



SUSTAINABILITY OF DIGITAL PRESERVATION PRACTICES IN FEDERAL UNIVERSITY LIBRARIES IN SOUTHWEST NIGERIA

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Abstract

This study examined digital preservation practices in academic libraries within federal universities in Southwest Nigeria. The objectives were to assess librarians' awareness of digital preservation, identify methods used, and explore challenges to effective implementation. A descriptive survey design was employed, targeting fifty librarians across five purposively selected federal university libraries. Data were collected through structured questionnaires distributed via Google Forms, with forty-two valid responses analysed using SPSS. Descriptive statistics including mean scores and standard deviations were used to interpret the results on a 4-point Likert scale. Findings revealed a high level of awareness among librarians regarding digital preservation concepts (overall mean = 3.14), with strong recognition of its importance and integration into library workflows. However, practical implementation showed moderate engagement, with less familiarity or usage of practices such as refreshing and bit-level preservation. Methods like emulation, metadata creation, format standardization, and digital repositories were more commonly adopted (overall method mean = 2.94). Key challenges included limited funding, inadequate training, poor infrastructure, policy gaps, and technological obsolescence (overall challenge mean = 3.15), all of which significantly hinder implementation. The study concludes that while academic librarians are aware of digital preservation's importance, its effective practice remains constrained by systemic and institutional barriers. To address this, the study recommends strengthening policy frameworks, increasing funding for digital infrastructure, and enhancing professional development through continuous training and collaboration with IT professionals. Bridging the gap between awareness and action is critical for safeguarding the long-term accessibility of digital library resources in Nigeria's academic institutions.

Keywords: Digital, Preservation, Academic, Libraries

Introduction

Digital preservation involves a series of processes and efforts designed to ensure that digital information resources remain accessible for as long as possible. This includes the implementation of policies, strategies, and

actions to maintain the integrity of authentic content over time, addressing issues like technological advancements and potential media failures (Akinlolu et al., 2023). The scope of digital preservation extends to both original digital content and content that has been



converted to digital formats. It is a continuous and coordinated effort to securely store digital information, ensuring its accuracy, accessibility, and interpretability over a long period. The importance of digital preservation has grown significantly due to factors such as the rapid expansion of information, the rise of e-research, the impermanence of digital storage media, and the transient nature of web-based content.

Digital preservation is crucial for ensuring ongoing access to digital content, verifying its accuracy, and addressing challenges such as hardware and software obsolescence (Verma & Sharma, 2023). This sustainability concern is shared among libraries, archives, museums, and digital preservation service providers (Tallman, 2021). Activities in digital preservation are designed to sustain digital resources' availability, incorporating policies, tactics, and activities to ensure their accurate representation over time (State Library, New South Wales, 2021).

Factors like risk of deterioration, catastrophic loss, short digital media lifespan compared to traditional formats, and obsolescence of retrieval technologies underscore digital information preservation's critical importance (Anyira, 2020). Preserving digital objects ensures their accessibility and integrity, facilitating retrieval of their core message.

Digital technologies enhance access and collaboration in libraries but pose risks like obsolescence and data loss. Preserving digital resources in Nigerian academic institutions requires continuous technical expertise and financial support due to evolving formats, software, and hardware. Despite its benefits, digital preservation remains a significant challenge amid the growing digital landscape.

Statement of the Problem

The increasing use of digital technology globally has brought both opportunities and challenges for librarians. The shift to a digital era has raised

crucial issues regarding the organization, accessibility, and preservation of digital resources created by educational institutions. Ensuring long-term access to digital content in institutional repositories (IRs) and archives is a major challenge for academic institutions. Digital preservation aims to make digital content accessible to user communities for extended periods and future generations.

Uncertainty about long-term access to digital assets hinders libraries' full digital transition. Academic libraries face major challenges in sustaining digital preservation due to limited funding, technical expertise, and awareness. These constraints make it difficult to develop and manage effective long-term preservation programs for digital holdings and data repositories. Academic institutions risk losing valuable digital information if these challenges are not addressed promptly. There is limited knowledge about how academic libraries in Southwest Nigeria are managing the preservation of their electronic resources. Therefore, there is a need to investigate the sustainability of digital preservation practices in academic libraries in federal universities in Southwest Nigeria.

Objectives of the Study

1. Determine the level of awareness of digital preservation practices in academic libraries in federal universities in southwest Nigeria.
2. Identify methods used in utilizing the effective preservation of digital materials in academic libraries in federal university libraries in Southwest, Nigeria.
3. Identify the challenges hindering the effective preservation of digital preservation materials in academic libraries in federal university libraries in Southwest, Nigeria

Research Questions



1. To what extent are academic librarians within federal universities in southwest Nigeria aware of digital preservation practices?
2. What are the methods used in utilizing the effective preservation of digital materials in academic libraries in federal university libraries in Southwest, Nigeria?
3. What are challenges hindering the effective preservation of digital preservation materials in academic libraries in federal university libraries in Southwest, Nigeria?

Review of related Literature

Digital preservation and conservation involve systematic strategies to maintain the authenticity, integrity, and accessibility of digital content over time through both technical and organizational measures (Verma & Sharma, 2023). In Nigerian university libraries, librarians have demonstrated growing awareness of digital preservation practices, such as digitizing newspapers, developing institutional repositories, and safeguarding intellectual property. However, success has been uneven due to persistent infrastructural deficiencies and limited financial support (Anyaku, Echedom, & Baro, 2019; Ifijeh et al., 2015; Friday & Eze, 2022). The absence of comprehensive institutional policies, as highlighted by Friday and Eze (2022), further exposes systemic weaknesses that hinder long-term sustainability.

Most university libraries in Nigeria rely on preservation strategies such as migration, encapsulation, and data refreshing. Yet, these efforts are frequently undermined by technology obsolescence, inadequate technical skills, resource constraints, and weak metadata management (Anyaku, Echedom, & Baro, 2019; Akinlolu, Awujoola, & Olawale, 2023). Poor preservation formats, high operational costs, and intellectual property complexities also present

major challenges, while rapid technological advancements demand continuous adaptation and institutional collaboration (Verma & Sharma, 2023).

Conceptually, this study adopts the Open Archival Information System (OAIS) reference model (ISO 14721), an internationally recognized framework for the long-term preservation of digital assets. The OAIS model provides a structured approach that defines the roles, processes, and standards necessary for effective digital archiving. It emphasizes functions such as data ingestion, preservation planning, metadata management, and access dissemination to ensure authenticity and integrity over time (Jalaludin et al., 2025; Hutař & Melichar, 2015). Widely implemented across cultural heritage institutions, OAIS serves as a flexible blueprint that supports trustworthy and sustainable digital repositories through policy development, technological infrastructure, and effective governance.

Key digital preservation techniques identified in the literature include encapsulation, which retains content within its original technological environment (Samiei, 2020); technology emulation, which recreates obsolete platforms using new software (Akinlolu, Awujoola, & Olawale, 2023); and metadata management, which documents the provenance and context of digital objects (Igere, 2022). Other vital strategies such as physical backups, redundancy, migration, and conversion enhance resilience against data loss (Hazarika, 2020; Najjar & Wani, 2019; Somipam & Chennupati, 2018).

Overall, research synthesis indicates that the sustainability of digital preservation in Nigerian university libraries is constrained not only by technical challenges but also by conceptual and policy shortcomings. Persistent issues of inadequate funding, limited training, and absence of clear preservation frameworks continue to threaten the long-term accessibility of digital collections (Wittenberg et al., 2018; Gorzalski,



2018). In line with the OAIS model, bridging these gaps requires comprehensive planning, sound management policies, and consistent evaluation mechanisms (Jalaludin et al., 2025; Hutař & Melichar, 2015).

Sustainable digital preservation in Nigerian university libraries will therefore depend on the coordinated adoption of internationally recognized frameworks such as OAIS, combined with strategic investment in infrastructure, staff development, and policy formulation. Such integrated efforts will ensure the enduring preservation, accessibility, and usability of digital resources (Verma & Sharma, 2023; Friday & Eze, 2022; Anyaoku, Echedom, & Baro, 2019; Jalaludin et al., 2025; Hutař & Melichar, 2015).

Research Methodology

Study Area and Sampling

The study was carried out in five federal university libraries located in Southwest Nigeria. The target population comprised fifty (50) professional librarians employed in these institutions. A purposive sampling technique was adopted to select the universities based on specific inclusion criteria that ensured alignment with the study objectives. The selection criteria included:

- i. universities that had been in existence for at least ten years to ensure institutional maturity and operational stability.
- ii. evidence of ongoing digital preservation initiatives, such as institutional repositories, digitization projects, or related programs.
- iii. availability of ICT infrastructure to support digital preservation activities.
- iv. adequate staffing of professional librarians directly involved in digital curation and preservation.
- v. institutional accessibility and willingness to participate in the study.

These criteria guaranteed that the selected universities were actively engaged in digital preservation and capable of providing credible insights into sustainability practices. Given the relatively small and manageable population size, all fifty professional librarians were included in the study. This comprehensive inclusion strengthened the representativeness of the data and minimized sampling error.

The purposive sampling approach ensured that the chosen institutions were information-rich cases, directly relevant to the study's objective of evaluating sustainability in digital preservation practices. By encompassing all professional librarians (N = 50) within the selected libraries, the study achieved comprehensive data coverage, enhancing both the reliability and validity of its findings regarding the state and sustainability of digital preservation in federal university libraries in Southwest Nigeria.

Data Collection Instrument

Data were collected through a structured questionnaire developed based on a thorough review of relevant literature on digital preservation practices and sustainability in academic libraries. The questionnaire was designed to capture librarians' perceptions and experiences regarding digital preservation practices, challenges, and sustainability factors.

To ensure content validity, the questionnaire draft was reviewed by two experts in library and information science with specialization in digital preservation. A pilot test was conducted with 10 librarians from a federal university library outside the study sample to evaluate the instrument's clarity, relevance, and reliability. Based on pilot feedback, minor modifications were made to improve question wording and format.

Reliability analysis using Cronbach's alpha was performed on pilot data, yielding a coefficient of 0.82, indicating good internal consistency of the instrument. The finalized questionnaire was



administered electronically via Google Forms and distributed through email and WhatsApp groups. Forty-two (42) out of fifty (50) respondents correctly completed and submitted the questionnaire, representing an 84% response rate.

Data Analysis

Data collected were coded and analyzed using the Statistical Package for the Social Sciences

Data Presentation

Research Question One: To what extent are academic librarians within Federal Universities in Nigeria aware of digital preservation practices?

Table 1: Awareness of Digital Preservation Practices among Academic Librarians

Items Statement	SD	D	A	SA	Mean	SD*	Des.
I am aware of the concept of digital preservation.	0 (0.0)	1 (2.4)	18 (42.9)	23 (54.8)	3.52	0.558	A
I have received training on digital preservation practices.	1 (2.4)	11 (26.2)	21 (50.0)	9 (21.4)	2.9	0.778	A
I believe that digital preservation is important for ensuring the long-term accessibility of library resources.	0 (0.0)	2 (4.8)	17 (40.5)	23 (54.8)	3.5	0.595	A
I often engage in digital preservation activities as part of my work.	3 (7.1)	11 (26.2)	21 (50.0)	7 (16.7)	2.76	0.821	A
I am confident in my ability to use digital preservation tools and technologies.	2 (4.8)	9 (21.4)	21 (50.0)	10 (23.8)	2.93	0.802	A
My institution provides enough support for digital preservation efforts.	2 (4.8)	16 (38.1)	16 (38.1)	8 (19.0)	2.71	0.854	A
I understand the risks associated with not preserving digital materials properly.	1 (2.4)	4 (9.5)	18 (42.9)	19 (45.2)	3.31	0.743	A

(SPSS). Descriptive statistics including simple percentages, mean scores, and standard deviations were computed. The four response categories were assigned numerical values from 4 (highest) to 1 (lowest). A cutoff mean score of 2.50 was used to distinguish responses considered influential factors from those less significant. Tabular displays were employed for clarity in presenting findings.



I believe that digital preservation practices should be integrated into the regular workflow of libraries.	0 (0.0)	2 (4.8)	19 (45.2)	21 (50.0)	3.45	0.589	A
I regularly seek updates or information about new developments in digital preservation.	3 (7.1)	8 (19.0)	20 (47.6)	11 (26.2)	2.93	0.874	A
Collaboration with IT staff and other relevant organizations is important for effective digital preservation.	0 (0.0)	3 (7.1)	20 (47.6)	19 (45.2)	3.38	0.636	A
Overall Mean					3.14	0.735	A

The data in Table 1 indicate that academic librarians generally possess a high level of awareness regarding digital preservation, with an overall mean score of 3.14. Respondents showed the strongest agreement with the statement “I am aware of the concept of digital preservation” (mean = 3.52, SD = 0.558), highlighting widespread conceptual understanding. High agreement was also noted on the importance of digital preservation for long-term access (mean = 3.50, SD = 0.595) and its integration into regular library workflows (mean = 3.45, SD = 0.589). Despite this awareness, actual participation in digital preservation activities is moderate. Overall, strong awareness exists, but effective implementation requires greater institutional

Engagement in such tasks had a lower mean of 2.76 (SD = 0.821), and confidence in using preservation tools was similarly modest (mean = 2.93, SD = 0.802), indicating a need for more training and hands-on experience. Institutional support appears inadequate, with the statement “My institution provides enough support for digital preservation efforts” receiving a low mean of 2.71 (SD = 0.854). Still, librarians acknowledged the importance of understanding risks (mean = 3.31, SD = 0.743), staying updated (mean = 2.93, SD = 0.874), and collaboration with IT (mean = 3.38, SD = 0.636).

support and professional development.

Research Question Two: What methods are utilized for digital preservation practices in academic libraries within Federal Universities in Nigeria?

Table 2: Methods Utilized for Digital Preservation Practices

Items Statement	SD	D	A	SA	Mean	SD*	Des.
I used bit-level preservation (e.g., checksums, fixity checks).	3 (7.1)	14 (33.3)	18 (42.9)	7 (16.7)	2.69	0.876	A



I often utilize migration of file formats.	4 (9.5)	12 (28.6)	19 (45.2)	7 (16.7)	2.69	0.897	A
I used emulation of old software/hardware environments.	0 (0.0)	2 (4.8)	21 (50.0)	19 (45.2)	3.4	0.589	A
I used refreshing (copying data to new storage media).	8 (19.0)	17 (40.5)	13 (31.0)	4 (9.5)	2.31	0.935	D
I used cloud-based storage and backups.	3 (7.1)	16 (38.1)	17 (40.5)	6 (14.3)	2.62	0.835	A
I used digital repository systems (e.g., DSpace, Fedora).	1 (2.4)	6 (14.3)	20 (47.6)	15 (35.7)	3.17	0.756	A
I used metadata creation.	0 (0.0)	8 (19.0)	23 (54.8)	11 (26.2)	3.07	0.673	A
I used redundant storage systems (RAID, NAS, etc.).	1 (2.4)	6 (14.3)	24 (57.1)	11 (26.2)	3.07	0.679	A
I used format standardization.	1 (2.4)	4 (9.5)	22 (52.4)	15 (35.7)	3.21	0.709	A
I used regular backups.	1 (2.4)	6 (14.3)	21 (50.0)	14 (33.3)	3.14	0.748	A
Overall Mean					2.94	0.769	A

Table 2 presents data on the various methods employed by respondents for digital preservation practices. The overall mean score of 2.94 suggests a general agreement (A) among respondents that they engage in digital preservation activities. This indicates a positive trend toward the adoption of multiple preservation strategies across academic libraries. Among the listed methods, emulation of

old software/hardware environments received the highest level of agreement (Mean = 3.40, SD = 0.589), indicating it is the most frequently used method. This was closely followed by format standardization (Mean = 3.21, SD = 0.709), digital repository systems (Mean = 3.17, SD = 0.756), and regular backups (Mean = 3.14, SD = 0.748), all of which reflect high levels of



adoption. Other notable practices include metadata creation and the use of redundant storage systems, both with a mean score of 3.07, further emphasizing consistent engagement with preservation standards. The use of bit-level preservation and migration of file formats both recorded a mean of 2.69, suggesting moderate application of these techniques. In contrast, the method of refreshing (i.e., copying data to new storage media) was the least endorsed, with a mean score of 2.31 and a relatively high standard deviation (SD = 0.935), indicating a level of

disagreement (D) and possible unfamiliarity or underutilization among respondents.

Overall, the relatively low standard deviations across most items (ranging from 0.589 to 0.935) suggest a moderate level of consensus among respondents. These findings imply that academic library personnel in Nigerian federal universities are actively implementing diverse digital preservation methods, although there may be a need for increased awareness and capacity building in less-utilized practices like refreshing.

Research Question Three: What challenges are faced in implementing digital preservation practices in academic libraries within Federal Universities in Nigeria?

Table 3: Challenges Faced in Implementing Digital Preservation

Items Statement	SD	D	A	SA	Mean	SD*	Des.
I face challenges related to funding.	1 (2.4)	5 (11.9)	19 (45.2)	17 (40.5)	3.24	0.776	A
I encounter difficulties in selecting materials for digitization.	0 (0.0)	6 (14.3)	23 (54.8)	13 (31.0)	3.17	0.671	A
I find it challenging to provide adequate staff training.	0 (0.0)	5 (11.9)	25 (59.5)	12 (28.6)	3.17	0.616	A
I struggle with maintaining digital preservation equipment.	1 (2.4)	6 (14.3)	23 (54.8)	12 (28.6)	3.1	0.715	A
I face obstacles due to lack of digital collection policies.	2 (4.8)	7 (16.7)	19 (45.2)	14 (33.3)	3.07	0.837	A
Librarians should take a more active role in addressing challenges.	1 (2.4)	4 (9.5)	19 (45.2)	18 (42.9)	3.29	0.752	A
Economic pressures like declining funding impact preservation.	0 (0.0)	7 (16.7)	20 (47.6)	15 (35.7)	3.19	0.717	A



Preserving locally created content like IRs is challenging.	2 (4.8)	7 (16.7)	22 (52.4)	11 (26.2)	3	0.796	A
Open access demands add complexity to preservation.	2 (4.8)	7 (16.7)	21 (50.0)	12 (28.6)	3.02	0.805	A
I face issues with tech obsolescence and compatibility.	1 (2.4)	4 (9.5)	19 (45.2)	18 (42.9)	3.29	0.752	A
Overall Mean					3.15	0.744	A

Table 3 reveals several key challenges faced by academic librarians in implementing digital preservation, with an overall mean score of 3.15 (SD = 0.744), indicating general agreement on the prevalence of these barriers. The highest-rated challenges were technological obsolescence and compatibility issues, and the need for greater librarian involvement, both scoring 3.29 (SD = 0.752). These results reflect concerns about rapidly changing technologies and the need for more proactive engagement by librarians. Funding-related barriers were also prominent. Limited financial resources were rated at 3.24 (SD = 0.776), while broader economic pressures, such as declining budgets, followed closely at 3.19 (SD = 0.717). These findings highlight the financial constraints affecting digital preservation efforts. Operational difficulties were also noted, including selecting materials for digitization (mean = 3.17, SD = 0.671), inadequate staff training (mean = 3.17, SD = 0.616), and challenges in maintaining preservation equipment (mean = 3.10, SD = 0.715). The lack of institutional digital collection policies was acknowledged as a moderate barrier (mean = 3.07, SD = 0.837). Additional issues included demands from open access initiatives (mean = 3.02, SD = 0.805) and the preservation of locally created digital content (mean = 3.00, SD = 0.796).

Overall, the findings emphasize the urgent need for institutional investment, technical infrastructure, training, and sustainable strategies to support digital preservation in academic libraries.

Discussion of Findings

Awareness of Digital Preservation Practices

The data from Table 1 indicate a generally high level of awareness of digital preservation among academic librarians, with an overall mean score of 3.14. This aligns with the findings of Anyaoku, Echedom, and Baro (2019), who noted that Nigerian academic librarians are conversant with the concept and importance of digital preservation, particularly in initiatives like institutional repositories and digitization projects that began in institutions such as Ahmadu Bello University and the University of Nigeria.

The strongest agreement was with the statement "I am aware of the concept of digital preservation" (mean = 3.52), reflecting a widespread conceptual understanding among librarians. This is consistent with Yakubu, Noorhidawati, and Kiran (2022), who found that librarians possess strong theoretical knowledge of digital preservation practices, including strategies such as migration and encapsulation.



Furthermore, respondents acknowledged the relevance of digital preservation for long-term access (mean = 3.50) and its integration into daily workflows (mean = 3.45), underscoring the recognition of its practical value.

However, actual engagement in digital preservation activities was lower (mean = 2.76), with limited confidence in using digital preservation tools (mean = 2.93). This suggests a gap between awareness and practical implementation, echoing Friday and Eze (2022) who emphasized that challenges such as insufficient infrastructure and funding hindered the success of preservation efforts at institutions like Nnamdi Azikiwe University Library.

Additionally, the low institutional support rating (mean = 2.71) reflects systemic issues affecting implementation, similar to the concerns raised by Ifijeh et al. (2015) regarding underfunded and poorly resourced digital preservation programs in Nigerian universities. Despite these challenges, respondents still valued risk awareness (mean = 3.31), staying current with preservation trends (mean = 2.93), and cross-functional collaboration (mean = 3.38), reinforcing Yakubu et al. (2022) who advocated for continuous skills development and partnerships with IT professionals.

Methods Utilized for Digital Preservation

The findings from Table 2 reveal that academic librarians in Nigerian federal universities actively employ diverse digital preservation practices, with an overall mean score of 2.94 indicating general agreement among respondents. This aligns with Yakubu, Noorhidawati, and Kiran (2022), who observed that librarians in Nigeria implement various strategies such as emulation and format standardization, reflected in the high scores for emulation (Mean = 3.40) and format standardization (Mean = 3.21). Similarly, the adoption of digital repository systems (Mean = 3.17) and regular backups (Mean = 3.14) mirrors documented digitization efforts in Nigerian universities, such as the use of DSpace and

institutional repositories noted by Anyaoku, Echedom, & Baro (2019).

Practices like metadata creation and redundant storage (Mean = 3.07) further support findings by Akinlolu, Awujoola, & Olawale (2023), who emphasized the role of copying and storing digital assets across platforms. However, methods like bit-level preservation and file format migration (Mean = 2.69) show moderate adoption, despite their critical importance highlighted in the literature (Samiei, 2020; Najjar & Wani, 2019). This may be due to infrastructural and capacity limitations, as discussed by Friday and Eze (2022).

The least adopted method, refreshing (Mean = 2.31), despite being acknowledged in prior studies, appears underutilized likely due to limited awareness or access to appropriate tools, as echoed by Ifijeh et al. (2015) and Verma & Sharma (2023). While most practices show low standard deviations, indicating consensus, systemic issues such as funding and technical expertise remain barriers (Wittenberg et al., 2018; Gorzalski, 2018). Overall, while Nigerian librarians demonstrate commendable engagement in core digital preservation methods, greater investment in capacity building and infrastructure is essential for comprehensive implementation.

Challenges Faced in Implementing Digital Preservation

As presented in Table 3, the overall mean score of 3.15 indicates widespread agreement among librarians on the prevalence of implementation challenges. The most critical issues identified were technological obsolescence, compatibility issues, and the need for increased librarian involvement (mean = 3.29). These findings resonate with Verma and Sharma (2023), who emphasized that outdated technologies, software incompatibility, and lack of sustainable systems severely threaten the longevity of digital collections.



Funding-related barriers were also significant. Limited financial resources (mean = 3.24) and economic pressures (mean = 3.19) reflect the declining budgets for higher education institutions, consistent with Wittenberg et al. (2018) who observed that economic constraints and reduced funding are undermining digital preservation efforts in academic libraries.

Operational challenges such as material selection (mean = 3.17), inadequate training (mean = 3.17), and equipment maintenance (mean = 3.10) indicate structural gaps in implementation. Gorzalski (2018) supports these findings, reporting that staffing shortages, lack of training time, and minimal investment in infrastructure are major setbacks in born-digital preservation initiatives.

The lack of institutional policy (mean = 3.07) was also highlighted as a significant concern, echoing Ifijeh et al. (2015) and Friday and Eze (2022), who emphasized the absence of cohesive strategies and governance frameworks to guide digital preservation in Nigerian libraries.

Finally, concerns related to open access demands and preserving locally generated content (means = 3.02 and 3.00 respectively) underscore the complexity of managing digital scholarly output, as noted by Wittenberg et al. (2018). The study revealed that academic libraries, now acting as publishers through institutional repositories, face additional pressures to preserve dynamic and distributed digital materials.

Conclusion

The study reveals that academic librarians in Nigerian federal universities possess a commendable level of awareness and theoretical understanding of digital preservation practices, recognizing their importance for long-term access and scholarly continuity. However, this awareness is not fully matched by practical implementation, largely due to systemic challenges such as limited funding, inadequate

infrastructure, insufficient training, and lack of institutional support. While core practices like emulation, format standardization, metadata creation, and repository use are moderately adopted, advanced methods such as bit-level preservation and refreshing remain underutilized. Moreover, widespread challenges including technological obsolescence, policy gaps, equipment maintenance, and economic constraints continue to hinder the full realization of robust digital preservation frameworks. Therefore, bridging the gap between awareness and practical execution is essential for safeguarding Nigeria's digital heritage.

Recommendations

Based on the findings of this study, the following recommendations are made to enhance digital preservation practices in academic libraries:

1. Strengthen Institutional and Policy Frameworks:

University administrators and policymakers should develop and enforce comprehensive digital preservation policies. These policies should outline strategic plans for preservation, designate responsibilities, and ensure sustainability through institutional commitment and governance.

2. Invest in Infrastructure and Technological Resources:

Government bodies and university management should prioritize funding for digital preservation infrastructure. Investments should focus on acquiring modern hardware, software, and backup systems capable of supporting advanced practices like bit-level preservation, refreshing, and file format migration.

3. Enhance Professional Development and Collaboration:

Regular training programs, workshops,



and certifications should be organized to build technical competencies among librarians. Institutions should also foster partnerships with IT professionals and digital preservation experts to promote interdisciplinary collaboration and knowledge sharing for more effective practice.

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