



Need and Opportunities of Digital Preservation in Academic Libraries: an overview

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ABSTRACT

Growth of Information and Communication Technology, Web and Mobile technology have drastically changed the way of users' information access and their expectation of information resources. These technologies change and users' expectations and increasing e-publishing have completely changed the collection policy in the library. Technical advancement, high standard, user-friendliness and easy accessibility are the reasons for rapid increase of digital-only content in the library. Any loss in digital resources will affect the library service severely. So, it is very important to preserve the digital resources for a long term to serve the students and researchers efficiently. This paper discusses about digital preservation, need of digital preservation in academic library and also discusses various models and methods popularly used for digital preservation.

Key Words: E-Resources, Preservation, Digital Preservation, LOCKSS, PORTICO

Received 12.07.2015

Revised 29.08.2015

Accepted 12.10.2015

How to cite this article: V. Dhinesh K and P. Padma: Need and Opportunities of Digital Preservation in Academic Libraries: an overview. Inter. J. Edu. Res. Technol. 6[4] 2015; 13-17. DOI: 10.15515/ijert.0976-4089.6.4.1317

INTRODUCTION

Primary responsibility of any librarian is Collection, Organization and Dissemination of Information Resources. Apart from these three the most important responsibility of a librarian is the preservation of resources in the library in good, usable and accessible condition. Today's Libraries are having variety of materials, which can be called as information resources and it includes Printed Materials like Books, Periodicals, etc., Non Book Materials like CDs, DVDs, etc., and other electronic resources.

Advancement of ICT, Internet and Mobile technology have made possible for anyone to become an author and made publishing very easy on internet. The amount of Scholarly articles, Journals, Books and variety of content in digital format has grown exponentially and this increase of online digital content is reflected in the growing percentage of e-resources in academic libraries.

Presently librarian must have adequate knowledge about how to preserve the variety of library resources. Basically preservation means adapting appropriate and suitable measures and techniques to maintain the resources in good, usable and accessible condition.

Acquisition of a physical artifact like Printed materials and Non-Book materials automatically provides permanent possession of the materials in the library. But use of resources like E-Journals, E-Books, online databases, etc., which is accessible through internet, are governed by accessing rights (License) or contract, without acquiring ownership and these resources will not remain in the library. Different Standards, Strategies and Models are used in Digital Preservation.

GROWTH OF ONLINE RESOURCES IN LIBRARIES

Due to diversity of user needs, and expectations, 24x7 Access of Resources, Facility of Downloading, Printing and Exporting, Remote Access, Multiple user access at the same time, and Quick Search and Retrieval facilities are main reasons for increasing growth of online resources in libraries.

"Today with the introduction of information and communication technology the learning resource environment has changed a lot. Faculty, research scholars and students in university are moving towards flexible information resources. In this direction E-resources opened a new world for user community."¹

"Electronic resources are creating a revolution in engineering college libraries. Many librarians believe that these resources have changed the principles of selection radically"² (S. Sundareswari, 2013)

"E-books, which currently account for less than 5%, have seen a 50% growth in 2013, and are led by self-published titles, while online book selling platforms have expanded by some 20% between 2012 and 2013, and sales of printed books in bricks-and-mortar book stores declined by 1.19% in 2013."³ this report shows growth of E-books in publishing industry.

UGC-INFONET, INDEST and other Consortium are offering thousands of online journals and e-books at a low cost. These technologies change and users' expectations and increasing e-publishing have completely changed the collection policy in the library. Technical advancement, high standard, user-friendliness and easy accessibility are the reasons for rapid increase of digital-only content in the library.

Need for Digital Preservation:

Acquisition of Printed materials automatically provides permanent possession of materials but in case of e-resources or Digital Content, libraries do not actually 'receive' a copy of the digital content, instead libraries will have rights to access the resources i.e. license or contract to use the resources for a certain period. Libraries must have the necessary infrastructure to access the digital content for hosting a copy of all the digital content which they license.

In the field of e-journals libraries subscribe particular journal for a year. Libraries will get access rights to that journal for the subscription period, if it continues its subscription libraries will get the access rights for the current year and back issues, or libraries can get a copy of current year from publisher in a determined format, which can be downloaded to a local system for future use.

Perpetual Access:

The real problem arises, if a library stops subscribing a particular journal due to various reasons, libraries may lose its contents, and here this problem can be solved by signing a Perpetual Access agreement with the publisher.

Since Libraries do not have a ownership of the resources, they do not have a right to archive it without the authorization of the publisher, so libraries have to negotiate with the publisher and have to sign an agreement with publisher for proper perpetual access and archival rights.

Digital Library Federation (DLF) defines Perpetual Access designates the rights to permanently access the licensed materials paid for during the period of license agreement, while "Archival right" defines the right to permanently retain an electronic copy of licensed materials for preservation purposes.

Perpetual Access Agreement and Obtaining an archival copy is the primary and important step in digital preservation, but this is not a complete solution for digital preservation, CLIR (Council on Library and Information Resources) describes the complexity of the preservation process, "above all when standards and technologies are still as of insufficiently developed. In contrast with paper preservation...digital preservation requires active and constant maintenance"⁴

What will happen...?

1. If Publisher stop publishing a particular Journal.
2. If publishing company stops its business or goes out of its business.
3. If publishing company bought by some other company.

Library may lose its resources and will be left with nothing. To avoid this unwanted situation libraries have to take necessary steps to preserve its digital resources for a long term.

Digital Preservation:

Libraries need to be certain that the digital content they acquire today will not disappear when they cancel subscriptions, or under any other circumstance, and that their electronic collections can be preserved and accessed by readers far into the future.

Definition:

Encyclopedia of Information Technology defines the term digital preservation as "The process of maintaining, in a condition suitable for use, materials produced in digital formats. Problems of physical preservation are compounded by the obsolescence of computer equipment, software, and storage media. Also refers to the practice of digitizing materials originally produced in non digital formats (print, film, etc.) to prevent permanent loss due to deterioration of the physical medium."

"Digital preservation is the series of management policies and activities necessary to ensure the enduring usability, authenticity, discoverability and accessibility of content over the very long term (OCLC, 2002).

There are two types of preservation are there

1. Near and Mid-term access
2. Long Term Preservation.

Near and Mid Term Access is achieved by following types.

Backup

Backup, when content is copied and stored in multiple locations to create readily available data replacements in case of equipment failure or other loss of data, has long been understood to be a requirement for protection of near-term data access.

Access system redundancy

Many content delivery systems are configured for redundancy so that the entire system is running over two or more computers in two or more data centers. These multiple systems may be online at the same time, or one may be a 'hot spare' that can quickly be brought online should the first system fail.

Byte replication

Byte replication is a process whereby identical, multiple copies of files, file systems, or websites are created. They may be written to other online computers or to offline media. These replicas are typically held in diverse geographic locations and specialized software is not needed to access the content.

Long Term Digital Preservation:

Backup, Access system redundancy, and Byte replication are useful for Near and Mid-term access, but these are not sufficient for long term preservation of digital content. For long term digital preservation following necessary steps have to be taken.

To resolve this problem all the digital content can be placed in a separate place or organization called digital preservation organization apart from publisher and libraries. Such digital preservation organizations must have a technology infrastructure and capacity to support the digital content as it is created.

Digital Preservation Organization must obtain legal rights from the concerned publishers to preserve the digital content in advance.

TECHNICAL METHOD OF DIGITAL PRESERVATION

Migration:

Migration involves transforming digital content from its existing format to a different format that is usable and accessible on the technology in current use. That is the transferring of data to newer system environments (Garrett et. al., 1996). Transformation of one file format into another file format like conversion of files in text or word document to PDF, and transforming one operating system to another operating system like Windows to Linux, and from one programming language to another, etc.,

Emulation:

Emulation involves developing software that imitates earlier hardware and software. Emulation is a more technology-based strategy, requiring a deep understanding of existing hardware and software.

STANDARDS OF DIGITAL PRESERVATION

OAIS (Reference Model for an Open Archival Information System, ISO 14721: 2003). This reference model addresses a full range of archival information preservation functions including ingest, archival storage, data management, access, and dissemination. It also addresses the migration of digital information to new media and forms, the data models used to represent the information, the role of software in information preservation, and the exchange of digital information among archives.

PREMIS (Preservation Metadata: Implementation Strategies) – The PREMIS Data Dictionary for Preservation Metadata is the international standard for metadata to support the preservation of digital objects and ensure their long-term usability. Developed by an international team of experts, PREMIS is implemented in digital preservation projects around the world, and support for PREMIS is incorporated into a number of commercial and open-source digital preservation tools and systems. The PREMIS Editorial Committee coordinates revisions and implementation of the standard, which consists of the Data Dictionary, an XML schema, and supporting documentation.

TRAC (Trustworthy Repositories Audit & Certification: Criteria and Checklist) –These tools can help libraries, scholars, publishers, and others to judge the reliability of the repositories and digital preservation services. It was published by CRL in 2007. ISO 16363 / TDR - ISO 16363, or TDR, as it is more commonly referred to, is an ISO standard as of February of 2012. It is a revision of the TRAC Checklist. Many of the changes were structural, and it continues to address the same core areas

DRAMBORA (Digital Repository Audit Method Based on Risk Assessment) – Developed jointly by the Digital Curation Centre (DCC) and Digital Preservation Europe (DPE), the Digital Repository Audit Method Based on Risk Assessment (DRAMBORA) represents the main intellectual outcome of a period of pilot repository audits undertaken by the DCC throughout 2006 and 2007. It presents a methodology for self-assessment, encouraging organisations to establish a comprehensive self-awareness of their objectives,

activities and assets before identifying, assessing and managing the risks implicit within their organization.

Models of Digital Preservation:

- a. **Government Funded:** Libraries with national importance have taken steps to preserve their digital content, Examples of this type of Digital Preservation Organizations are British Library and National Library of Netherlands. The scope of the content and access terms vary in those libraries but those libraries are supported and funded by government.
- b. Libraries dealing with same type of subject and same type of content come together and form a digital preservation organization. Total Costs for preservation of digital content are shared by the participating libraries and Publishers. Examples for such organizations are PORTICO and The Inter University Consortium for Political and Social Research.
- c. Group of libraries form a network and put their resources into a preservation organization and share the preservation responsibility and costs involved in preservation. Examples for such organisations are LOCKSS (Lots of Copies Keeps Stuff Safe), CLOCKSS (Controlled LOCKSS), and NDIIPP (National Digital Information Infrastructure Preservation Program – the digital preservation program of the US Library of Congress)

LOCKSS

The LOCKSS Program is an open-source, library-led digital preservation system built on the principle that “lots of copies keep stuff safe.”

The LOCKSS Program is a library-led program initiated in 1999 at the Stanford University Libraries in order to support the library community in an increasingly digital age with an inexpensive, technologically robust way to safeguard and control its digital assets.

The LOCKSS system allows librarians at each institution to take custody of and preserve access to the e-content to which they subscribe, restoring the print purchase model with which librarians are familiar. Using their computers and network connections, librarians can obtain, preserve and provide access to purchased copies of e-content.

The publisher permits the LOCKSS system to collect, preserve and provides access to the content by putting online a LOCKSS permission statement and a LOCKSS manifest. A library uses the LOCKSS software to turn a mid-range PC, or the hardware equivalent, into a digital preservation appliance called a LOCKSS Box.

When the publisher’s web site is unavailable for any reason, content is served from the library’s “LOCKSS Box,” guaranteeing immediate and continuous user access. LOCKSS delivers a copy of the original publication to authorized users in real time, whenever it is needed. Because LOCKSS preserves the original publisher’s copy of each item, it ensures that the most authoritative version persists, unchanged, with full credit to the publisher.

Preservation requires three actions:

- i. A publisher to give permission for the target content to be preserved;
- ii. For a library to bring online a LOCKSS box that has authorized access to the content;
- iii. LOCKSS box to be registered with one associated LOCKSS Alliance networks.

The LOCKSS Program has received major funding from:

1. Andrew W. Mellon Foundation
2. National Science Foundation
3. Library of Congress

PORTICO

Portico is a not-for-profit organization with a mission to preserve scholarly literature published in electronic form and to ensure that these materials remain available to future generations of scholars, researchers, and students. With support from JSTOR, Ithaka, The Andrew W. Mellon Foundation, and the Library of Congress, Portico was officially launched in 2005 with an initial focus on e-journal preservation.

Portico preserves content through a format-based migration strategy. The key points of this strategy are identifying key preservation metadata at the initial point of preservation practical preservation of content, such that the content is only migrated at the point where it becomes necessary.

In the case of major natural disaster or business failure, the Portico archive could be moved to new stewardship with ease. And, while the archive is dark, publishers and libraries are provided with audit privileges that allow them to review the status of content.

DIGITAL PRESERVATION IN INDIA

Many consortia are successfully run by different organizations in India to increase the purchasing capacity of the libraries, to expand the resource availability and to offer automated services. Most commonly used consortia are INDEST, UGC-INFONET, CSIR, FORSA, etc.,

“The Consortia, as it is obvious, have an edge over individual libraries. They should provide a safety net for all the online journals and databases which they subscribe. This clause can be incorporated in the license agreement which they sign with publishers.”(Gaur 2012).

AICTE INDEST consortia have more than 1200 institutions and offer more than 12000 e-journals. UGC-INFONET consortia have more than 400 institutions and offer more than 7500 journals and numerous databases to their member institutions. If we take other consortia into consideration, thousands of Institutions are participating in this consortium, this consortium may take important steps in digital preservation in India. They may initiate to create a new model which is suitable for their member Institutions. This will help the thousands of institutions to preserve their digital content for future use.

CONCLUSION

The researchers, users and even general public are moving rapidly towards using digital content. World is witnessing exponential growth of digital content in World Wide Web. This precious knowledge must be preserved for future. Libraries and publishers are the two key groups of participants in the Digital preservation service, so they have to join together to find the suitable digital preservation service. Single library cannot achieve this, so government and other leading organizations have to initiate and support the process of digital preservation. And most importantly this is an ongoing, long term process to Long Term Digital Preservation which can be achieved by cooperatively sharing responsibility and costs involved in Digital Preservation.

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