

**DIGITAL PRESERVATION STRATEGIES FOR LONG-TIME ACCESS TO INFORMATION IN
FEDERAL UNIVERSITY LIBRARY GASHUA YOBE, STATE NIGERIA**

BY

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Abstract

This study focused on exploring various digital preservation strategies implemented by university libraries to ensure long-time access to information in Federal University Library Gashua, Yobe State, Nigeria. Three research questions were raised in line with the specific purposes that guided the study. A descriptive survey research design was used for the study. The entire population of the study was 24 librarians from Federal University library Gashua. The questionnaire titled digital preservation strategies for long-time access information resources (DIPSAIUL). Which contains 21 items statements. The responses of the librarian were used to answer the research questions. The instrument was structured on 5-point scale” The instruments were face validated by three experts, two experts from department of Library and Information Science and one from Measurement and Evaluation Unit, Department of Science Education, Federal University Gashua. Data was collected with the help of two briefed research assistance, the instrument was administered and retrieved within two weeks. The returned rate of the administered questionnaire was 100%. Data collected for the study were analyzed using Mean and Standard Deviation (SD). This was done using Statistical Package for Social Sciences (SPSS) version 21. The findings of this study revealed different method employed in preservation strategies for digital information resource in Federal University Library Gashua, challenges, and measures. The findings of the research shed light on several important aspect of digital preservation in this context for effective service delivery. The findings of this study recommendation were made which include: library staff should be expert on how to manage and preserve digital resources because of the emerging technologies.

Keywords: Digital, Preservation, Preservation Strategies, information and University Libraries

Introduction

Digital preservation strategies in university libraries are crucial to safeguard and maintain the long-term accessibility and integrity of digital materials. Strategies employed for effective digital preservation. Wilson (2017) defined digital preservation strategies are data management planning, in university libraries which should establish comprehensive data management plans that outline the organization's goals, policies, and procedures for preserving digital content. This includes defining roles and responsibilities, establishing selection criteria for materials, and identifying technical requirements for storage and accessibility. According to Da Silva, Junior and Borges (2017) digital preservation strategies is Migration and emulation to periodically migrate digital content from obsolete or deteriorating formats to more sustainable formats. Emulation involves using software or hardware to simulate older systems, allowing access to content in its original environment. Matusiak (2017) refer digital preservation strategies of information as backup and redundancy implementing robust backup systems is essential to ensure that digital content is safeguarded against accidental deletion, hardware failure, or other forms of data loss. Redundancy, such as maintaining multiple copies of the data in different locations, adds an extra layer of protection.

Therefore Rosenthal, (2015), seen digital preservation strategies as Metadata and documentation Proper metadata and documentation practices contribute to the accurate identification, description, and management of digital

materials. Metadata provides critical information about the content, allowing for efficient search, retrieval, and preservation activities. According to Dolan (2014) digital preservation strategies of information is digital rights management system Since university libraries often acquire copyrighted digital materials, implementing digital rights management (DRM) strategies is necessary. DRM helps manage access and usage rights to protect intellectual property while ensuring appropriate access for authorized users. While Digital library resources refer to the collection of information and materials that are stored, organized, and made accessible in digital formats within a library or educational institution. These resources encompass a wide range of materials, including books, journals, articles, research papers, audiovisual content, archival documents, and more.

Purpose of the Study

1. This work is to determine the Digital preservation Strategies for long-time access to Information in Gashua Federal University Library
2. Find out the challenges affecting Digital preservation Strategies for long-time access to Information in Gashua Federal University Library
3. Determine measures for enhancing the digital preservation strategies for long-time access to information in Gashua Federal University Library

Research Questions

To quid this study, the researchers posted the following question:

1. What is the digital preservation strategies for long-time access to information in Gashua Federal University Library?
2. What is the challenges affecting Digital preservation Strategies for long-time access Information in Gashua federal university Library?
3. What is the measures for enhancing the digital preservation strategies for long-time access information in Gashua Federal University Library?

Literature Review

Digital can take various forms, such as text documents, images, videos, audio files, and more. Unlike analog information, which is continuous and requires physical means to capture and reproduce, digital information is represented by discrete units called bits or bytes. To convert analog information into digital form, a process called digitization is used. This involves sampling the analog signal at regular intervals and converting the measurements into numerical values. These values are then stored as digital data, which can be easily manipulated and accessed by computers and other digital devices (Becker, 2014). According to Bishoff (2015) one of the key advantages of digital information resources is its ability to be easily replicated without any loss in quality. This means that digital data can be copied and distributed effortlessly, leading to the widespread availability of digital content over the internet. Additionally, digital information can be easily manipulated and processed using algorithms and software applications. This enables various functions like editing, analyzing, searching, and organizing digital data, providing a wide range of possibilities for information management and utilization.

Overall, the digitization of information has revolutionized the way we store, transmit, and access data, leading to significant advancements in fields such as communication, entertainment, research, and commerce. In Object Management (2010), While Preservation is the act of protecting and maintaining something in its original or desired state, ensuring its longevity and availability for future use or appreciation. It is a broad concept that applies to various domains, including historical artifacts, natural resources, cultural heritage, artworks, and digital content. In the context of historical artifacts, preservation involves techniques and practices to prevent deterioration and damage caused by environmental factors, such as light, humidity, temperature, pests, and pollutants. McMillan (2011) Preservation efforts aim to stabilize and conserve these objects, ensuring their physical integrity and preventing irreversible decay. Natural resource preservation focuses on safeguarding ecosystems, biodiversity, and habitats. Conservation initiatives involve protecting endangered species, managing

natural resources sustainably, and maintaining the ecological balance. This helps preserve the planet's natural heritage for future generations

Preservation strategies for digital information resources refer to the proactive measures and approaches taken to safeguard and maintain the integrity, accessibility, and longevity of digital resources and information. Noonan (2014) in the context of digital preservation, the following strategies are commonly employed: Data backup: Regular and systematic backup of digital data is essential to ensure its preservation. This involves creating copies of files and storing them in multiple locations, preferably on different media types or in multiple data centers (Gbaje, 2010). Data migration as digital storage technologies evolve and become obsolete, it is necessary to periodically migrate data to newer systems or formats. This prevents data loss due to media degradation or incompatibility with future technologies. Data integrity checks: Verification mechanisms, such as checksums or cryptographic hashes, are employed to ensure the integrity of digital data. Regular checks allow for the detection of any data corruption or alterations, aiding in the timely correction and preservation of the original information. Metadata management: Accurate and comprehensive metadata, including descriptive, administrative, and technical information, is crucial for the effective management and retrieval of digital resources. Establishing standardized metadata schemas and ensuring their consistent application enhance the discoverability and preservation of digital content Emulation and virtualization.

According to the Gilber (2013) preservation strategies involves Emulation creating software environments that replicate the functionality of obsolete hardware or software systems, allowing for the access and use of digital content that might otherwise be inaccessible. It is important to note that preservation strategies should be implemented in conjunction with policies, guidelines, and best practices specific to each organization or institution. Regular review and evaluation of these strategies also help to ensure their effectiveness in the ever-changing digital landscape because library information resources need to be preserved (Kari, 2016). Digital information resources have become increasingly prevalent in university libraries, revolutionizing the way students, faculty, and researcher's access and utilize information. These resources include a wide range of electronic materials that can be accessed and used online. One of the primary digital information resources in university libraries is electronic databases. These databases contain vast collections of scholarly articles, research papers, and other academic resources from various disciplines. Jackson, (2011) they cover a wide range of topics, allowing users to search for specific keywords or subject areas and retrieve relevant articles instantly. Examples of electronic databases often found in university libraries include JSTOR, ProQuest, and EBSCOhost. E-books are another important digital resource available in university libraries. These are electronic versions of printed books that can be accessed and read on computers, tablets, or e-book readers. University libraries often provide access to e-books on a variety of subjects, allowing users to borrow and read entire books or specific chapters without the need for physical copies. This offers students and researchers greater flexibility and convenience in their studies and research.

University libraries may subscribe to electronic journals (e-journals) that are accessible online. These journals publish scholarly articles, research findings, and academic papers in specific fields. Accessing e-journals provides researchers with the latest publications in their field of study, without the constraints of limited physical copies (Dressler, 2017). Many university libraries also maintain institutional repositories, which are digital collections of research outputs produced by faculty and students. These repositories host a variety of materials, including research papers, theses, dissertations, conference proceedings, and reports. Institutional repositories make it easier for researchers to share their work, increase their visibility, and contribute to the academic community. Furthermore, Baro (2014) university libraries may offer access to multimedia resources in digital format. These resources can include audio recordings, video lectures, slideshows, and interactive educational materials. Such resources enhance the learning experience and provide different formats for understanding complex concepts. To access these digital information resources, university library users often need an institutional login or authentication. Once authenticated, users can search the library's online catalog or database offerings, browse e-book collections, access e-journals, and utilize various online research tools.

University librarians play a crucial role in assisting users with digital information resources. They can provide guidance on effectively searching electronic databases, selecting appropriate e-books or e-journals, and utilizing specialized tools and features available in digital platforms. Librarians are also available to answer questions, provide research support, and offer training or workshops on using digital resources effectively. Raju (2014) Digital information resources in university libraries encompass electronic databases, e-books, e-journals, institutional repositories, and multimedia materials. These resources expand access to information, facilitate research and learning, and provide opportunities for collaboration and knowledge sharing in digital formats. According to Nok (2006) University libraries are specialized libraries that are typically found on college or university campuses. These libraries cater specifically to the needs of students, faculty, and researchers affiliated with the institution. They play a vital role in supporting the academic mission of the university by providing a wide range of resources and services. One of the primary functions of a university library is to collect and maintain a comprehensive collection of books, journals, periodicals, and other scholarly materials relevant to the various academic disciplines taught at the university. These collections are carefully curated and continually updated to ensure they align with the educational and research needs of the university community. In addition to physical collections, Singh, (2009) university libraries have embraced digital technologies, offering access to a vast array of electronic resources. These may include e-books, electronic journals, databases, and multimedia content, which can be accessed remotely by students and faculty, enabling them to carry out research from anywhere at any time.

University libraries often have specialized subject librarians who are experts in specific disciplines. These librarians provide personalized assistance to students and faculty, offering guidance in navigating the library's resources, conducting research, and locating relevant information for their projects and studies. Ugah (2011) the unit that is responsible for managing and preserving digital information resources in university libraries is commonly known as the Digital Services or Digital Initiatives department. This department not only manages the acquisition and organization of digital resources such as e-books, academic articles, and multimedia materials, but also ensures their long-term preservation and accessibility for library patrons and researchers. The Digital Services team plays a crucial role in maintaining the digital infrastructure, implementing metadata and cataloging standards, digitizing print materials, managing licensed databases, and collaborating with publishers and vendors to provide seamless access to digital resources. Additionally, they may also develop platforms and tools for researchers to access, search, and interact with the digital collections, often working closely with other library departments such as Archives, Reference, and Special Collections. The goal of the digital services unit is to ensure that the university library remains a valuable hub for accessing and utilizing digital information resources in support of teaching, learning, and research endeavours (Armuta, 2018).

Universities library typically have rules and regulations in place to govern the use and access of digital information in the libraries. These guidelines aim to ensure that all users can effectively and responsibly utilize the digital resources available. While specific regulations may vary among institutions, Singh (2009) digital preservation of information resources for long time access there is need for specific rules and regulation Valid Library Membership: Users are usually required to hold a valid library membership, which may be obtained through enrollment or registration with the university. This ensures that only authorized individuals have access to the digital resources. Acceptable Use Policy: Universities typically enforce an acceptable use policy that outlines the proper and responsible use of digital resources. According to Yetunde (2008) state the policy use of digital department in university library, include guidelines on appropriate conduct, respecting copyright laws, and refraining from any unauthorized access or use of digital materials. Access Restrictions: Certain digital resources may have access restrictions based on licensing agreements or copyright limitations. Users may be required to comply with any limitations on the number of simultaneous users, downloading restrictions, or restrictions on sharing and distributing materials. Personal Account.

According to John-okeke (2010) Users may be required to create a personal account to access and utilize digital resources. This account helps in tracking usage, managing borrowing privileges, and ensuring authorized access to licensed content. User Obligations: Users are typically expected to respect the terms and conditions set forth by publishers and vendors, including restrictions on downloading, reproduction, and sharing of copyrighted materials. Proper attribution and citation may also be expected when using or referencing digital resources. Prohibited Activities: Users are usually prohibited from engaging in activities such as hacking, tampering with library systems, or attempting unauthorized access to restricted content. Engaging in any form of plagiarism or copyright infringement is also strictly prohibited. Privacy and Data Protection: Universities often have policies in place to protect user privacy and data. Users may be assured that their personal information and browsing activities are kept confidential and that the library employs appropriate data protection measures. These rules and regulations are put in place to protect the rights of content creators, uphold ethical standards, promote responsible use of resources, and maintain the integrity of the digital collections within university libraries. It is important for users to familiarize themselves with these guidelines to ensure compliance and make the most effective use of the digital information available (Amughoro, Makgahlela and Bopapen, 2014).

Methodology

Descriptive survey was adopted for the study. According to Nwago (2015) descriptive survey is a type of study which aims at collecting data and describing in a systematic manner, the characteristic feature or fact about a giving population. The study was carried out in Gashua Federal University Library Yobe State, the population of this study is 24 which comprised male and female staff working in Gashua Federal University Library. (Sources statistic staff book of record). There is no sample size of the study because the population is manageable the staff, made up of 21 male and 3 female staff from all department. Or (unit) Digital library, Circulation, Collection development and Serial unit. The study used questionnaires as data collection instruments. Respectively two librarian staff were used as research assistants the average ratings of the statistic were then subjected to the appropriates statistic- mean and standard deviation SD, employed in answering the research question Decision on mean was based on benchmark of 3.5 and above for A which mean Accepted or good and bellow is R which mean rejected for poor. DC is decision making for digital preservation strategies.

Results

Research Question 1: What is the digital preservation strategies for long-time access information in Federal University Library Gashua?

Table 1: Mean and Standard Deviation of Respondent on Digital preservation strategies for long-time Access information in Federal University Library Gashua

S/N	Item Statements	SD	D	UD	A	SA	N	Mean	STD	DC
1.	Are backup and redundancy method of digital preservation strategies	2	1	2	13	6	24	3.85	1.12	A
2.	Are regular monitoring and assessment digital preservation strategies	4	4	10	-	6	24	3.75	1.03	A
3.	Digitization of information resources	-	2	3	11	8	24	4.04	3.09	A
4.	Collaboration and standard compliance	1	-	10	13	-	24	3.46	0.72	A
5.	Data management plan for digital preservation strategies	-	1	-	23	-	24	3.96	0.20	A
6.	Migration and emulation are digital preservation strategies for information resources	-	-	1	10	13	24	4.50	0.34	A
7.	Metadata standard are method for digital preservation strategies for information resources	-	1	2	17	4	24	4.00	0.65	A

Grand Mean	4.84	0.65
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Keys: *SD=Strongly Disagree, D=Disagree, UD=Undecided, A=Agree, SA=Strongly Agree*

Table 1 present the digital preservation strategies for long-time access information in Federal University Library Gashua to backup and redundancy had mean score 3.85 and standard deviation 1.12, regular monitoring and assessment digital preservation strategies hard mean score 3.75 and standard deviation 1.03. Digitization of information resources hard mean score 4.04 and standard deviation 3.09, Collaboration and standard compliance hard mean score 3.46 and standard deviation 0.72, Data management plan for digital preservation strategies hard mean score 3.96 and standard deviation 0.20, Migration and emulation are digital preservation strategies for information resources hard mean score 4.50 and standard deviation 0.34, Metadata standard are method for digital preservation strategies for information resources hard mean score 4.00 and standard deviation 0.6.the grand mean score 4.84 hard the corresponding standard deviation of 0.65 is greater than the criterion mean of 3.5 this implies that the respondent agreed had the item 1-7 as the digital preservation strategies for long-time access information.

Research Question 2: what is the challenges affecting digital preservation Strategies for long-time access Information in Federal University Library Gashua?

Table 2: Mean and Standard Deviation of Respondent on challenges affecting with Digital preservation strategies for long-time Access information resources in Federal University Library Gashua

S/N	Item Statements	SD	D	UD	A	SA	N	Mean	STD	DC
1	Technology obsolescence	2	2	8	10	2	24	3.38	1.04	A
2	Data integrity	-	1	4	7	12	24	4.25	0.89	A
3	Lack of storage and infrastructure	-	-	3	13	8	24	4.21	0.65	A
4	Financial and resources constraint	-	3	4	16	1	24	3.63	0.77	A
5	Appropriate file and format and standard	-	3	5	14	2	24	3.63	0.82	A
6	Staffing with technical knowhow	-	-	8	14	2	24	3.75	0.60	A
7	Metadata and documentation	-	1	6	12	5	24	3.88	0.79	A
Grand Mean								3.81	0.80	

Keys: *SD=Strongly Disagree, D=Disagree, UD=Undecided, A=Agree, SA=Strongly Agree*

Table 2 Presents the challenges associated with Digital preservation strategies for long-time Access information. Technology obsolescence had mean score 3.38 and standard deviation 1.04. Data integrity had mean score 4.25 and standard deviation 0.89, Lack of storage and infrastructure had mean score 4.21 and standard deviation 0.65, Financial and resources constraint had mean score 3.63 and standard deviation 0.77, Appropriate file and format and standard had mean score 3.63 and standard deviation 0.82, Staffing with technical knowhow had mean score 3.75 and standard deviation 0.60, Metadata and documentation had mean score 3.88 and standard deviation 0.79 the grand mean score 3.81. Had the corresponding standard deviation of 0.80 is greater than the criterion mean of 3.5. This show that the responded agree on item 1-7 as the challenges associated with digital preservation strategies.

Research Question 3: What is the measures for enhancing the digital preservation strategies for long-time access information in Federal University Library Gashua?

Table 3: Mean and standard deviation of respondent on the measures for enhancing the digital preservation strategies for long-time access information in Federal University Library Gashua.

S/N	Item Statements	SD	D	UD	A	SA	N	Mean	STD	DC
1	Cloud storage	-	1	1	11	11	24	4.33	0.76	A
2	Digitization project	-	-	3	10	11	24	4.33	0.70	A
3	Metadata management	-	-	4	15	5	24	4.04	0.61	A
4	User authentication and access	-	-	5	15	4	24	3.96	0.62	A

	control								
5	Digital preservation system	-	1	2	16	5	24	4.04	0.69 A
6	Collaboration and partnership	-	1	2	16	5	24	4.04	0.69 A
7	Continuous evaluation and updates	-	-	-	13	11	24	4.46	0.50 A
	Grand Mean							4.616	0.659

Keys: SD=Strongly Disagree, D=Disagree, UD=Undecided, A=Agree, SA=Strongly Agree

Table 3 Measures for enhancing the digital preservation strategies for long-time access information. Cloud storage had mean score 4.33 and standard deviation 0.76, Digitization project had mean score 4.33 and standard deviation 0.70, Metadata management had mean score 4.04 and standard deviation 0.61, User authentication and access control had mean score 3.96 and standard deviation 0.62, Digital preservation system had mean score 4.04 and standard deviation 0.69, Collaboration and partnership had mean score 4.04 and standard deviation 0.69, Continuous evaluation and updates had mean score 4.46 and standard deviation 0.50. The grand mean score 4.61 had the corresponding standard deviation 0.65 is greater than the criterion mean of 3.5, this shows that respondents agree on item 1-7 as solution to the problems associated with digital preservation strategies for long-time access information resources in Federal University Library Gashua.

Discussion of finding

Findings of the study from research question one revealed that migration and elimination are the digital preservation strategic for information resources that has the highest score of mean score of 4.50 followed by metadata standard method for digital preservation strategies for information resources with 4.0. They were then followed by digitization of information resources, data management plan for preservation strategies, collaboration and standards compliance among others. The findings is in line with the findings of Armuta (2018) who stated that the goal of the digital services unit is to ensure that the university library remains a valuable hub for accessing and utilizing digital information resources in support of teaching, learning, and research endeavours.

From the findings of the study on the challenges the respondents agreed that data integrity has mean score highest followed by lack of storage and insfastructures then technology obsolescence, financial and resources constrains and staffing with technical knowhow. The findings agree with the findings of Noonan (2014) who reported that in the context of digital preservation, the following strategies are commonly employed: Data backup: Regular and systematic backup of digital data is essential to ensure its preservation.

The findings of the study revealed that cloud storage and digitalization project has mean score of 4.33, while metadata management, collaboration and partnership and digital preservation system has mean score of 4.40 and continues evaluation and updates has the highest mean score of 4.46. This findings agree with the findings of Amughoro, Makgahlela and Bopapen (2014) as the co-authors stated that it is important for users to familiarize themselves with these guidelines to ensure compliance and make the most effective use of the digital information available.

Conclusion

From the findings and discussion of the study, the following conclusion were made. Method employed for preservation strategies were digitization of information resources, data management plan for preservation strategies and collaboration and standards compliance among others. Among the challenges affecting digital preservation strategies are data integrity, technology obsolescence, financial and resources constrains and staffing with technical knowhow. Solution for digital preservation strategies in university library were cloud storage, digitization project, metadata management and digital project.

Recommendations

Based on the finding of this study, the researcher recommended that:

1. Staff should be engaged in regular practical so as to enable them acquire more skills in digitalization of information resources.
2. Government and nongovernment organization should assist in provision of funding for digitization project equipment.
3. To ensure adequate provision of information resources and library services, Nigeria University Commission (NUC) and Nigeria University in general should increase budget allocation to libraries for the provision of online resources through increased budget allocation in university libraries.

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