

Digital Preservation of Information Resources in Academic Libraries: Benefits, Challenges and Strategies

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ABSTRACT

The changing roles played by computers and digital information devices bring opportunities for digital preservations in academic libraries. Digital preservation is a computerized system of preservation of information resources in digital libraries. Digital preservation encompasses a broad range of activities and strategies designed to extend the usable life of machine readable computer files. This paper covers the digital preservation of information resources in academic libraries. The paper investigates the concepts of digital preservation, information resources as well as concepts of academic libraries. The paper also discusses the requirements for digital preservation. The paper examines the digital preservation strategies and also highlights some of the benefits in digital preservation which include multi access and sharing of resources, long term access effective and quality control. The paper further ascertain the challenges that affect digital preservations in academic libraries which include obsolescence in the terms of continuous technology migration, lack of legislation policy, strategy and awareness, poor collaboration and partnership, deterioration of the digital media, disaster planning and recovery, as well as the strategies for enhancing digital preservation of information resources in academic libraries.

Keywords: Digital Preservation, Information Resources and Academic Libraries.

Introduction

Digital technologies have continued to reshapes the face of information practice in the library and information profession. Digital preservation became a modern way of preservation, retrieval and dissemination of digital information resources in academic libraries. Digital preservation is the process of involving information technology in preserving information resources to safeguard them against deterioration. Digital preservation of information materials in academic libraries is a critical activity practiced among academic librarians that guaranties long term accessibility, integrity and usability of digital content of information resources in academic libraries. The tradition of this digital age relies on digital contents such as electronic books, electronic journals, digitized manuscripts and other multimedia resources such as audio

visual materials. Aina (2004) stated that academic libraries are libraries that are attached to post-secondary institutions. Academic libraries are therefore as varied and distinctive as the institutions they serve and their purpose.

The purpose of establishing academic libraries is to support the objectives of the institutions, in the area of learning, teaching, research and other functions. Ifidon (2009) opined that part of the purposes of academic libraries includes: provision of information resources for undergraduate instruction, term papers and project as well as for supplementary reading, provision of information resources in support of faculty, external and collaborating researchers, provision of information resources in support of post-graduate research, provision of expensive standard work especially in the professional disciplines, provision of information resources for personal self-development, provision of specialized

information on the region within which the university is situated, among others.

Moreover, the prime aim of academic libraries in Nigeria is to facilitate academic success. To meet their objectives, academic libraries must provide access to a broad range of information resources. Reference and referral services, orientation activities, and instruction sessions that teach students the critical thinking skills necessary for using library information resources are among one of the basic services provided by the library staff particularly to new students of academic institutions in Nigeria. Varied and innovative orientation programs to new users of the library include teaching by personal contact and through the preparation and use of instructional information resources in various formats. Introducing the library users to the library activities, provides a gateway to all future inquiries, not only preparing the users as independent users but also teaching them to use information sources as citizens, as consumers, as professionals, and for recreational purposes.

Furthermore, Ifidon and Ifidon (2009) postulated that the services rendered by academic libraries in Nigeria include circulation / borrowing services seen as one of the most vital services rendered to clientele. These services are provided for the teeming population of users which constitute students, staff and other potential patrons outside the academic environment such as the communities' members where the library is situated. Meanwhile, effective academic library services involve the utilization of the available resources in such libraries including books and non-books materials by the information users.

Literature Review

Academic Libraries

Academic libraries are libraries that exist in the tertiary institutions of learning such as universities, polytechnics, and colleges of educations. to provide and sustain the information needs for academic and non-academic staff, students and researchers.

Meanwhile, academic libraries support the mission and vision of their parent institutions. It is a library attached to a higher educational institution to support teaching, learning and research activities. However, academic libraries are categorized based on the type of institution in which they exists such as: university libraries exist in the university environment, polytechnic libraries exist in polytechnics, and college libraries exist in colleges. Omekwu (2019), further postulated that an academic library is a library that is attached, domiciled or situated in an institution of higher learning which serves two complimentary purposes: to support the school's curriculum, and to support the research of the university faculty and students. Dickson and Robert, (2010) highlighted some of libraries services in an attempt to determine their acceptance in the service context of academic libraries in digital format. These services include instant messaging, streaming media, weblogs, tags and social networks. However, to achieve these, the integration of the conventional library services with the digital information resources plays a vital role. The advent of information and communication technology (ICTs) changed the management and administrative structures of library services and resources. This lead to most of the academic libraries hybridizing their services. Academic libraries have great opportunities in digital preservation of information resources.

Information Resources

Information resources, are those information materials or information carries. They are broadly categorized into print and non-print resources. The computerized resources are also referred to as electronic or digital information resources. According to Shariful (2012) electronic information resources (EIRs) are those resources that deal with both born electronic and digitized materials which can be either accessible from library's in house database or from the world-wide-web. The born electronic materials includes: e-books, e-journal, e-newspaper, e-magazine, e-projects, e-thesis, e-dissertations, e-reports, website, www-resources and other related materials. With the presence of digital information resources library services are becoming digital in nature entailing that

libraries are able to offer digital information services.

On the other hand, digitalization of materials means converting the materials from other formats into digital format. Digital resources include electronics records, web contents, audio and visual files. To achieve a successful digital preservation in academic library, information resources must be in digital format, either born digital or converted into digital format through digitization. Musa (2019) outline the following types of born digital materials: digital photographs, digital picture is one of the most available born digital content globally. Preserving digital images require taking cognizance of issues such as compression, space, and colour as they may affect the quality of the images. "Born digital" objects which have been released for public access and either made available or distributed free of charge or for a fee. They may consist of network publications, available over a communications network or physical format publications which are distributed on formats such as floppy or optical disks. They may also be either static or dynamic; internet archive. This captures snapshots of the web; harvested web content, is a more detailed and focused archiving of web pages of a particular entity or subject area. For example, archiving the web sites of a particular state or county; digital manuscripts, Individual personal manuscripts that are created digitally are regarded as born-digital manuscripts, and they require systematic planning for their preservation; electronic records. This category includes government documents and corporate, institutional, and organizational archives. This type of collection might consist mostly of documents in word processing formats or may include an array of e-mail, databases, spreadsheets, presentations, and other types of files, some of which can only be read using proprietary software.

Digital Preservation

Digital Preservation encompasses a broad range of activities designed to extend the usable life of machine readable computer files and protects them from media failure, data decay, physical loss and obsolescence. Digital preservation refers to the set of activities, processes, skills and strategies used to ensure the long term accessibility and usability of

digital contents. (Idris, 2022). The digital environment is real in 21st century. Individuals, particularly, the digital natives are familiar and relaxed in an online ecosystem for information access, information seeking, and information sharing. (Musa, 2019). Nevertheless, digital preservation refers to preservation of information in digital format, either born digital or digitized. Born digital refers to information resources that are generated electronically at the point of creation. This is different from digitized information resources that are converted from hard copy paper format into digital medium. In other words, born digital resources are items created and managed in digital form. (Erway, 2010). Digital preservation aims at safeguarding and making digital content available for use.

Digitization requirements: Wide format scanner which can scan document width up to 42 inches; Digital Cameras, Scanners 8.5x14, 8.5x11.5, Book scanners with V shaped cradle, Dark rooms with lighting equipment, Servers: IBM server with an installed storage of 20TB Backup equipment: LTOP Tap drives, hard drivers, DVD writers, computers: desktop and laptops.

Ravat, and etal (2021) highlighted some of the requirements for digitization which include:

Wide format scanner (8.5" * 14 or 8.5" * 11.5) Book scanner with V shaped cradle dark rooms with lighting servers with high storage capacity, backup equipment's like; tap drives, hard drivers, DVD writers, cloud and virtual space computers, Hard ware and Software standards for Architecture: ISO/DIS 15489, AS 4390, DOD 5015.2 STD, OAIS standards for digital Content: PDF, XML, Dublin core, MARC, Z39.50; standards for interoperability: ODMA, DMA, Co-ordinations. Standards for Preservation content, standards for preservation content should be depending upon ageing process of the semantic and physical recoverability of the document that is being preserved. A standard can only provide such longevity when the standard itself does not change and backward compatibility is provides. More often XML and PDF are put forward as two rivals to preserve a document for long term

preservation. PDF (Portable Document Format): PDF is the de facto document standard and is the proprietary of Adobe. It uses the image model of the post script language in order to depict text and image as exact copies of the original. The PDF has two types of format. Text based PDF outline font technology of postscript PDL (Page Description Language) for describe format of a page and Raster scanned image PDI without text outline font OCR (Optical Character Recognition) XML (extensible Mark-up Language): XML is subset of the standard SGML (Standard General Markup Language) and is related to the Web language HTML Hypertext Markup Language (XML, 2001). With the help of the XML the structure of a document can be saved in a specific type document so called Document Type Description (DTD). For the specification of the form of document style sheet can be used. Cascading style sheet (CSS), extensible style sheet language (XSL) or XSL transformation (XSLT) can be used.

Standards for Preservation Access,

Preservation of the bit stream of the document in some standard format is not enough to preserve a digital document over an indefinite period of the time, so it is necessary for the description of the digital, object or various parts into one object means file/formats stored in different physical places in the information system and linked by cross reference. Such types of description are called metadata which included the contextual information to manage, retrieve and interpret the electronic information overtime.

Dublin Core: The Dublin core has especially been developed for cross disciplinary network discovery. It exists upon 15 elements (i.e. Title, Creator, Subject, Description, Publisher, Contributor, Date, Type, Format, Identifier, Source, Language, Relation, Coverage and Rights) for resources description and discovery. MARC defines the representation and communication of bibliographic and relation definition in machine readable forms. Machine records contain a guide to its data. Z39.50: Z39.50 is an ANSI/NISO standard for information storage and retrieval under supervision of the Z39.50. Maintenance Agency (Library of Congress) of Z39.50 and its possible successor

ISO Z39.50 is protocols which specifies data structure and enable searching or interchanging bibliographic information on different platform in a distributed environment.

Standards for Interoperability:

Interoperability is the ability of multiple systems with different hardware or software platform, data structure and interface to exchange data with minimum loss of content and functionality. Therefore interoperability is a critical problem in the networked environment with increase in diverse computer systems software application, file formats, information and users. But it is important for digital preservation in digital library and archives. ODMA (Open Document Management API): The open document management API enables integration of proprietary document application into ODMA compliant document management system. Now many document management software packages are already ODMA complaint. DMA (Document Management Alliance): the DMA is a comprehensive standard for interoperability among electronic document management systems (EDMSs). The Document. Management Alliance tries to solve the problem of island of information that created different proprietary DMSs (Document Management Software) (Lakshminarasimhappa, and Veena, 2014)

Benefits Of Digital Preservation in Academic Libraries

Remote Access/ expand access: Connecting people globally by providing continued free online access, Multiple Accesses: One of the most important advantages of digitization is multiple access documents. If a manuscript is in physical format, then it can be handled by only one person in the specific period, but through the digitization process, several users can access the specified document at a time. Preservation and Conservation: Addressing heritage loss due to environment, ignorance, and destruction. Dissemination and Promotion: Saving invaluable treasure to enrich the present and enlighten the future. Dissemination of knowledge and culture via the internet is a 21st century phenomenon. Unlimited access time to digital information 24/7, Adaptation to emerging technologies, Emergency

preparedness, Support for multimedia and interactive content, facilitates collaboration and resources sharing, cost effect storage and preservation. (Lakshminarasimhappa and Veena, 2014, and Musa, 2019)

Challenges affecting digital preservation

Hazarika, (2020) point out the following challenges affecting digital preservation in academic libraries: technological obsolescence in the terms of technology continuous migration, lack of legislative policy, strategy and awareness, poor collaboration and partnership, deterioration of the digital media and disaster planning and recovery. Inadequate local digital contents, (Idris M. 2022)

Strategies for the enhancements of effective digital information preservation in academic libraries

Pal and Musa, (2019) postulated the following strategies for enhancing digital preservation: Software selection, libraries evaluate and select the suitable software tools and systems for digital preservation. Resources assessment, these involve evaluation and assessment of information materials. Format identification and conversion, experts should identify the file format of digital resource, strategic storage and backup. Migration and emulation possibility, data migration involves change in the configuration of the underlying data, without change in the intellectual content. The purpose of migration in to preserve the integrity of digital objects and to retain the ability for clients to retrieve, display and otherwise use them in the face of constantly changing technology Documentation and preservation policy and continue monitoring and adaptation consideration. Technology Preservation, this strategy aims at preserving the software and hardware environment that are used to access the resources when it was created. This approach may be the best solution for some digital objects in the short term but not in the longer term.

Conclusion

This paper explored digital preservation of information resources in academic libraries. The study also investigated the benefits, challenges and the strategies for enhancing digital preservation of information in academic libraries. Digital preservation is a

paradigm shift of conventional preservation of information in this digital age. This innovation facilitates preservation, access, retrieval and dissemination of information in the global world of knowledge.

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