charge for assistance service or if we want to work beyond the free offering by authority.

   Ex-

   Joomla Jekyll

   WordPress Drupal

   Ghost   Typo3

   Magneto

   "Free software" is a matter of liberty, not price. To understand the concept, you should think of "free" as in "free speech," not as in "free beer".

   – Free Software Foundation (FSF 2004)

2. **Proprietary CMS-** Proprietary CMS are not free for everyone as they required some installation fee or licensing fee. These CMS developer cannot published source code for mass and public has to purchase its license key from enterprise.

Ex.

✓ Censhare

✓ Contentverse

✓ Episerver

One of the crucial difficulty of choosing CMS arrived because there are numerous open source CMS which provides same facilities and all are free and easy to update. So now the problem is to choose it among these CMS and implement it in organization or association. Joomla, WordPress, Drupal are some important open source CMS.

WordPress- Journey of WordPress was started in 2003 as a blog developer. It is developed by Mike Little and Matt Mullenweg begins. WordPress is most widely used open source CMS used to create attractive website, blog or app. WordPress provide many templates and plugins to improve the attractiveness and usefulness of websites. Other featured extensions can be used by purchasing them. WordPress is licensed under GPL (General public License).

Features of WordPress:

1. Open source and free of cost. 2. Multiple user support. 3. Easily customized webpages. 4. Spam and security proof. 5. Used as Blogging tool. 6. Assembled with standard compliance. 7. Third party plug-ins. 8. a lot of themes. 9. Developed under GPL licensing policy. 10. Maturation is possible after installation.

Joomla- Joomla was released by Mambo in September, 2005. Its most stable version (3.9.14) was released in 17 December, 2019. It is based on model-view-controller web application framework. It is also an open source CMS which is available free of cost. As the source code

are open, users can change the code according to their freedom and according the organization need. Multilingualism in Joomla provides more exhaustiveness.

Features of Joomla:

1. Adaptability in system. 2. Open source application. 3. Breathtaking designing in pages. 4. Globally support from volunteer. 5. Almost 70 translation packs for languages. 6. Advanced search options. 7. Powerful template management. 8.Content, media, user and banner management.

Drupal- Drupal was released in May 2000 by Dries Buytaert. It is open source application created in PHP under GPL license. This is innovative globally used CMS which provide exquisite developing of Web pages. More than 1, 00,000 volunteer, employee are working continuous on this project. Recently Drupal 8.0 version was released.

Features of Drupal:

1. Inclusion of Twig engine. 2. Simple and fast editing. 3. Installation in Multilanguage. 4. Good community and connectivity. 5. Plenty of modules. 6. Highly customizable.

Usage of Content Management system

Market Share of CMS
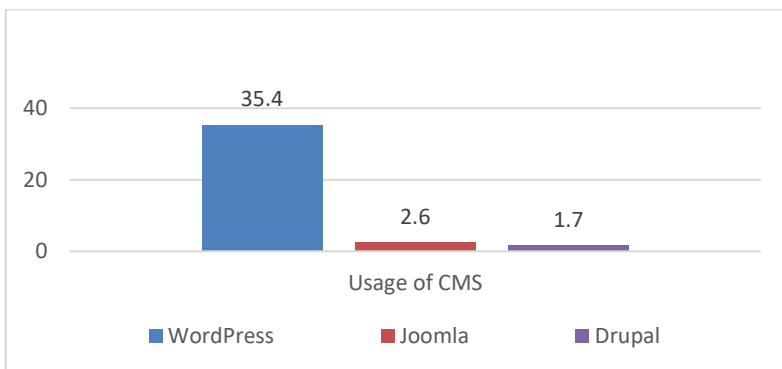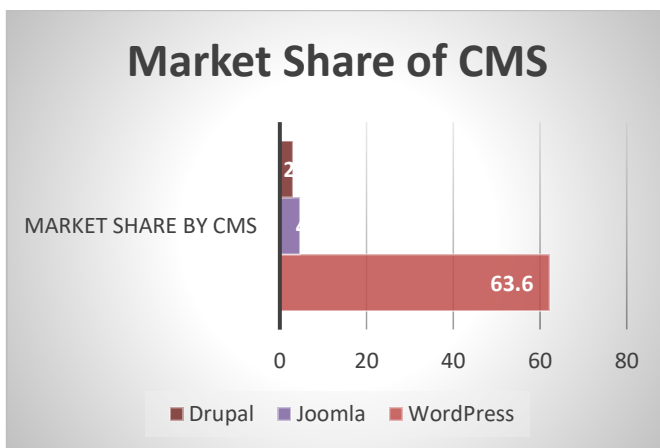
40.8% of the website does not use any content management system.

Historical yearly trend of CMS
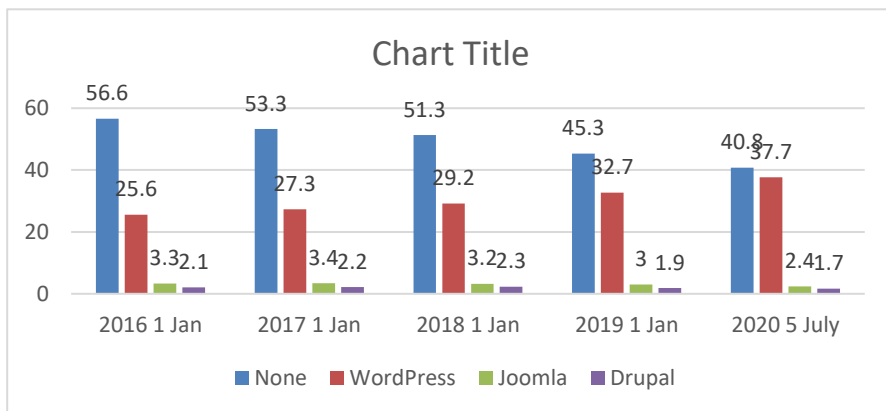
Findings

✓ From the above chart, conclusion can be drawn in the favor of WordPress. Still most of the websites are not working on any CMS. The percentage of websites which were not using any websites in 2011 was 76.1% which is dropped into 40.8%.

- ✓ WordPress has most used CMS in content management Industry. It has risen almost triple times of 2011 usage. In 2011 the usage was 13.1%.

- ✓ Joomla and Drupal have ups and down in their usage. Their usage in 2011 was 2.6% and 1.4% respectively and still the percentage is 2.6% and 1.7%.

- ✓ The web content management market size is expected to grow from USD 6.0 billion in 2020 to USD 13.6 billion by 2025, at a Compound Annual Growth Rate (CAGR) of 17.6% during the forecast period.

- ✓ Shopify is also getting boost in use of CMS as it reached to 2.4% after getting 1.5% hike in a year and passed Joomla in the first week of June 2020.

Conclusion

In COVID pandemic era, Explosion of CMS's have change the scenario of market. We have to use effective CMS to get desirable result in providing services to remote users. As In this pandemic situation no user will be able to reach out resources physically, it is the responsibility of resource center and IAC to provide them according to their need. But in all of these WordPress, Joomla and Drupal have their own value, prestige, utility, and merits. The efficiency and desirability of users was fulfilled by these CMS's. Appraisal from users, enterprises, institutions, have cherished its significance. Now a days users demands an aesthetic, beautiful and effective webpage and his desires are fulfilled with the utilization of CMS. Joomla is best if we are starting to use CMS as it is best for small and with less workload. Drupal is most useful in (w3techs n.d.)web developing and blogging.

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Quarantine Education : Prospects and Challenges of Online Learning among Students Community of J&K UT

*Mubashir Hassan Mir**
*Shyamshree Pal***

Abstract

The study aims to investigate the prospects and challenges of online learning among students community of Jammu & Kashmir based on Quarantine education with the objective to identify the awareness about the online classes, to find out the prospects and challenges of online learning. The rapid evolution of education has drastically changed due to the COVID-19 pandemic, has affected educational systems worldwide shifting the learning from writing on a blackboard to learning from behind a screen. Now the teaching and learning is totally based on educational apps and video conference meeting apps. In such tough times when everything is just a one click away, education apps in India have brought a revolutionary change which has not only helped the students but also the teachers as well where the only motive of all is COVID-19 should not stop learning. It has been revealed from the study that the students of J&K are suffering in this lockdown period mainly due to network problem with 2G speed which being the biggest obstacle in the process of continuing online education in this 21st century. As the current pandemic has thrown open lot of challenges and these challenges are equally true with

* (Library Assistant, Govt. Boys High School, Ganderbal, Jammu & Kashmir, Srinagar, E- Mail id- mirmubashir3@gmail.com)
** (Research Scholar, Department of Library and Information Science, Tripura University, Suryamaninagar, Agartala, E-Mail id- palshyamshree@gmail.com)

regard to continue the education in J&K where they frequently face problems like from no internet to low internet. So, the Government Authorities must look after these issues and fix it so that learning be possible and smooth enough.

Keyword:- *Quarantine, Quarantine education, Online Learning, Jammu and Kashmir, COVID-19, Smart learning.*

Introduction

The rapid evolution of education has faced a drastic change where learning is shifting from writing on a blackboard to learning from behind a screen. With the advancement of the world in the field of technology, we became habituated with the use of technology in our daily life activities such as from booking online tickets or online recharge or making payments, its use and impact on our life has slowly and gradually shifting our learning from traditional based learning to online learning. The internet being the supplier of resources is a repository of huge number of e-books available online which has helped in the accessibility of information, and allowed students to search, browse, read, share materials online from anywhere. (Arkorful & Abaidoo, 2014) It has also made it possible to produce materials for teaching, learning and sharing the coarse material in any platform. Online learning is a term mainly based upon the use of application software, the learning method and proper usage of that application. (Milovanović, 2010) In higher education application of ICTs in the form of e-learning is already changing teaching and learning processes. It allows for efficient transfer of knowledge anywhere anytime, regardless of subject matter, and opens up a world of learning unavailable in most corners of the world. At the same time e-learning empowers learners with the information technology awareness and skills crucial to succeed in today's global knowledge economy.(Aboderin, 2015)

The Corona Virus pandemic, COVID-19 has affected educational systems worldwide, leading to the near-total closures of schools,

universities and colleges. According to UNESCO monitoring, 191 countries have implemented nationwide closures and 5 have implemented local closures, impacting about 98.4 percent of the world's student population. In response to school closures, UNESCO recommended the use of distance learning and various open educational applications and platforms, that can be used to reach learners remotely. The closure of educational institution due to covid-19 pandemic have raised various issues effecting access to education. As of March 12, more than 370 million children and youth are not attending school/college/university because of temporary or indefinite country wide closures of educational institution mandated by governments in an attempt to slow the spread of COVID-19. As of 29 March, 2020 nearly 90% of the world's learners were impacted by closures. Due to the COVID-19 Pandemic, the need of the hour is Quarantine, which restrict the movement of people with an intention it prevent the spread of disease. (*Impact of the 2019–20 coronavirus pandemic on education - Wikipedia*, n.d.) Due to this quarantine the students learning are going to be severely affected and now as a result many school, colleges and universities have shifted to online learning. Despite having many merits and demerits, advantages and disadvantages, it is the only viable option left for student to have continuous access to learning from home which gave birth to the term "QUARANTINE EDUCATION".

This study aims to investigate the prospects and challenges of online learning among school/college/university students of the Union Territory of Jammu & Kashmir. The union territory of J & K consists of two divisions: Jammu Division and Kashmir Division, and is further divided into 20 districts. The education in the Union Territory has suffered the most due to conflict and instability. Due to turmoil and tension the Union Territory has witnessed frequent internet gag and restriction of internet speed. Due to the COVID-19 pandemic everyone is confined to their homes and struggling to continue their learning with 2G speed internet. Unlike rest of the world, the students

of UT struggle with various issues like lack of sufficient ICT resources and poor or no internet services in the context of online learning which has added to their sufferings. The Government of India has taken some initiative to help students of UT in the prevailing situation. The Govt. has started '**Mirchi Master Classes**' for students on air. To make sure the learning is not hampered, the J&K authorities have organized Radio classes in collaboration with All India Radio, AIR for the students who are unable to access online education platform due to closure of poor internet in the UT. The study makes an attempt to discuss the prospects and challenges associated with online learning in the Union Territory of Jammu and Kashmir.

QUARANTINE: It's History

The word quarantine comes from **'quarantena',** *meaning "forty days", used in the 14th–15th-centuries Venetian language and designating the period that all ships were required to be isolated before passengers and crew could go ashore during the Black Death plague epidemic; it followed the trentino, or thirty-day isolation period, first imposed in 1377 in the Republic of Ragusa, Dalmatia.* (Wikipedia, n.d.)

Merriam-Webster Dictionary *gives various meanings to the word quarantine, including "a period of 40 days", "a state of enforced isolation", and as "a restriction on the movement of people and goods which is intended to prevent the spread of disease or pests".*

According to **Cambridge Dictionary**, *quarantine means "*a period of time during which an animal or person that might have a disease is kept away from other people or animals so that the disease cannot spread".

According to **Collins Dictionary**, quarantine is a period of isolation or detention, especially of persons or animals arriving from abroad to prevent the spread of disease usually consisting of the maximum known incubation period of

the suspected disease, or the place or area where such detention is enforced, or any period or state of enforced isolation.

Quarantine may be used interchangeably with cordon sanitaire, and although the terms are related, cordon sanitaire refers to the restriction of movement of people into or out of a defined geographic area, such as a community, in order to prevent an infection from spreading.

The history of quarantine in the ancient period speaks about the seventh century BC isolation occurs in the Biblical book of Leviticus which describes the procedure for separating out infected people to prevent spread of disease under the Mosaic Law. In the medieval Islamic world the Islamic prophet Muhammad advised quarantine: "Those with contagious diseases should be kept away from those who are healthy." Ibn Sina also recommended quarantine for patients with infectious diseases, especially tuberculosis. The mandatory hospital quarantine of special groups of patients, including those with leprosy, started early in Islamic history between 706 and 707. In medieval Europe between 1348 and 1359, a 40-day isolation of ships and people was practiced as a measure of disease prevention related to the plague. In the 21st century, people suspected of carrying infectious diseases have been quarantined, as in the cases of Andrew Speaker (multi-drug-resistant tuberculosis, 2007) and Kaci Hickox (Ebola, 2014). Moving infected patients to isolation wards and home-based self-quarantine of people potentially exposed was the main way the Western African Ebola virus epidemic was ended in 2016. The People's Republic of China has employed mass quarantines – firstly of the city of Wuhan and subsequently of all of Hubei province– in the 2019–20 corona virus pandemic. After few weeks, the Italian government imposed lockdowns in all the country to stop the corona virus pandemic. During the 2019–20 corona virus pandemic, India quarantined itself from the world for a period of one month. (Wikipedia, n.d.)

Impact Of Quarantine On Students Learning

The 2019–2020 Corona Virus pandemic has affected educational systems worldwide, leading to the near-total closures of schools, universities and colleges as a result the students are unable to continue their studies. Various preventive measures and steps have been taken by Government such as social distancing and self isolation keeping in view the virus and to prevent the spread of COVID-19 which has resulted in the worldwide closure of all educational institution.(Impact of the 2019–20 coronavirus pandemic on education - Wikipedia, n.d.) Many countries have successfully slowed the spread of infection through school closures during the 2009 H1N1 Flu pandemic. The closure of the educational institution has in response to the COVID-19 pandemic has put a light on numerous issues affecting access to education, stoppage of all examinations, admissions etc. *In response to the closure of educational institution, UNESCO recommended the use of distance learning programs and open educational applications and platforms that students and teachers can use to reach learners remotely and limit the disruption of education. (Impact of the 2019–20 coronavirus pandemic on education - Wikipedia, n.d.) N*ow as the need of the hour is self isolation, COVID should not stop students learning, the education must continue from home. So, the only measure that can be taken to ensure the continuity of education from home is through online learning i.e. teaching & learning online. (Choudhary, 2016)

The technological development has helped both teaching and learning with the support of technology based classrooms with digital learning tools like computers, laptops, tabs, mobile or any other hand held devices which support learning 24x7 from anywhere. The technology in this 21st century has built up students skills, increases students engagement and accelerate learning.(*Use of Technology in Teaching and Learning*, n.d.) In this changing pandemic environment the technology based world is at the fingertip of every student's where

they can get access to any information from anywhere. In today's era the mobile application plays a vital role with its unique features it sets the path to connect the user with the digital world by offering its best services. The main objective of quarantine education through online learning is that COVID-19 should not stop learning at any cost, because learning is a continuous process and must go on.

Smart Learning Through Apps

As a new paradigm of teaching, smart learning environment is based on smart devices and intelligent technologies.(Bognar et al., 2018) The form of education has faced a drastic change where the traditional mode of learning is shifting towards online learning. Now the teaching and learning is totally based on educational apps and video conference meeting apps. In such tough times when everything is just a one click away, education apps in India have brought a revolutionary change which has not only helped the students but also the teachers as well where the only motive of all is COVID-19 should not stop learning.

SOURCE:
https://img.kyodonews.net/english/public/images/posts/a8399e32 3406aa91b58cfbd22fb75d2e/cropped_image_l.jpg

Some of the popular Educational Apps and Video Conference Meeting Apps used by the students in this Quarantine period are discussed below:-

- ❖ **GOOGLE CLASSROOM:** Google Classroom is a free web service, developed in 2014 by Google for schools, that aims to simplify creating, distributing, and grading assignments in a paperless way. Google Classroom combines Google Drive for assignment creation and distribution, Google Docs, Sheets and Slides for writing, Gmail for communication, and Google Calendar for scheduling. Students can be invited to join a class through a private code, or automatically imported from a school domain. Each class creates a separate folder in the respective user's Drive, where the student can submit work to be graded by a teacher.

- ❖ **SKYPE:** Skype is a telecommunications application developed in 2003 that specializes in providing video chat and voice calls between computers, tablets, mobile devices. Users may transmit text, video, audio and images. Skype allows video conference calls and is one of the most well-known and popular online tutoring platform.

- ❖ **MOODLE CLOUD:** Moodle is the world's leading open source learning platform developed in 2001that allows educators to create a private space online and easily build courses and activities with flexible software tools for collaborative online learning, hosted in cloud. Moodle is a learning platform designed to provide educators, administrators and learners with a robust, secure and integrated system to create personalised learning environments.

- ❖ **ZOOM:** Zoom video communication developed in 2011 provides video telephony and online chat services through a cloud-based peer-to-peer software platform and is used for teleconferencing, telecommuting, distance education, and social relations.

- ❖ **KHAN ACADEMY:** Khan Academy is an American non-profit educational organization created in 2008 with the goal of creating a set of online tools that help educate students. The organization

produces short lessons in the form of videos. Its website also includes supplementary practice exercises and materials for educators. All resources are available for free to users of the website and app. This app has more than 10,000 video lectures on different academic subjects majorly focused on Mathematics and science.

- ❖ **BYJU'S:** It is one of the well funded and well-managed startup which has the motto to make learning fun for students. This app is already considered as one of the best education apps in India. It has very engaging video lessons which help in adaptive learning. This app also has complete mock tests and sample papers for class 7-12 for all the board exams which help in preparing for competitive exams like IIT-JEE, CAT and NEET. myCBSEGuide: This app has all the features a CBSE student will need. It has sample papers, mock tests, Video lessons, chapter wise questions, NCERT solutions for class 3-12. One of the best features of this app is it has quizzes which one can play with friends while learning and it also provides a gamified learning solution.

- ❖ **Unacademy:** Unacademy has some great educators including first Women IPS officer of India, Kiran Bedi. This app provides more than 2400 video lectures and specialized courses on all kind competitive exams which have benefited more than 300,000 students even from the remotest corner of the country. It is one of the best education apps in India which has helped the students to improve their writing skills, ability to speak and enhance their knowledge.

- ❖ **SWAYAM:** SWAYAM is a program initiated by Government of India on 2017 and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The Swayam Android application is designed for students to consume all Swayam content anywhere, anytime and anywhere.

SWAYAM is an initiative under Digital India to give a coordinated stage and free entry to web courses, covering all advanced education, High School and skill sector courses.

❖ **WHATSAPP:** WhatsApp Messenger developed in 2009 is an American freeware, cross-platform messaging and Voice over IP (VoIP) service owned by Facebook. It allows users to send text messages and voice messages make voice and video calls, and share images, documents, user locations, and other media. This app can also be used as a platform for online learning through videos, sharing PDF documents, PPTs, etc.

Objective

The objectives for carrying out the study are as follows:

- To identify the awareness about online classes and the Form/Mode used to do the class.

- To identify the software and the level of conversant with the use of software by the students.

- To determine the advantages gathered along with perception towards the method of online learning.

- To find out the prospects and challenges of online learning.

Methodology

The current study deals with online learning in Quarantine period and for carrying out this study two methods were applied, where on one hand an extensive literature review was done to get the ideas about the previous work done on the area of online learning and on the other hand a structured format of Questionnaire was prepared with Google Form and the Link has been distributed/shared on social media through WhatsApp, Messenger to the students of schools/colleges/universities in the Union Territory of Jammu &

Kashmir. As a result 201 number of responses received within 25 days and the responses received were analyzed and interpreted accordingly.

Data Analysis and Interpretation

The data that has been collected from the survey has been analyzed, interpreted and represented in a graphical format:

Fig.1: Student currently studying

Currently Studying
201 responses

- Secondary (6-10)
- Higher Secondary (11-12)
- Graduation
- Masters
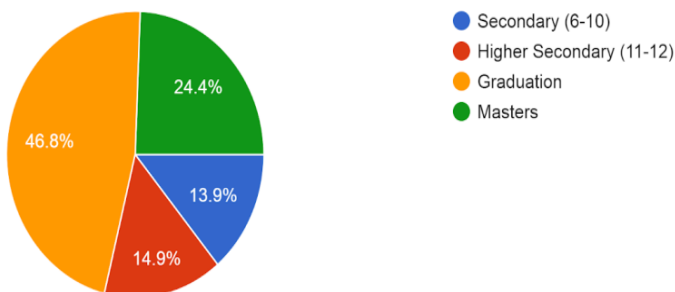
The Fig.1 graph reveals the students currently studying in schools, colleges or university which shows that 46.8% are the students of graduation, 24.4% are students of Masters, 14.95 are students of Higher secondary and 13.9% are students of secondary classes.

Table 1: Students attending online classes

Sl. no	Category	Number	Percentage
1.	YES	143	71.1%
2.	NO	58	28.9%
	Total	201	100%

Table 1 reveals that out of 201 students 143 (71.1%) are attending online classes and 58(28.9%) are not attending online classes.

Fig.2: Form of online learning
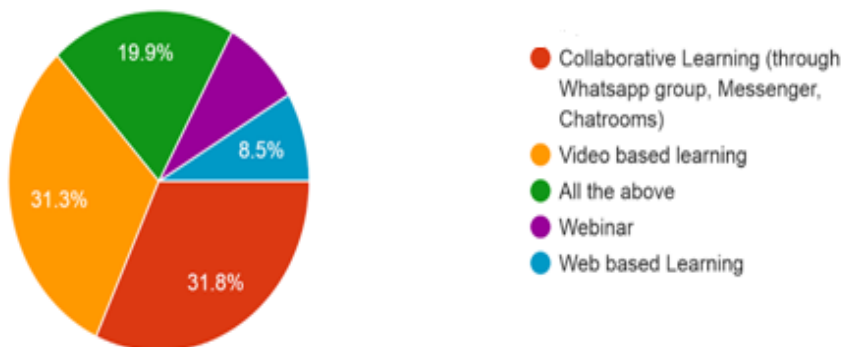
The graph in Fig.2 represents the form of online learning used by students which shows out of 201 students 31.85% use collaborative learning, 31.3% they use video based learning, 19.9% use all the forms of learning.

Fig.3: Application software used to attend online class
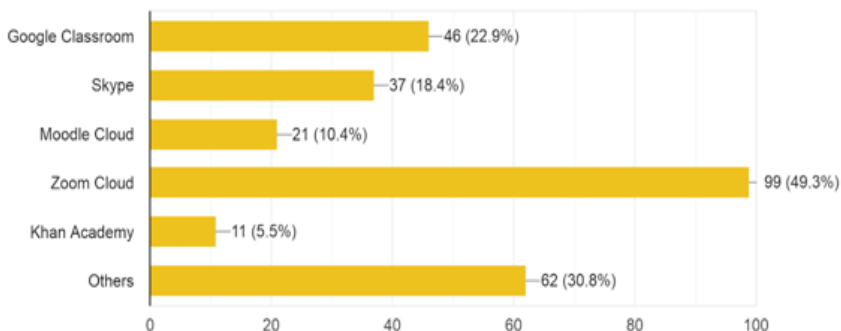
Figure 3 shows that the application software used to attend online classes by students are out of 201 students 49.3% are using Zoom Cloud App, 30.8% are using other Apps, 22.9% are using Google classroom, 18.4% are using Skype, 10.45% are using Moodle cloud and 5.55 are using Khan Academy.

Fig.4: Submitting Assignments and Projects through online mode
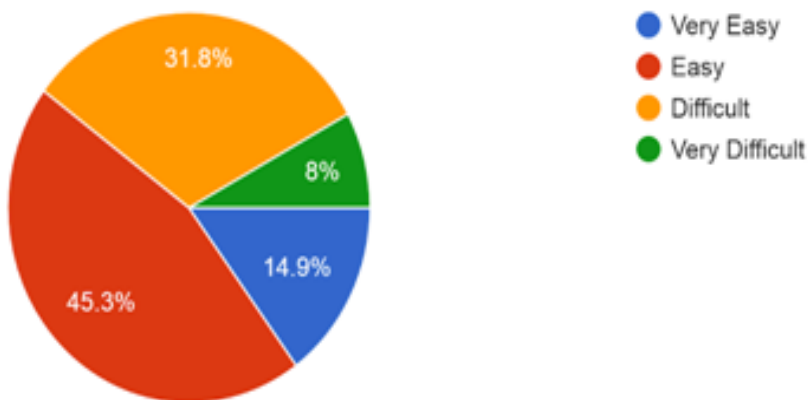
The graphical presentation shows that how the students find submitting projects through online mode which shows that out of 201 students 45.3% students find it easy, 31.8% find it difficult, 14.9% find it very easy and the remaining 8% found it very difficult to submit projects through online mode.

Table 2: Teacher's expertise in using technology

Sl.No.	Category	Number	Percentage
1.	Poor	36	17.9%
2.	Average	72	35.8%
3.	Moderate	68	33.8%
4.	Excellent	31	15.4%
	Total	201	100%

Table 2 portrays students observation regarding teachers expertise in using technology while conducting online classes which states that out of 201 students 35.8% observed teachers are having average knowledge, 33.8% observed moderate knowledge, 17.9% observed poor knowledge of teachers on use of technology and only 15.4% are

having excellent knowledge on use of technology which conducting online classes.

Fig.5: Advantages of online classes during Lockdown
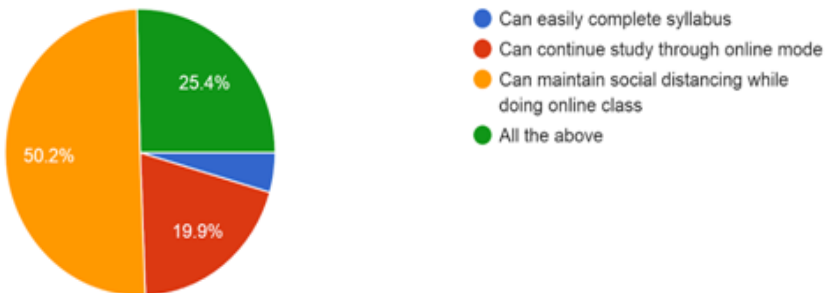
The figure depicts the advantages gathered by students from online learning during lockdown, which shows that 50.2% say they can maintain social distancing, 19.9% say can continue study through online mode and 25.4% say they can easily complete syllabus, can continue study, can maintain social distancing.

Fig. 6: Problems faced while attending online classes
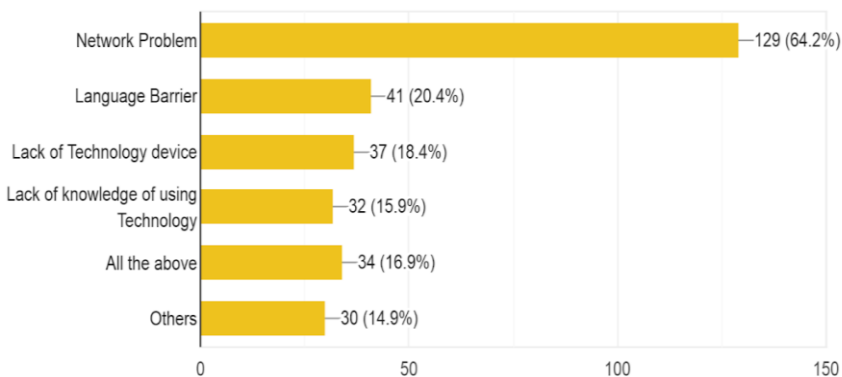
Table 3: Interest to continue online class in future

Sl.No.	Category	Percentage
1.	Yes	46.3%
2.	No	53.7%
	Total	100%

The table shows that only 46.3% students are interested to continue online classes whereas 53.7% are not interested to continue due to many problems.

Prospect And Challenges Of Online Learning:

The future prospect of online learning is that with the help of internet the students can be in touch with their teachers and classmates through social media, messaging Apps. Online learning can improve or advance the quality of learning through videos and web tutorials which is affordable and cost effective. The teaching and learning will become interesting with the use of animation, power point slides, videos, images to catch student's interest and attention. Internet is helping the students to keep themselves up-to-date with the latest information on their subject.

Online learning being the latest wave of education face many challenges as well for both teachers and students while attending online classes which also need to be focused to keep the process of education continue. Network problem is one of the many challenges faced by students and teachers which break the connectivity and ultimately student lose interest. Many students are not technologically proficient, having lack of knowledge on use of technology which can create interruptions and hindrances in classes, so for this basic courses on computer is a must for continuing online classes. Language barrier is also a problem where many students from non-english medium background are facing problems in interacting and understanding the English conversation which might be possible to clear in a traditional

based classroom. Students from financially poor background are also facing major challenges in attending online classes as they are not able to purchase technological device like laptop, mobile, tab etc. to continue classes.

Conclusion and Suggestions

After the outbreak of COVID-19, the school/colleges/universities all over the world stand closed. Due to this closure the educational institution will have a negative impact on student's education but does that mean education will stop? No, we have to move on with an alternate mode of learning i.e. online learning/virtual learning. With the proliferation of online learning it is very essential to understand the engagement and knowledge gaining capacity of students, who only have an opportunity for online learning in this lockdown period to continue their studies.(Dumford & Miller, 2018) So, Jammu and Kashmir being a conflicted state the constant closure of educational institution due to many unavoidable issues in the valley is quite normal which creates an ambience of conflict, fear and instability which has completely destroyed the mentality of students in relation to education and learning. The prospects of online learning are many but taking into consideration the scenario of education in the valley it's high time to focus on the challenges. From the data analysis it has been revealed that students are suffering in this lockdown period mainly due to network problem with 2G speed which being the biggest obstacle in the process of continuing online education in this 21st century. It's also a challenge for the teachers to reach to those students who don't have the privilege of having computers or smart phones. 20.4% students are having language barrier where they are not able to interact with the teachers and clear their doubts. As the current pandemic has thrown open lot of challenges and these challenges are equally true with regard to continue the education in J&K valley where they frequently face problems like from no internet to low internet which revealed that 53.7% students are not interested to continue

online learning in this Lockdown period. For the students of the valley Digitalization is just a word and Digital India is just a dream. So to sort out these complications in the valley and to continue the quarantine education through online learning mode the Government Authorities must look after these issues and fix it so that learning be possible and smooth enough.

Based on the findings of this study and its conclusions, the following recommendations are made:

- A high-speed internet connection must be provided in the valley to continue online learning from home.

- It has been observed 28.9% students are not well conversant with the use or functioning of Apps being suggested by the teachers and it has been observed by the students that 35.8% teachers are having average knowledge n 17.9% are having poor knowledge on use of technology. So, it's highly recommended students and teachers must have knowledge of utilizing ICT facilities for instructional or educational purposes, they must have IT training.

- The Government must strengthen the online mode of education from user level, institution level and from administration level as well to make quarantine education a successful one.

- Government must provide technological device to the needy n poor students to continue their online classes.

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Building the Metadata Quality Digital Repository for the Institution for Promoting the online Document Delivery services

Manoj Das[*]
Sangeeta Singh[**]

Abstract:

The present study is to create a metadata quality fully digital repository and provide online document delivery services through that digital repository. Every educational institution in the present age needs to create a complete digital repository of metadata quality. Some processes need to be maintained to create a fully digital repository of this metadata quality. A digital repository will be created with some software and computers. Based on the documents, the digital repository has to be configured according to the requirement and the documents have to be entered and stored in it. When storing documents, you need to evaluate the metadata well with the documents and create the metadata so that the exact details of the documents can be found. Given the current situation, every educational institution needs to create a good quality full digital repository so that students do not have any problems. Every educational institution can provide a document service to its students through an online document delivery service. With all of these aspects in mind, the current study is "Building the metadata quality digital repository for the institution for promoting the online document

* Ph. D. Research Scholar; Library & Information Science;
Dr. C. V. Raman University, Bilaspur; mndas.1987@gmail.com
** Associate Professor; Dept. of Library & Information Science;
Dr. C. V. Raman University, Bilaspur; sangeetamanoj3@gmail.com

delivery services" completed, with some software installation and configuration.

Keywords: Digital Repository, Metadata, Digital Software's, Digital Library, Metadata Quality.

Introduction:

The term digital repository refers to some digital content that is stored, and if the content is metadata quality then it is called metadata quality digital repository. A digital repository can organize and store digital documents in a very beautiful way and over time it makes them more accessible to students. If an educational institution has a digital repository, then there is no fear of documents being lost, nor are there any books to lose. Below are some details on why a metadata quality requires a fully digital repository:

- Helps to arrange each document beautifully and stays in the same condition.
- Do not let the quality of documents be lost.
- Documents can be stored for a long time saves a lot of space in the library of the educational institution.
- Helps library staff to find documents.
- Students of the educational institution can collect documents from any place at any time.
- No specific time is required to collect documents.
- Even if there is a problem like a coronavirus, there is no obstacle to collect documents.
- Helps to find documents in a very short time, which is very necessary for the current era.
- From this, it can be said that metadata quality fully digital repository plays a big role for the students of the present age.

Objectives:

A full digital repository of metadata quality is very much needed in every educational institution. Below are some of the purposes of creating a digital repository:

1. Find out how to build a digital repository.
2. Find out how to easily create a digital repository.
3. Find out how the students of the educational institution can easily collect documents from home.
4. To find out so that the documents of the educational institution are not damaged.
5. To find out how each educational institution can provide online services to their documents.

Methodology:

To create a metadata quality full digital repository, some methods have to be followed. Some software and machines are needed to create this repository. First, need to install an operating system then you have to configure that operating system and install a digital library software there. After installing the digital library software, you need to configure it, enter the metadata, upload the documents, and create it in a database. Then by running the index in the digital repository, a complete digital repository of metadata quality will be created in a fully searchable manner.

Importance:

Good metadata full digital repository is a big aspect for students of the present age because if a good metadata digital repository is not created then students will be given wrong information. It is common to see that there are digital repositories of all levels, which can lead to many mistakes, which can lead to many problems for students. So a good metadata quality full digital repository should be created so that a document can be synchronized properly. Good quality complete metadata highlights the inside of a document, which is always used

for the right purpose. The biggest aspect is how to turn a traditional document into a digital document and create a digital repository with the right metadata. Considering the problems of the present age, every school, college, and university needs to create a quality full digital repository so that those educational institutions can hand over their digital documents to the students in a very easy way. Every educational institution has to create a digital repository in their educational institution in such a way that in case of any problem like in the present age, they can hand over the required documents to the students so that the students can get everything from home. With all these aspects in mind, every educational institution should take the initiative to create a fully digital repository of metadata quality.

Build the Operating System:

To create a digital repository, you first need to install and configure a Linux version of the operating system.

Here are some steps to build an operating system:

➢ Download the Linux version operating system from the internet.
➢ Bootable to pen drive with the downloaded OS through Rufus software.
➢ Install Linux version operating system through a bootable pen drive.
➢ Network connectivity to installed Linux version operating system.
➢ Configure the installed operating system with other necessary tools.

Build the Digital Repository:

- **Install Digital Library Software:**

Installing digital library software requires some necessary software to create a digital library, such as:

a. DSpace (Digital Library Software)
b. PGSQL (Relational Database Software)
c. Apache Tomcat (Web Server Software)
d. Apache Maven Software
e. Apache Ant Software
f. JDK (Java Development Kit)

Installing a digital repository software is complete after installing all of the above software. All of this software are interdependent, so to install a digital library software you need to install the above software first.

● **Design the Digital Repository:**

To build a mature digital repository, you have to design it after installing digital library software. After installing this digital library software many aspects need to be designed, such as:

a) Logo update:

Digital repository software has a default logo when it is installed but after installing it, the logo of any educational institution is modified and updated in the digital repository. And to update it, you have to change two files, such as:

i. Put the logo to **"Home/dspace/dspace/webapps/ xmlui/themes/Mirage/images"**

ii. Edit the files in "**home/dspace/dspace/webapps/xmlui/ themes/Mirage/lib/css/style.css** (background: url ('.../.../images/**cvraman logo.png'**) ;)" location.

After making these two changes, the logo will be updated as soon as restart apache tomcat.

b) Header Name Update:

After the digital repository software is installed, there is a default header name, then the header name is changed according to one's

choice according to the name of a particular educational institution so that everyone can see and understand.

Example:

Go to **"Home/dspace/dspace/webapps/xmlui/themes/ Mirage/lib/css/style.css"** location and change the header name.

After making these two changes, I will update the logo as soon as I restart Apache Tomcat.

c) Header Color Update:

After the digital repository software is installed, there is a default header color, then the header color is changed to your liking so that it looks good.

Example:

Go to "**Home/dspace/dspace/webapps/xmlui/themes/ Mirage/lib/css/style.css"** location and change the header color.

After this change, the color will be updated as soon as Apache Tomcat is restarted.

d) Theme Update:

After the digital repository software is installed, there is a default theme, then those themes are changed as per one's choice to make it look good.

Example:

Go to **"Home/dspace/dspace/conf/xmlui.xconf"** location and Find Tag Comment/Uncomment Tags to select **Theme.**

After making this change, the theme will be updated as soon as the apache tomcat is restarted.

e) Body Update:

After the digital repository software is installed, there is a default body, then that body is changed as per one's choice so that it looks good.

Example:

Go to **"Home/dspace/dspace/config/news-xmlui.xml"** location and change the body details. After making this change, the body will be updated as soon as Apache Tomcat is restarted. **f) DDC classification:**

After the digital repository software is installed, there is a default subject keyword, then that subject keyword is configured in DDC classification as per the requirement of the own documents so that the documents can be input properly.

Example:

i. Download ddcE.xml file from web site to the path **"/home/dspace/dspace/config/controlled-vocabularies"**

ii. Edit **"/home/dspace/dspace/config/dspace.cfg"** file choices. Plugin. dc. subject = **srsc to ddcE**

iii. Edit **"/home/dspace/dspace/input-forms.xml"**

After these changes, the DDC classification will be updated as soon as the apache tomcat is restarted.

g) Metadata form Design:

Once the digital repository software is installed there is a default metadata entry form and there are 15 fields but many times there are some documents that cannot cover those 15 fields so the metadata form is designed to properly input the metadata to the documents.

Example:

Go to **"/home/dspace/dspace/input-forms.xml"** location and design the form.

After making this change, the new metadata entry form will be updated as Apache Tomcat is restarted.

h) Metadata Registration:

There are 15 fields with the metadata entry form. Many times when you try to enter data, some documents do not fall into that field, so some fields are added according to the documents which can enter all the documents.

Example:

    i. Login of the digital repository as an administrator login
    ii. Click on Metadata under the Registries
    iii. Create a new metadata schema under the new schema name
    iv. Add a new metadata field under the metadata schema.

After adding this metadata, the new field is updated as soon as you restart Apache Tomcat.

i) Domain Name Configuration:

After creating a digital repository, it only runs on the local machine, that is, on the local network, but it does not run on any external machine or network, so no one can use any of the documents in that repository. So the domain name is set up so that the documents in that repository can be used from outside.

Example:

Go to **"/home/dspace/dspace/config/dspace.cfg"** location and change the domain name **"http://10.18.20.78:8080/xmlui"** to **"http://ndl.iitkgp.gov.in".**

This domain name is set up by going to a specific file and changing some IP, the domain name is set up and after changing the domain name, the domain name is set up only when apache tomcat is restarted.

i) Mail Configuration:

It is often seen that many repositories have some important documents which are not given access to everyone. The Institute Authority restricts those important documents to their repository so that no one can access them. If a student needs those important documents, then they have to request to the authority for the documents for access permission. But the problem is that if there is no mail configuration in the repository, then no one can send the request online, so the mail configuration is done so that the users can send the request.

Example:

Go to **"/home/dspace/dspace/config/dspace.cfg"** location and configure the mail setup.

This change is made in dspace.cfg there is a file called where there is a mail configuration option.

Creation of Community, Collection, and Item:

After creating a digital repository, community and collection should be created according to the documents of the educational institution, so that the documents within that community and collection can be stored according to the subject or department. If the documents can be stored according to the subject or department, then the documents are easy to find.

Community, Collection and Item submit workflow:
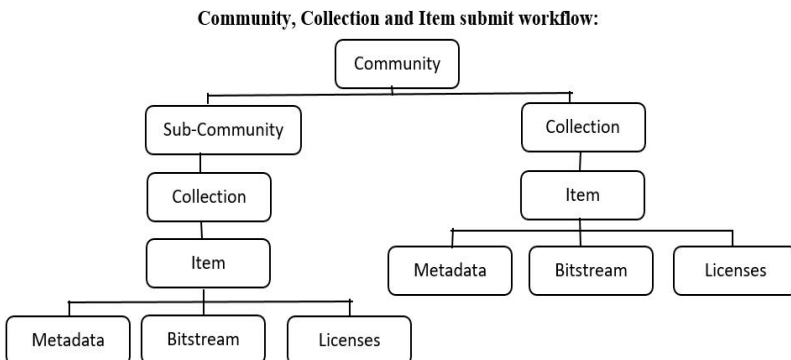
Item Entry Workflow Management:

Data entry is the main lesson for creating a digital database of educational institutions. The most important thing to create a digital repository is data entry because a good database is created by entering data with the right metadata. A complete database is created by analysing the documents properly and entering the data with the correct metadata which helps to provide online document delivery service.

Item Entry Workflow Management
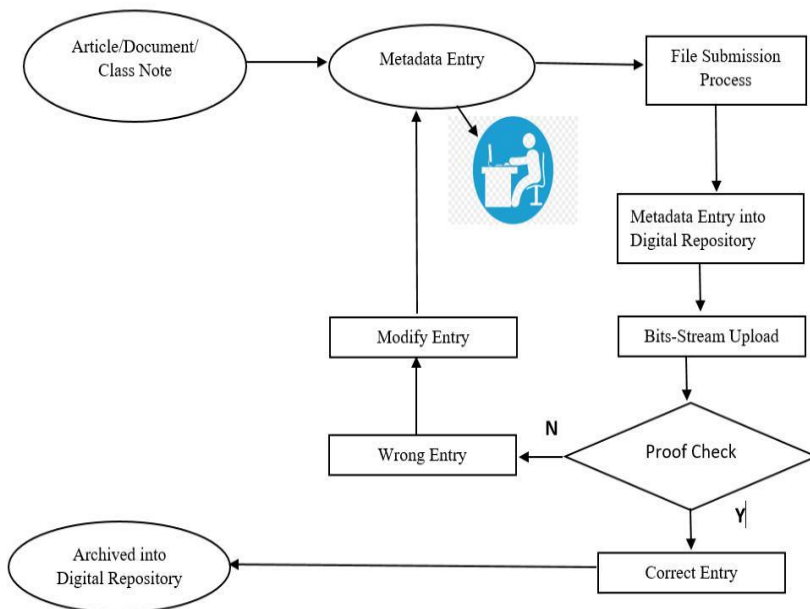
Metadata Quality Mandated:

Metadata plays an important role in the case of documents; the details of a document are highlighted by the correct metadata. When a document is stored in a repository, if the details are not stored consistently with the correct metadata, then misinformation is given to the users, so the correct metadata entry based on a document is

important. When metadata is entered, it is entered in a format that increases the quality of metadata and documents. There are three types of metadata and data entry should be done according to the three types of metadata format that always help to present a document correctly. Three types of metadata are:

- Descriptive,
- Structural, and
- Administrative.

Descriptive metadata is typically used for discovery and identification, as information to search and locate an object, such as title, author, subjects, keywords, publisher.

Structural metadata describes how the components of an object are organized.

Administrative metadata gives information to help manage the source.

Metadata

Descriptive   Structural

Administrative
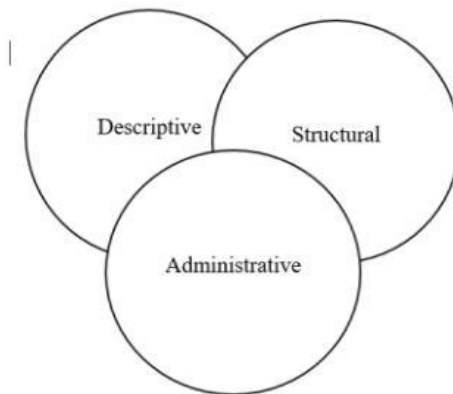
Online Document Delivery Service:

A project to create digital documents from traditional documents with the current era in mind. Many students are not able to collect their required study materials due to pandemic conditions like the

coronavirus which has caused them various problems. So the decision was made to create a digital repository so that students could be provided with online document delivery services.

Online Document Delivery Service
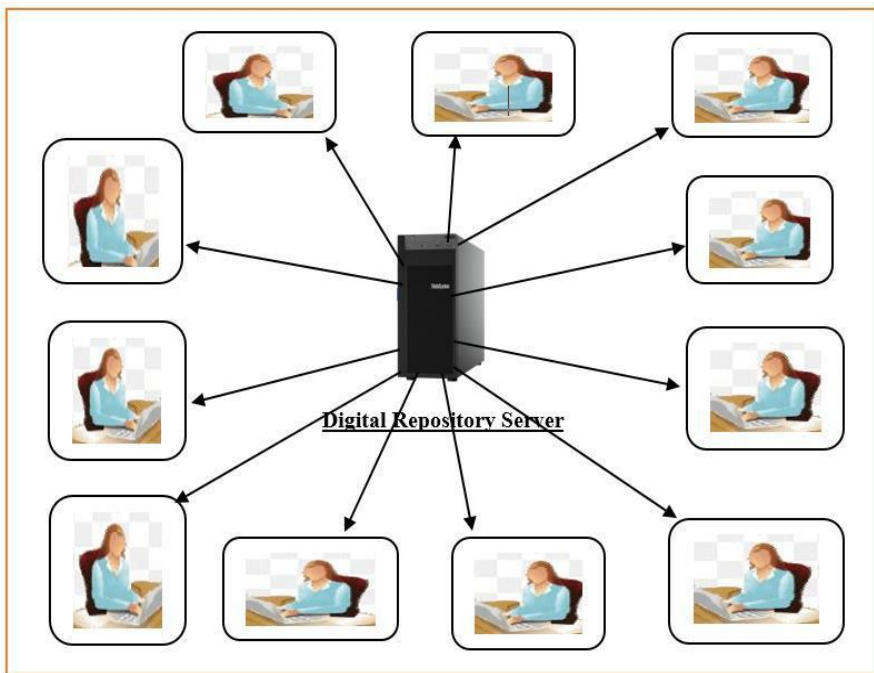
Conclusion:

Creating a digital repository is very important in this day and age. If a digital repository is created in every educational institution and all the study materials of the educational institution are converted from traditional documents to digital documents and stored in the digital repository, then it will be very easy to provide online document delivery service. After creating a digital repository, if it is converted from local access to public access, students will benefit a lot. Students can collect their required documents from any place at any time. So creating a digital repository in every educational institution should play a big role.

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Web 3.0: Milestone for Future Internet

Ms. Reshu Gupta[*]
Dr. Pallavi Agarwal[**]
Mr. Vishal Varma[***]

Abstract

When something leaves the planet, something new is born. Web 2.0 is shortly reaching to get replaced with its smarter sibling i.e. Web 3.0; overcoming the problems of security and privacy.

Instead of insecure databases and opaque data sharing practices, Web 3.0 will manage it to the users which mean they will be ready to access data from anywhere; mainly being driven by cloud applications and smart-phones. With feature of security, personalization is another add-on. The upcoming evolution of the Web involves the Semantic Web.

Keywords:

Web 3.0, Security, database, privacy, economy, Semantic.

Introduction:

There is no perfect definition for Web 3.0 yet and also the technology that will bring us there has not even matured yet. John Markoff of the New York Times recently suggested name of this third-generation of the Web, "Web 3.0".To describe web 3.0, the most appropriate word will be "an intelligent web." It is truly an evolution of and introduction of 3rd generation internet world is the combination of

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* Research Scholar, SES, Bhartiya Skill Development University Jaipur
** Astt. Prof., SES, Bhartiya Skill Development University Jaipur
*** Research Scholar, SES, Bhartiya Skill Development University Jaipur
reshu.gupta@ruj-bsdu.in ; reshugupta111@gmail.com

semantic web, artificial intelligence, data mining, Natural language search and machine learning.

Experts' opinion about web 3.0 is that it will be additional user friendly, interactive and intelligent. User will type a query on the web; web will understand it and meet the requirements of the user.

That means, if anyone is searching for online shopping, he or she will receive more advertisements related to shopping sites. When someone searches for specific product, the search engine will keep in mind about your previous search & show you the result combining "shopping sites & that particular product."

We can say that next generation search will support user's behaviour & preferences.

Difference between Web 1.0, 2.0, 3.0:

Web1.0- Web 1.0 refers to the first stage of the internet evolution. In Web 1.0 advertisements on websites while surfing the internet was prohibited. It can be used as personal websites. It costs to user as per pages viewed. It has directories which enable user to retrieve a specific piece of data.

Web 2.0- Web 2.0 refers to world wide website that highlights user-generated content, usability and ability to exchange information to end users. An interaction and collaboration with each other is allowed by Web 2.0 in a social media dialogue as creator of user-generated content in a virtual community. Web 2.0 applications are mainly for interaction with the end user.

Web 3.0- It refers the evolution of web utilization and interaction which incorporates altering the web into a database. Web 3.0 promises to establish "the world's information" in more reasonable way than Google can ever attain with their existing engine schema.

The difference between Web 2.0 and 3.0 is that Web 3.0 is centralised on the use of technologies like machine learning and AI to provide relevant content for every user rather than simply the content other end users have provided. Web 2.0 basically permits users to contribute and generally collaborate on website content, whereas Web 3.0 can flip these jobs over to the semantic web and AI technologies.

Web 2.0 is largely concerning of words; Web 3.0 will be the mixture of words and visualization.

Fig1: Difference between Web 1.0, 2.0, 3.0

Web 1.0	Web 2.0	Web 3.0
The Web	The Social Web	The Semantic Web
Read-only Web	Read and Write Web	Read, Write and Execute Web
Information sharing	Interaction	Immersion
Connect Information	Connect People	Connect context, people and knowledge
All about static content (one-way interaction)	Two-way communication through social networking, blogging etc.	Visualization
Owning content	Sharing content	Consolidating content
Web Forms	Web Applications	Smart Applications
HTML Portals	XML/RSS	RDF/RDFS/OWL
Banner Advertising	Interactive advertising	Behavioral Advertising
Britannica Online	Wikipedia	Semantic Web

Source: https://hackernoon.com/embracing-web-3-0-the-new-internet-era-will-begin-soon-630ff6c2e7b6

Web 3.0 will focus on:

1. Limits and manage user content.

2. Turns web into an enormous database.

3. Organizing data in a purposeful way.

Fig.2- web 1.0, 2.0, 3.0
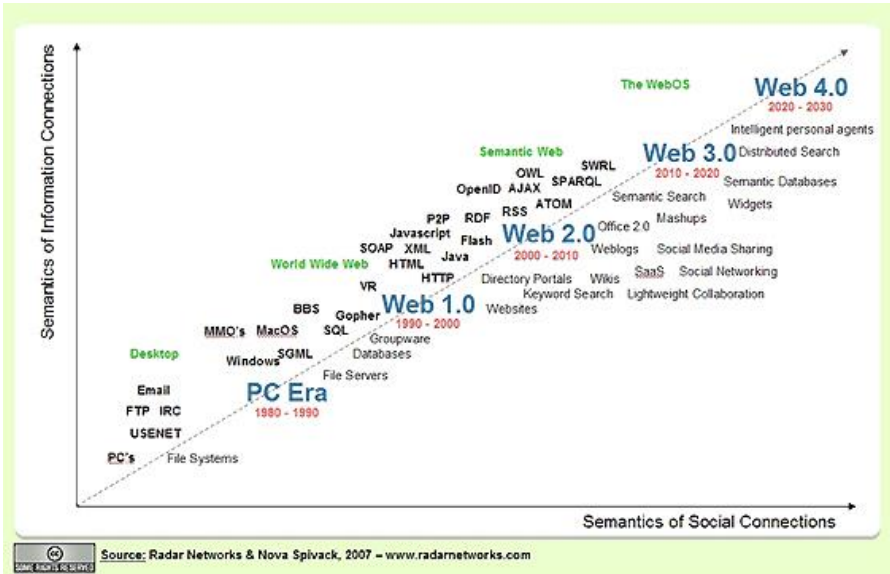

Source: www.radarnetworks.com

Web 2.0:

If anyone wants to go for movie and shopping, he or she will go to Google and look through a lot of information on the web, and then he or she will start comparing timings and rates etc. It will be time consuming.

Web 3.0:

By search engine help, a person can be able to generate information faster. Search engine will provide very accurate data & recommendation based on that person's profile. That person can get information in very short time.

As Gian Gonzaga, Ph.D., senior director of research and development at the dating site eHarmony, says, **"The Web can give something back that was not previously known. Web 3.0 learns and understands who you are and gives you something back."**

Few examples of applications that will be used in Web 3.0:
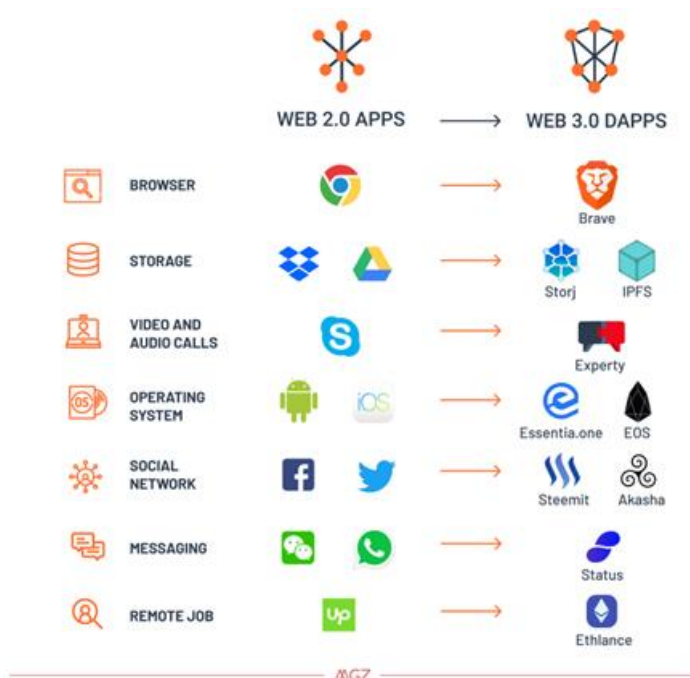
Why there is need of Web 3.0:

While using web 2.0, still the biggest issue is of security and privacy of data. We all are aware that when user is getting information from web, he or she is providing more information to web so that it can give more accurate result. But the question of security is arises here.

Technology used in Web 3.0:

Web 3.0 technology is using Block Chain technology to store data in secure way. As Block chain technology works, data, personal information will not be stored in large data centres and data bases of the companies. Decentralization of data is to be done.

All data will be controlled by a single company; this will decrease the personal data breaches.

Beginning of Web 3.0:

Etherm, public Block chain provide decentralization platform to remove middlemen. This enables users to communicate directly. In Web 3.0, Google, Facebook, Apple are listed, that would have no control over the data of users which would result in high security and privacy.

In current scenario there is always a need for identities, logins, OTPs etc. which disturbs the security.

Web 3.0 will use a cloud based data storing platform uses client side encryption for security reasons and a browser that provides unparallel privacy & security. This browser stays private on device.

Properties of Web 3.0:

There are four properties of web 3.0-

(a) Semantic Web- The semantic web will help teach the computer what the data means and that will evolve artificial intelligence that can utilize that information.

(b) Artificial Intelligence- Artificial intelligence will help machines become more intelligent to satisfy the needs of users.

(c) 3D Graphics- The three-dimensional design is being used extensively in websites and services in Web 3.0 such as online games, e-commerce, real-estate industry etc.

(d) Ubiquitous- Ubiquitous means the concept of existing or being everywhere, particularly at the same time i.e., omnipresent. We have already got this feature in Web 2.0 but not on every device. Development of mobile devices and internet access will make the web 3.0 experience available anywhere at any time with help of Internet of Things.

Advantages of Web 3.0:

1. No middle man to control data- As discussed above, data will be decentralized, so no other will be able to alter any information without permission on the network.

2. Less data breaches- As data will be decentralized; it will be difficult for hackers to have control over the entire network. There will be no data loss & ultimately will create a continuous flow of accurate information.

3. Ability to work on any gadget- Web 3.0 will provide easy customizable and device friendly application.

4. Uninterrupted service- Due to decentralised system, there will be continuous data processing –no system can be blocked to stop a service.

Disadvantages of Web 3.0:

1. Less advanced devices will not be able to handle Web 3.0.

2. Web 1.0 websites will seem that much more obsolete

3. It can be complicated for new users.

Challenges:

1. Huge Data Set- All are aware that World Wide Web contains millions of web pages contains million of web pages. At present the technology is sufficient environment not to get duplicate terms.

This new system will have to deal with huge sets of data.

2. Scalability- Entrepreneurs will have to worry about how to manage and organise the data, where to store it and how to find the right content.

Web 3.0 and economy:

Web 3.0, technology enable will have an impact on the global economy. As per a report growth in economy by web 3.0 will be of

$11 trillion per year in 2025. By this we will see the development of smart cities, new responsive personal services and increase commercial productivity.

1. Web 3.0 will contribute to the modern look of websites with 3D graphics and interactive experience.

2. It will help for easy to navigate website in order to provide simple user experience.

3. Artificial Intelligence-powered assistants are making the Future! Entrepreneurs must focus on developing the rich digital assets ensuring that search engine can find and provide the content easily.

Web 3.0 is all about making the life of people easier where they need not to install any application and time to time update that application, they have to access the file instantly from anywhere.

Conclusion:

Web 3.0 will change the life of people undoubtedly and make it hassle free to search anything from anywhere with data security feature. Features of web 3.0 will be helpful in global economy too. Web 3.0 will be more connected, open, and intelligent, with semantic web technologies, distributed databases, NLP, machine learning and artificial intelligence.

We still need some practical use-cases of Web 3.0 to truly understand the positive changes it can bring to our lives.

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Institutional Repositories & ETDs : An Overview

*Pratibha Kumari**
*Deepika Nirmal***

Abstract

One of the platforms to draft and publish digital content produced by the learned societies and is the rich source to disseminate them to its potential user, is Institutional Repository (IR).The philosophy of availability to the public without any restriction was firmly architecture in the year 2000, with the introduction of the 'Budapest Open Access Initiative (BOAI)'.The same i.e. the open access and interoperable framework was adopted by the Institutional repositories (IRs).As directed by Sir Dr. S.R. Ranganathan, providing right information to the right reader should be the aim of the profession. In this paper it is discussed that what are the things are to be taken while building an Institutional Repository and many more software for the fulfillment of this work.

Keywords- Institutional Repository, Repository, ETD, Repository software

Introduction

An array of initiatives continuously taken by libraries to increase the visibility and accessibility to the information through the resource

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* Research Scholar, Babasaheb Bhimrao Ambedkar University, Lucknow Uttar Pradesh
Email- pratibha25shah@gmail.com
** M.L.I.Sc, Babasaheb Bhimrao Ambedkar University, Lucknow Uttar Pradesh
Email- deepika.bbr@gmail.com

sharing in as consortia, interconnected links and many other, but these initiatives have disadvantage of limited access to literature for scholars. By establishing the institutional repositories, the institutions promote accessibility to their scholarly work. The technology used to open the doors behind which the knowledge was hidden once is the one we know i.e. internet.

"These are digital archives of intellectual products created by the faculty, staff, and students of an institution and accessible to end users both within and without the institution, with few if any barriers to access. Institutions may act independently or within a state or regional consortium" (Association of Research Libraries, 2004).

After the establishment of the many institutional repository or the open access archives, metadata harvester is the other service that has gained the momentum. Under this service the metadata from the many open journals and archives are harvested or indexed. In India major Research & Development institution and few Educational Institution provides an Institutional Repository (IR) service to their user group. The Institutions wants different kind of input for their various outcomes from their IR, but the number of institution agreed on the key point that their aim is to provide more visibility to the scholarly work.

Electronic Theses and Dissertation (ETDs)

ETDs are one such technology which enhances the theses and dissertations management in libraries. The theses and dissertation in the electronic structure has extended the open entryway for the client network to have a passageway to the learning embedded in these works through various international and national ETDs and databases. The conventional theses and dissertations in electronic format are characterized as ETD.

ETDs are broadly categorized into the two-

One is original - These are records that are set up by the creator electronically and after that are submitted in their endorsed electronic structure.

The second kind of ETD is regularly an electronic document that is made from the pages of a paper theory or thesis.

Benefits of ETD

- Greater accessibility as well as broader exposure of research of the university,

- Opportunities of using digital features, graphics, web links, etc.;

- Learning the essential techniques of publishing in an online environment contributes to professional development experience among researchers,

- Library storage space saving,

- Theses and dissertations more immediately accessibility than the printed to its potential reader every day at any time.

Repository

An IR is an extension of an educational institution's functions as a creator of primary works. The higher educational institution's IR normally contains pre-print of seminar paper, journal articles, report, research finding and data, theses and dissertation, material for teaching and learning and documents linking the establishment of the institution. It also provides a sustainable management framework system for digital format material.

Feature of Repository-

- It is a central place to store data and mine

- Server which can be accessible over network

- Contains scholarly material / electronic material
- Institutional Repository (IR) / e-prints archive/ Scholarly archives

Characteristics of an IR

The chief characteristics of an IR are as following-

- Defined by an organisation or the institute
- Scholarly work
- Perpetual and cumulative
- Interoperability
- Open accessibility

Objectives for having an IR

- For creating global visibility of scholarly research of an institution
- For providing open availability to the research work and output
- For locating contents on a single platform
- To collect, retain and preserve the originations digital assets like grey literature and easily lost literature

IR: Some thoughts

There are a variety of reasons for establishing an IR

- Storage and preservation of one's own publications
- IR helps to increase the accessibility to the scholarly work among the learner and scholars and also increases the impact of work
- Digital archiving supporting open access movement
- Improving the citation to research publication as the IR will be compatible (comply with OAI-PMH) and accessible throughout the every corner of the world.

An Institutional Repository contains

Institutional Repository contains the following documents

- Published material- The material which are already published and printed somewhere else. Example- Book, Conference and journal papers

- Unpublished / grey material- Those materials which are published nowhere. Example- minutes, theses and dissertation, course material, notes, per-print, working paper, etc.

- Supporting material - These are the material which provide support to the work. Example- Models, data sets, streaming media, etc.

Institution repository (Indian Context)

Types-

Broadly, in India, Institution Repository can be categories as-

- For specific in-house scholars- These kind of IR are those that work to distribute the scholarly outcome of the respective institute

- For Subject specific- The other kind of digital repositories works to collect the subject specific content and Offer access to collections of records unique to subject matter. Such repositories welcome the publications of any specialist or researcher associated with the particular work area.

- For Specific document – These kind of repositories offer accessibility to a range of documents having specific type. eg- Sodhganga, Vidyanidhi

Digital Repository Software's

There are a range of tools available to create / build institutional digital repositories.IR software are as:

Open Source Digital Repository Software –

- DSpace (http://www.dspace.org)
- EPrints (http://www.eprints.org)
- Fedora (Flexible Extensible Digital Object and Repository Architecture www.fedora.info)
- Greenstone (http://www.greenstone.org)

Commercial Digital Repository Software –

- CONTENTdm®
- Digi Tool
- EN Compass
- Meta Source
- Hyperion
- Archimede(http://archimede.bibl.ulaval.ca)
- CERN Document server software (CDSware)

Mostly software among these works on the Unix/Linux platform, with the following function
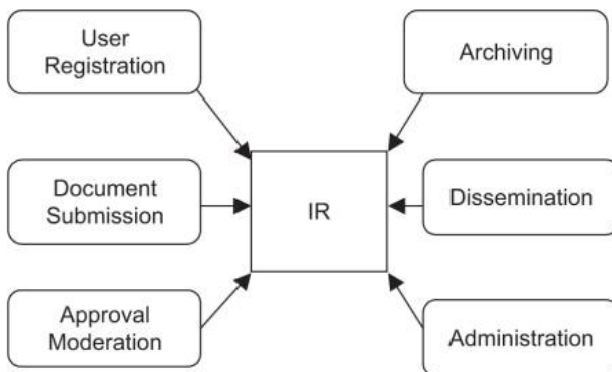
Standard criteria choosing the software

- Availability and technical assistance

- Comply with the latest version of OAI metadata harvesting protocols
- Latest software version

Steps of building an IR


```
Institutio    Repository
                          Project Initiation
                          Define Content
                          Define Feature set
                          Creating metadata, access protocol and maintenance
                          Choosen Tool
                          Install and maintain the system
```
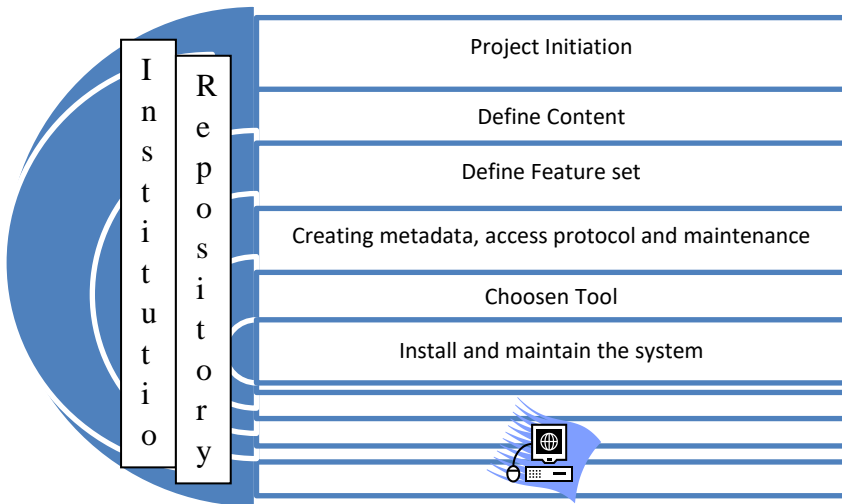
Possible obstacles in successfully building of an IR

- Funding
- Building the content
- Sustainable technical support
- Copyright
- Incentive
- Repository policy
- Promotional Challenge

Key issues and concerns

The main concern about ETDs that every establishment needs to address:

- Responsibility for rights,

- what get to is permitted to be accessed,
- how ETDs identify with distributers,
- the issue of literary theft, and
- the matter of expense

Drawback of IR

- The balance of institutional power is affected
- Depends of unscientific method for digital preservation
- Requires high cost initially
- They may need rapid wins in order to retain institutional support.

Conclusion

Institutional repositories are a small advance towards accomplishing a major target is to opportune individual at correct time with correct information. The institutional archive is an influential thought that can fill in as a motor of progress for establishments of advanced education, if IR is legitimately created, it propels an astounding number of objectives, and addresses a great scope of requirements.

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Emerging & Innovative Technology Applications in Libraries

*S Richhariya**

Abstract:

Recent technological advances have brought great changes to the library. Libraries are now automated and accessible to virtual libraries. Professionals also use different library platforms to manage information. Library switching has helped to provide easy access to collections through an online library catalog such as the On-line Public Access Catalog (OPAC). Cloud Computing helps provide easy access to digital resources to clients by retrieving location. Cloud computing can promote the implementation of Digital Library projects by reducing the costs involved throughout the processor and communicating with institutions more efficiently and effectively. This paper looks at the concept of an emerging & innovative technology applications in libraries.

Keywords: Information and Communication Technology, cloud computing, Big Data, AI

Introduction

We live in the age of information communication technology. Information technology plays a very important role in library science. The library sector is facing many challenges due to IT applications. With the advent of IT, libraries have become automated, which is a basic requirement for progress after the network and more efforts are moving towards virtual libraries. Emerging trends in digital libraries, e-publications, Internet usage, web applications for libraries and emerging consortium methods are leading to further growth in library

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* Librarian, Email: satyavanmlis83@gmail.com

services. Using cloud computing for various purposes is the latest technological trend in library science.

Emerging & innovative technology trends in libraries

Every day new technological innovations take place around the world. Due to technological change is the biggest challenge in the environment. Libraries need to adopt technological innovations to meet the demand of patron in terms of providing efficient and effective library services, the key libraries of today's digital world, taking into account the changing information needs of library users.

Semantic Web and Libraries

The Semantic Web is an extension of the World Wide Web through standards set by the World Wide Web Consortium. The goal of the Semantic Web is to make Internet data machine-readable. Semantic web brings structure into the meaningful content of web pages, creating an environment where software agents move from page to page. The semantic web is the web of data. This data may include dates, titles, part numbers, chemical properties, and other reversible data. Recently, the development of information and communication technology has led to the emergence of a wide variety of library resources and services - digital libraries, blogs, weblogs, Library 2.0 services and organizational archives. Because of these developments we are able to restore accurate and fast information to users. Web sites and web-based services are very important in libraries. Today, semantic websites are gaining a lot of popularity in the digital environment.

Cloud computing and Libraries

Cloud computing can transform the way systems are built and services delivered, providing libraries with an opportunity to extend their impact. Libraries modify their services with cloud and networking that allow them to access these services anytime, anywhere. Cloud computing offers a number of interesting possibilities for libraries, which can help reduce technical costs and increase the reliability and efficiency of certain types of automation operations. Libraries have

great potential for cloud computing. Libraries can add more content to cloud computing

Big Data and Libraries

Libraries now offer online resources and services. Libraries social media outlets use Facebook Instagram to promote their services and programs. With the help of evolving technology and tools, librarians can collect more and more online data and analyze it to add value to their services. Libraries can use big data to make good decisions about archiving developments, updating public spaces, and using library equipment.

The development of e-library systems and OCLC WorldCat is known as the initial application of big data in libraries. Large data libraries are directly and indirectly affected. Libraries have a direct impact on the use of large data tools to research large data sets. The indirect result is through library users who use a lot of big data in their research.

Artificial Intelligence and Libraries

Artificial intelligence has become one of them the main driving forces for the development of modernity Society, which has poured new energy Development of smart libraries. This paper explains Basic premise of smart library and artificial Analyzes intelligence and artificial application Intelligence in the field of smart library, and Shows the application value of the artificial Intelligence in the Library Service. Artificial intelligence widely used in smart development Libraries.

Internet of Things (IoT) and Libraries

Libraries must adopt IT-enabled content Development, content management tools, content access, delivery tools or longer Term presentation tools. Adoption and libraries are always at the forefront the use of new technologies is a cause for concern. Enables Internet of Things (IoT) objects Use to collect data and transfer data through the network without human intervention Internet, sensors, RFID. It is used in various fields and is still evolving. Various innovative solutions are

being created. This paper explores the concept of IoT Historical background and its potential applications in libraries.

Block chain Technology & Libraries

Block chain technology represents a decentralized database that keeps records of pseudonymized digital transactions that are visible to anyone within the network. Therefore, it is a new way to collect and store data. Block chain technology could be used to build an enhanced metadata system for libraries, to keep track of digital-first sale rights and ownership, to connect networks of libraries and universities, or even to support community-based borrowing and skill sharing programs.

QR Codes

Quick Response (QR) code is another gift of ICT. Camera equipped phone can be used to scan the QR code displayed by any the library. Users can simply the scan the QR code to know about the library working hours, resources available in the particular library by suing the applications such as BeeTagg or RedLaser.

Social Media and Mobile Applications

Social media is about communication and shaving through online communication channels. In another Social media is computer meditation that allows users to create content and interact with each other. Others. The first major purpose of social media is connectivity and the main purpose of social media that means you update yourself from the latest events in the world. Especially in the field of education Environment a note or update from a company can reach millions of users in seconds. And now Not only sound education but his alertness and dedication too are most required. Mobile application survival is a must Academic professionals to access information and resources. Now a days libraries attract students uploading a panoramic view of the library infrastructure.

Conclusion

As emerging technologies appear on the horizon of education every day, their adoption and integration into libraries is constantly changing

the world of teaching and research. This study makes it clear that it will have a greater impact not only on technologies the area of libraries and other places in the world. It shows the conversion of libraries from this traditionally computer-generated technologies.

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Availability of Open Research Data Repositories in Re3data.Org in Asia: A Study

H. Fakrudhin Ali Ahamed[*]

Abstract

This study focused on open research data repositories available in Asia. Purpose of the study is to identify the leading countries in terms of their contribution in re3data.org, country wise number of research data repositories available in Asia, subjects of the data repositories, content type and repository type of open research data repositories in Asian Countries. For data collection purpose the investigator selected the re3data.org. The study found that 3469 research data repositories available in the world. 197 repositories are contributed by Asian countries. Most of the repositories in Asian countries are covered by Science and related disciplines and less number of repositories are available in Engineering Sciences and Agriculture related disciplines. Most of the repositories are in Scientific and Statistical data format. Repositories are having more than one subject and more than one format. In Asia most of the repositories are in Open access and very few repositories are in closed and restricted access.

Keywords: Open Data, Research Data Repository, Repository Type and re3data.org.

Introduction

Open data is securing immense attention among various sectors of users, this data is being used for academic, administrative and many

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* Research Scholar, Department of Library & Information Science,
Central University of Tamil Nadu, Thiruvarur. E-mail: faa.ctr@gmail.com

other research purposes. With the amount of scientific data twin folding every year, problems surrounding the access, use, collection and preservation of data sets became vital. The growth of data-rich, researcher-driven environment that is growing creates new challenges and offers chances in the sharing, review and publication of results in research articles[1]. According to SPRAC, "Open Data is research data that is freely available on the internet permitting any user to download, copy, analyse, re-process, pass to software or use for any other purpose without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself"[2]. Research data repositories (RDR) are large database infrastructures set up to administer, distribute access and archive researchers' datasets. Repositories may be specific and promoted to comprehensive disciplinary data or more general, accumulate over wider domains of knowledge, such as the sciences or social sciences[3]. The stable access to research data is a new and difficult for all interested persons in the research group. Everlasting preservation and open access attitude to research data suggest ample chance for the research group worldwide. An increasing amount of Universities and research organizations are establishing research data repositories permitting access to data sets in a trust worthy situation. The landscape of research data repositories is heterogeneous, due to disciplinary and other requirement (Rücknagel et al., 2015). "Research data may be investigational, observational, operational, data from a third party, from the public sector, monitor data, processed data, or repurposed data". Data contains broad collection of information and data repositories preserve this information for reuse. (Johnston, 2017).

1http://www.sparc.arl.org /sites/default/files/Open%20Data%20Factsheet_0.pdf
2https://sparcopen.org/open-data/
3http://www.infotoday.com/cilmag/apr16/Uzwyshyn--Research-Data-Repositories.shtml

Related Studies

A Study by (Zuiderwijk Spiers, 2019) shows six reasons that encouraged the researchers' to re-use open research data, includes the researcher's environment; facilitate conditions, desirable performance, social and affiliation factors, effort and experience. (Wang, Chen, and Richards, 2018) found that data related to local statistics, credit records, and budget and spending are well released on data repositories in China. (Tenopir et al.2011) studied the role of open data in helping local governments to recognise their present shortcomings and give them recommendations by inferencing data. (Zhi-Feng, 2014) in this study data collected from re3data and Databib, and discussed the country wise, subject wise and Content type of research data repositories available in re3data and Databib and concluded that this study can help librarians grasp the related research data repository knowledge for providing information service. (Pampel et al., 2013) study summarizes the quality of re3data.org and demonstrates how this registry assists to recognize suitable repositories for storage and discovery of research data. (Mondal, 2018) carried out study on Indian data repositories available in re3data.org and found that majority of these data repositories are in scientific discipline. Most of the data repositories don't follow any metadata standards for datasets. Only few provide permanent data links.

Objectives of the study

1. To identify the leading countries in terms of their contribution in re3data.org.

2. To find out country wise number of research data repositories available in Asia

3. To examine the subjects of the open research data repositories in Asian Countries.

4. To find out the content type of the open research data repositories in Asian Countries.

5. To examine the repository type of open research data repositories in Asian Countries.

Methodology

The data were collected from re3data.org on 1st July, 2020. re3data.org is an international registry of research data repositories that includes research data repositories from diverse educational domains. It encourages an ethnicity of sharing, enlarged access and enhanced visibility of research data[4]. In re3data.org we can browse by subject, country and content type of available research data repositories. Investigator selected browse by "Country" option to study the above mentioned objectives. Using Micro Soft Excel Sheet data were processed and analysed. This study is limited to Asian countries and data repositories available in re3data.org are only taken into consideration.

Findings

Leading countries contribution in re3data.org

In March 2014 there is only 586 RDR available from 47 countries of the world (Zhi-Feng, 2014), which is increased to 3469 open data repositories available from 78 countries of the world in re3data.org as on 1st July, 2020. We can see that within 6 years there is an enormous growth in RDR. Through the analysis it is found that United States is the top contributor to re3data.org with 1078 open data repositories, followed by Germany (417), United Kingdom (286), European Union (269) and Canada (256) repositories respectively. Japan is the only

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4 https://www.re3data.org/about

Asian country listed in the top 10 position. All these top 10 countries are developed countries[5].
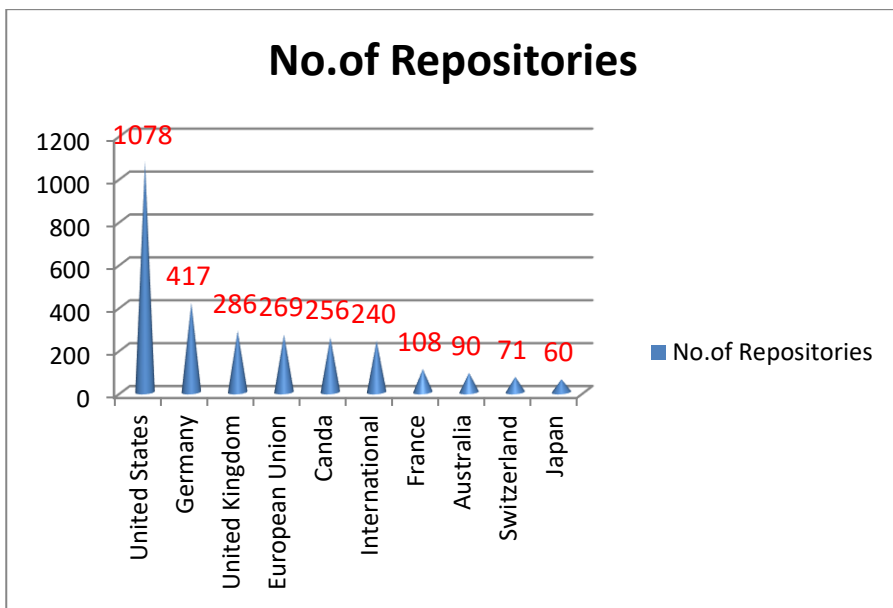

Figure 1: Country wise number of repositories.

Asian country wise number of repositories in re3data.org.

Through analysis it is found that 197 research data repositories are available in Asian Countries. In Asia Japan, Hong Kong, Singapore, South Korea, Taiwan and Cyprus are developed countries, remaining countries are developing countries[6]. In developed countries Japan is top contributor of data repositories (60) followed by Taiwan (10), South Korea (10) and Singapore (4), Hong Kong and Cyprus contributing two repositories each. In developing countries India (51) is the top contributor, followed by China (44), Indonesia (4), Turkey

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5According to International Monetary Fund accessed athttps://en.wikipedia.org/wiki/Developing_country
6 According to International Monetary Fund accessed athttps://en.wikipedia.org/wiki/Developing_country

(3), Thailand(2), and remaining countries namely Sri Lanka, Pakistan, Azerbaijan, Philippians and Kazakhstan are contributing one repository each.
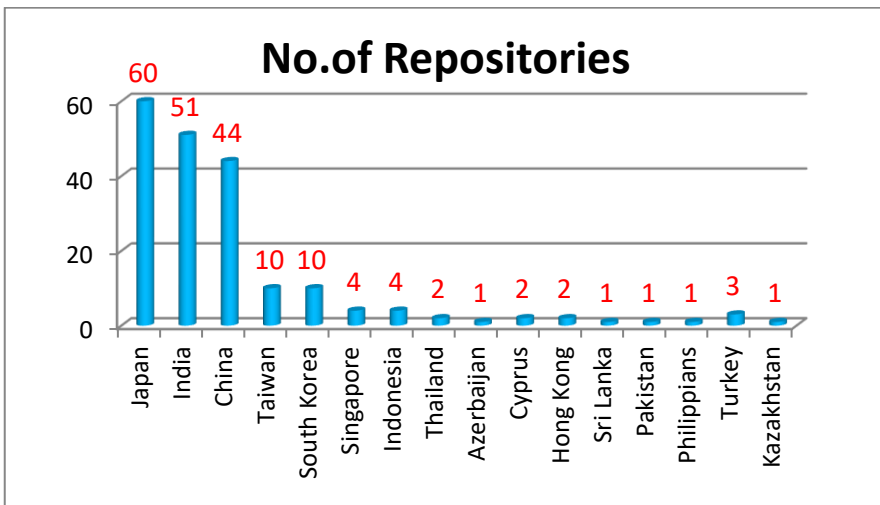

Figure 2: Asian country wise number of repositories

Subject of the research data repositories

For find the subject of the repositories, the broad subject categories are selected. It is found that most of the repositories cover more than one subject. In Asia most of the data repositories are available in Life Sciences (112) followed by Natural Science (97), Medicine (48), Humanities and Social Sciences (48), Engineering Sciences (27) and Agriculture and related disciplines (21). From the analysis it is found that most of the Asian data repositories cover Science related disciplines and less number of data repositories available in Engineering Sciences and Agriculture related disciplines.
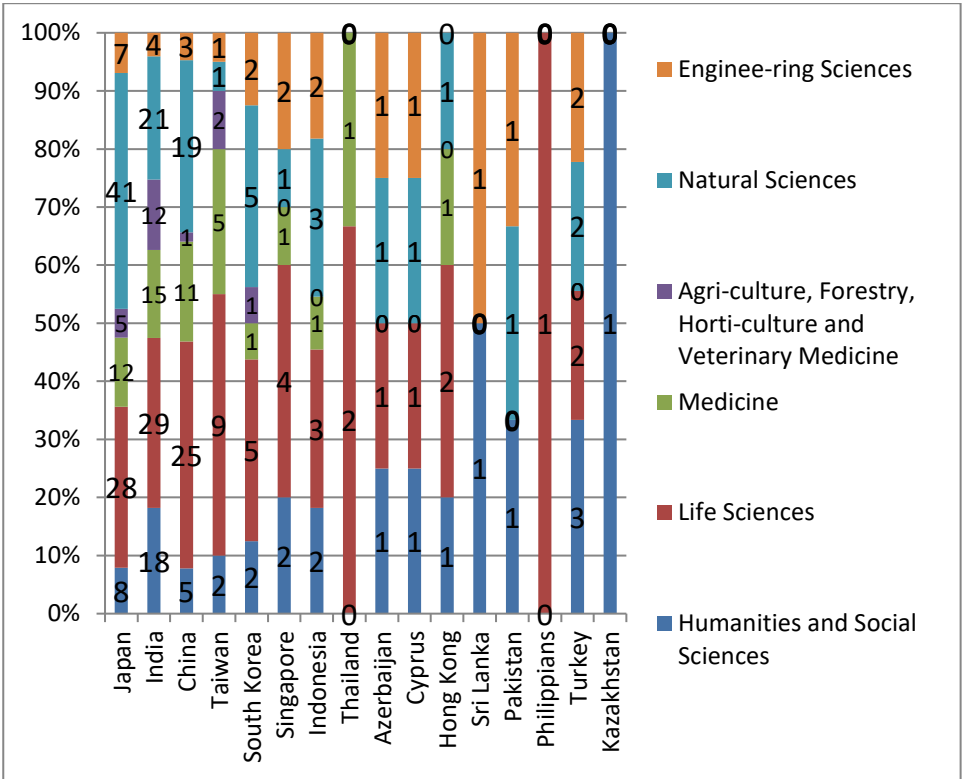
Figure 3: Subject of the repositories

Content type of the research data repositories.

From the analysis it is found that each data repository is having more than one format. Various content types are supported by the research data repositories. RDR contains structured and un-structured data. In Asia majority of the repositories (135) are available in Scientific and Statistical data formats followed by (111) in Standard Office document, (98) are images, (89) are in plain text, (87) are Raw data, (85) are structured graphics. Very less number of repositories (3) available in configuration data.
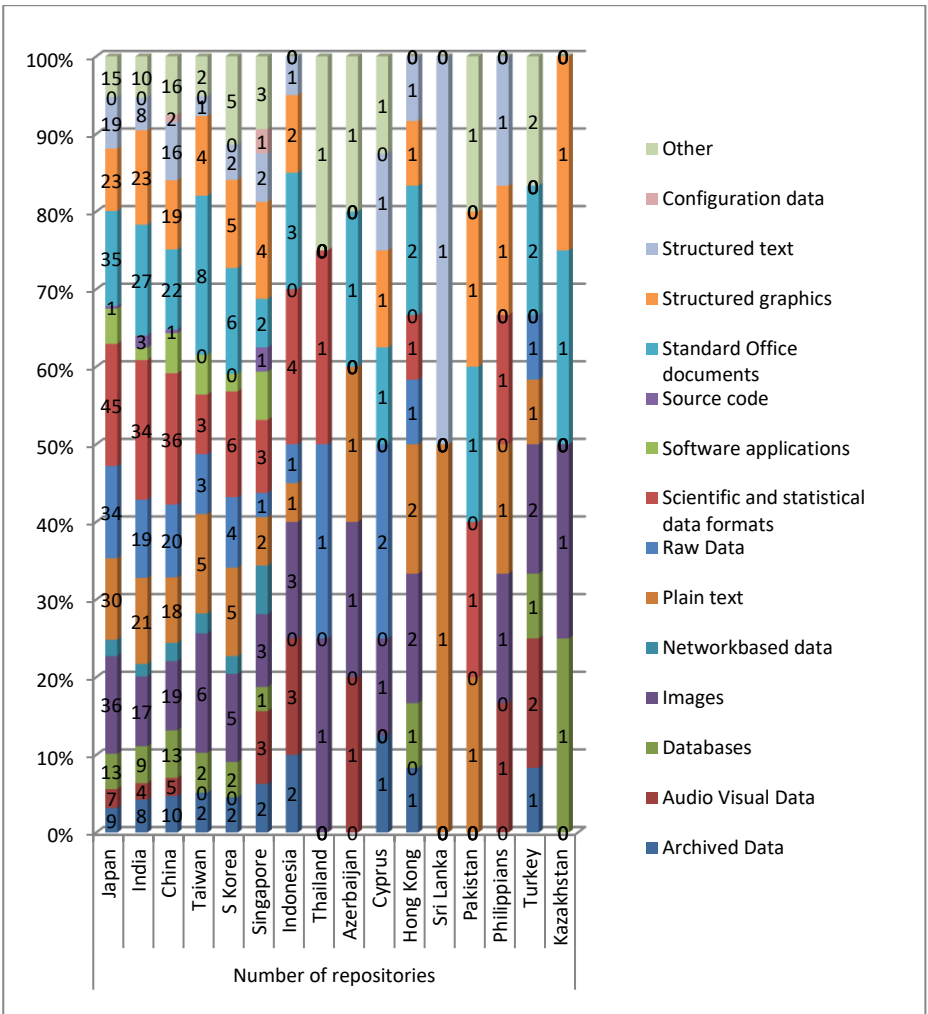
Figure 4: Research data content type

Data Repository types

Three types of repositories are available i.e., Institutional, Disciplinary and other types of repositories. In Asia most of the repositories are disciplinary (163) followed by few of them are institutional (40) and (31) are other types of repositories.
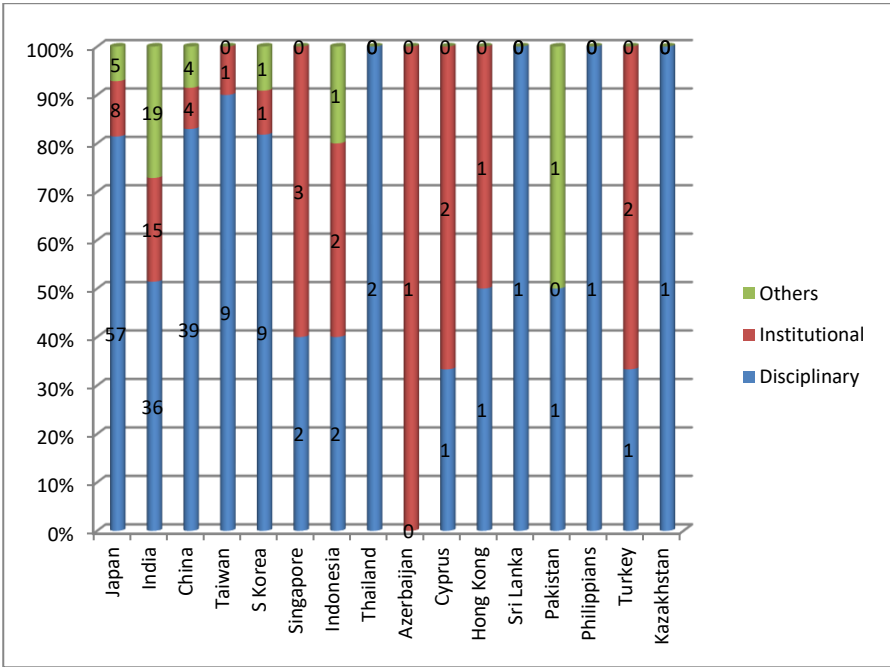
Figure 5: Repository Type

Access type of Repositories

Data repositories are providing three types of access i.e., open, closed and restricted. Most of the repositories in Asia are providing open access (187), followed by few repositories are in restricted (7) access and (3) are in closed access.
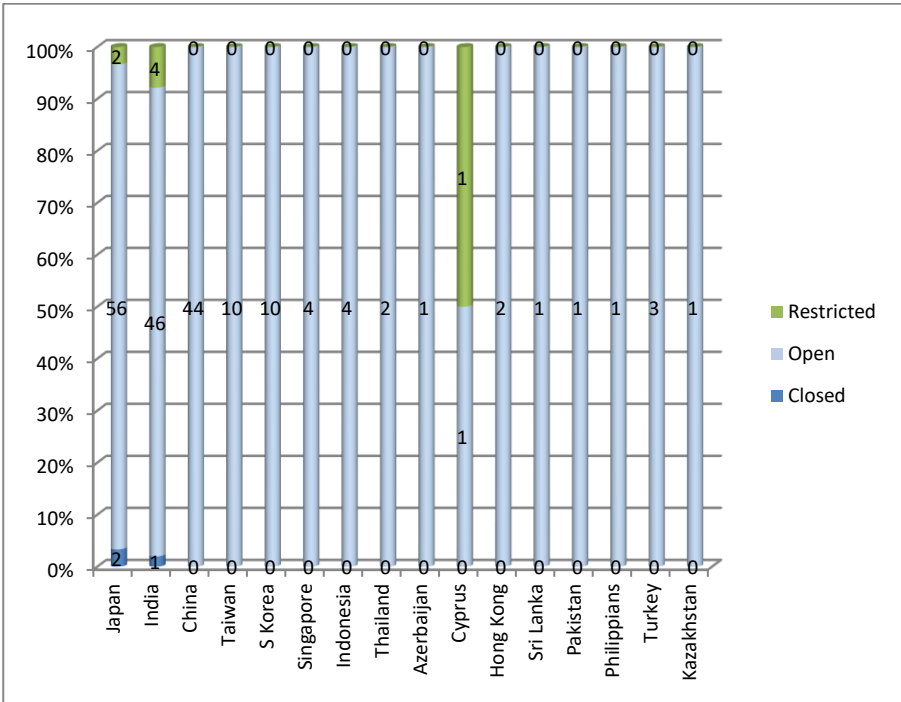
Figure 6: Access conditions of the repositories.

Conclusion

Research data repositories growth over last 6 years has increased enormously, 3469 repositories are available in the world. All the top ten contributors in re3data.org in the world are developed countries; United States is the top contributor in the world. Asian countries are contributing 197 RDR in re3data.org. In Asia Japan is the top contributor to RDR as a developed country and India is the top contributor as a developing country. In Asia each repository covers more than one subject and more than one format. Most of the repositories covers Science related disciplines, few repositories are in Engineering Science related disciplines, Majority of the repositories are in Scientific and statistical data format. Most of the repositories

are Disciplinary type. Majority repositories are available in open access and few of them are in restricted and closed access.

This article contributes to the open research data repositories available in Asia. Re3data.org is a platform to have more visibility for Open Research Data repositories accessible in the world to the user communities. This study will help researchers to find the required data available through these repositories. For Librarians this study will help them to provide information services to researchers regarding research data through registry of research data repositories (re3data.org). Librarians should create awareness about the available research data repositories in India as well as in the world by providing orientation programmes to their users.

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Dr. Priya Rai, a Commonwealth Fellow with IALS, University of London, UK, is currently serving as Head, Justice T.P.S. Chawla Library, at National Law University Delhi since 2009. Dr. Rai have more than 20 years of practices of librarianship. She has earned Doctorate of Philosophy in Library and Information Science and carries LL.M. in Intellectual Property Rights. She has conferred with various international honors and awards. She is well known expert in the areas of Copyright, Licensing, Digital Rights Management, and Ethical Practices in Research.

Dr. Akash Singh, serving as Assistant Librarian with Justice T.P.S. Chawla Library, National Law University Delhi is a well-known expert in Open Access to Law Movement maintaining various OA web portals for academic community. Dr. Singh has earned Doctorate of Philosophy in Library and Information Science with LL.B. With more than 17 years of experience in librarianship, Dr. Singh assisted initiating various digital initiatives to serve academic, research and legislative communities.

Dr. Arjun is currently working with Rajiv Gandhi National University of Law, Punjab at Patiala. With more than 13 years of experience, Dr. Arjun manages two renowned journals viz. International Journal of Digital Library Services and International Journal of Information Sources and Service and a Chief Editor. Dr. Arjun has earned Doctorate of Philosophy in Library Sciences with Masters in Sociology. He has a vast experiences in the field of library automation, digitization, knowledge management and implementation of Information Technologies in Library and Information Services.

Mr. Shivjee Prasad is presently working with Chanakya National Law University, Patna, Bihar. With more than 12 years of experience in the field of library science, he has also served to Maurya TV, Head Office at Patna. Mr. Prasad has earned Master Degree in Sociology and UGC-NET in LISc. He has vast area of interest and experiences in various important fields like Digital Library, Web based Resources Management, Open Access Initiatives and Library Automation.

Dr. Vaibhav Bansal, serving as Secretary with M/s. Modern Rohini Education Society (MRES), Delhi under his leadership Modern Rohini Education Society hosted 1st Web Conference in 2015, since then we at MRES able to present our presence in Conferences (National and International), Dr. Vaibhav Bansal is having 17 years of vivid experience in various field like Teaching, Corporate Profile (HCL Infosystems Ltd., RT Outsourcing Ltd., Intravo, Bhoditree Technologies Ltd.), Business Profile and Implementer for various projects. As examiner NVQF he served for National Educational Frame Work, Currently he is the founder for Coceptive Technology and Stutikart, he is a instrument for setting up low cost effective print quality books under the banner M/s. Vidit Publication House.