



ORIGINAL RESEARCH ARTICLE

Enhancing the Preservation of Indigenous Knowledge through Institutional Repositories: The Role of Metadata Standards in Selected Nigerian University Libraries

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ARTICLE INFO

ARTICLE TYPE

Original Research

RECEIVED

15 August, 2026

REVISED

17 September, 2026

ACCEPTED

10 October, 2026

PUBLISHED ONLINE

31 October, 2026

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HOW TO CITE

Shitta, E. M. & Adeyeye, S. V. (2026).

Enhancing the Preservation of Indigenous Knowledge through Institutional Repositories: The Role of Metadata Standards in Selected Nigerian University Libraries. *Lead City International Journal of Library, Information & Communication Sciences*, 3(1), 47–65.

<https://doi.org/10.63741/lcijlics.2026.0302.07-j>

ABSTRACT

Indigenous knowledge, largely transmitted through oral traditions, is increasingly threatened by modernization, globalization, and inadequate documentation practices. While institutional repositories in Nigerian universities offer opportunities for preservation, conventional metadata standards such as Dublin Core, MODS, and METS have proven insufficient in capturing the cultural context and complexity of indigenous knowledge. This gap motivates the need to examine how metadata standards can better support its preservation and accessibility. This study focuses on assessing the effectiveness of metadata standards in preserving indigenous knowledge within thirty (20) selected Nigerian universities with 30 respondents. It evaluates current preservation practices, identifies the metadata standards in use, and examines challenges affecting their implementation. A descriptive research design was adopted, targeting librarians and repository managers in institutions with functional repositories. Data were collected through structured instruments and analyzed to determine the adequacy and limitations of existing metadata frameworks. Findings reveal that although institutional repositories exist, indigenous knowledge is underrepresented due to inadequate metadata structures, lack of localization, and limited professional capacity. Existing standards do not fully accommodate the unique attributes of indigenous knowledge systems. The study concludes that effective preservation of indigenous knowledge requires the adaptation and development of culturally responsive metadata frameworks. It recommends the customization of existing standards, capacity building for information professionals, and the establishment of supportive policies to enhance documentation, accessibility, and long-term sustainability of indigenous knowledge resources.

Keywords: *Preservation, Indigenous knowledge, Institutional Repositories, Metadata Standard, Nigeria, University Libraries*

1. INTRODUCTION

Indigenous knowledge represents the cumulative body of skills, practices, beliefs, and innovations developed by indigenous communities over generations through close interaction with their environment (Madonsela & Machete, 2025). In Nigeria, indigenous knowledge encompasses diverse areas such as traditional medicine, agriculture, cultural practices, folklore, crafts, conflict resolution mechanisms, and environmental management. This knowledge is largely transmitted orally and through practice, making it vulnerable to loss due to modernization, urbanization, globalization, and the diminishing role of traditional custodians of knowledge. Universities and research institutions have increasingly been recognized as critical stakeholders in the preservation and dissemination of indigenous knowledge (Adedokun & Osuagwu, 2026). University libraries play a central role in collecting, organizing, preserving, and providing access to knowledge resources. With the advancement of information and communication technologies (ICTs), institutional repositories (IRs) have emerged as effective digital platforms for capturing, preserving, and disseminating scholarly and cultural resources, including indigenous knowledge materials. Institutional repositories enable long-term preservation, wider visibility, and increased accessibility of digital content beyond physical and geographical limitations.

Despite the growing adoption of institutional repositories in Nigerian university libraries, the preservation of indigenous knowledge within these repositories remains inadequate. Many indigenous knowledge resources are poorly documented, inconsistently described, or completely excluded from digital collections. One of the major challenges confronting the effective preservation of indigenous knowledge in institutional repositories is the lack of appropriate metadata standards. Metadata serves as the backbone of digital repositories by enabling resource discovery, interoperability, authenticity, and long-term preservation. Without well-defined and consistently applied metadata standards, indigenous knowledge materials stored in institutional repositories may become difficult to retrieve, interpret, or sustain over time. Metadata standards such as Dublin Core, Metadata Object Description Schema (MODS), and Metadata Encoding and Transmission Standard (METS) have been widely adopted for organizing digital resources in institutional repositories (Madondo & Matingwina, 2023). However, these standards are often designed to accommodate conventional scholarly outputs and may not fully capture the contextual, cultural, and communal dimensions of indigenous knowledge. In Nigerian university libraries, limited awareness, inadequate technical expertise, and the absence of localized metadata frameworks further complicate the effective use of metadata standards for indigenous knowledge preservation.

Given Nigeria's rich cultural diversity and the increasing risk of indigenous knowledge erosion, there is an urgent need to explore how metadata standards can be effectively leveraged within institutional repositories to enhance the preservation of indigenous knowledge (Aminu, Danjuma & Adamu 2026). Examining the role of metadata standards in Nigerian university libraries will provide insights into current practices, challenges, and opportunities for improving the organization, accessibility, and sustainability of indigenous knowledge resources. This study, therefore, seeks to investigate how metadata standards can enhance the preservation of indigenous knowledge in institutional repositories within Nigerian university libraries, with the aim of contributing to improved digital preservation strategies and informed library practice.

1.2 Statement of the Problem

Despite the rich diversity of indigenous knowledge in Nigeria, much of this knowledge remains inadequately preserved and poorly represented in institutional repositories of Nigerian university libraries. Institutional repositories largely prioritize conventional scholarly outputs, while indigenous knowledge materials, where available, are often inconsistently described, insufficiently contextualized, and difficult to retrieve. This challenge is largely attributed to the ineffective application and limited adaptation of metadata standards, which are typically designed for formal academic content and do not adequately capture the cultural, communal, and contextual attributes of indigenous knowledge. In addition, the absence of standardized metadata practices, limited technical expertise, and weak policy support in Nigerian university libraries have further hindered the effective preservation and accessibility of indigenous knowledge resources in institutional repositories, thereby placing these valuable knowledge assets at risk of loss.

1.3 Aim and objective of the Study

The aim of this study is to examine the role of metadata standards in enhancing the preservation of indigenous knowledge through institutional repositories in Nigerian university libraries.

The specific objectives of the study are to:

- I. assess the current level of indigenous knowledge present in Nigerian University
- II. examine the metadata standards used for preserving indigenous knowledge in institutional repositories of Nigerian university libraries.
- III. assess the effectiveness of these metadata standards in supporting the preservation of indigenous knowledge resources; and
- IV. identify challenges for improving the use of metadata standards to enhance indigenous knowledge preservation in institutional repositories

1.4 Research Questions

- a) What is the current level of indigenous knowledge preservation in Nigerian university libraries?
- b) Which metadata standards are adopted in institutional repositories for preserving indigenous knowledge resources?
- c) What are the factors that affect the effective use of metadata standards for indigenous knowledge preservation?
- d) How can the challenges be mitigated to achieve better preservation of indigenous knowledge?

1.4 Scope of the Study

This study focuses on examining the role of metadata standards in enhancing the preservation of indigenous knowledge through institutional repositories in Nigerian university libraries. The scope of the study is limited to selected Nigerian universities in the North-East, North-West, and North- Central that operate functional institutional repositories. It specifically covers the types of metadata standards used for describing indigenous knowledge resources, the effectiveness of these standards in supporting access and long-term preservation, and the challenges encountered in their application. The study involves librarians, repository managers, and other information professionals responsible for managing these repositories.

Geographically, the study is confined to North-East, North-West and North Central Nigeria, while thematically it is restricted to institutional repositories, metadata standards, and indigenous knowledge preservation. Particularly Dspace was of interest because it has been observed that it is widely adopted in most of the Universities in Nigeria.

2. LITERATURE REVIEW

Indigenous Knowledge (IK) is widely recognized as a legitimate and dynamic knowledge system rooted in Indigenous communities' cultural practices, oral traditions, and lived experiences (Agrawal, 1995; Battiste, 2002). In Nigeria, IK forms a vital component of cultural heritage, encompassing traditional beliefs, practices, and innovations transmitted across generations. Nigeria's diversity of over 250 ethnic groups, including Yoruba, Igbo, and Hausa populations, reflects multiple knowledge systems with distinct epistemological foundations and transmission mechanisms (Mustapha, 2017; Abioye et al., 2017). This diversity presents challenges for Library and Information Science (LIS) professionals who must develop culturally sensitive strategies for organizing, preserving, and providing access to IK while maintaining its contextual integrity (Omigie et al., 2015; Odunlade et al., 2019). The preservation of IK has become a major concern in LIS due to threats from globalization, modernization, and historical marginalization. Because IK is primarily transmitted orally and through social practices, its documentation within formal information systems remains complex (Ocholla, 2020). Libraries are increasingly recognized as key institutions for safeguarding IK while respecting knowledge sovereignty. However, conventional preservation approaches grounded in Western epistemologies often fail to adequately represent Indigenous worldviews. Standard classification systems and metadata structures may decontextualize IK, necessitating culturally responsive preservation frameworks developed collaboratively with Indigenous communities (Duarte & Belarde-Lewis, 2021; Farnel et al., 2021).

Digitization has emerged as an important strategy for preserving IK through digital libraries, oral history archives, and community repositories that document Indigenous languages and cultural expressions (Roy, 2022). Nevertheless, scholars emphasize that digitization must address ethical concerns such as consent, access control, and Indigenous data sovereignty to avoid replicating extractive research practices (Jarvelin & Vakkari, 2022). Contemporary scholarship also highlights the evolving role of libraries as active partners in IK preservation through participatory approaches involving Indigenous communities in decision-making processes (Omarsaib et al., 2023). Consequently, IK preservation is framed as both a technical and ethical responsibility requiring collaborative and culturally respectful practices (Ocholla, 2020; Duarte & Belarde-Lewis, 2021). Institutional repositories (IRs) have become essential platforms for collecting, preserving, and disseminating scholarly outputs in Nigerian university libraries. IRs enhance research visibility, promote open access, and support digital knowledge preservation (Igboechesi et al., 2023). By providing free access to locally produced scholarships, IRs improve citation impact and institutional reputation (Okoro, 2025). However, their effectiveness is constrained by uneven awareness among academic staff and structural challenges including inadequate infrastructure, poor internet connectivity, and weak policy frameworks (Oladokun & Bakare-Fatungase, 2024; Okoroma, 2019; South-East Nigeria IR study, 2023). Limited technical expertise and low participation in self-archiving further hinder repository development (Esse & Haliso, 2024; Sambo et al., 2022). Scholars therefore

recommend increased funding, capacity building, and institutional policy development to strengthen IR implementation (Ogbomo & Muokebe, 2025).

Metadata standards play a foundational role in organizing and preserving knowledge within libraries and digital repositories. These structured frameworks support interoperability, resource discovery, and long-term preservation (Gilliland, 2022). Dublin Core provides flexible descriptive elements for resource identification, MODS offers richer bibliographic description compatible with MARC records, and METS supports structural and administrative metadata for complex digital objects (Weibel, 2021; Day & Hillmann, 2020; Caplan & Lavoie, 2021). Beyond Dublin Core, several metadata standards support the description, organization and preservation of digital resources. MARC 21 remains a major library standard for encoding and exchanging bibliographic information, while MODS provides a richer XML-based descriptive structure derived from MARC 21 and suited to digital-library applications (Library of Congress, 2024). METS complements descriptive standards by packaging structural, administrative and descriptive metadata for complex digital objects (Guenther, 2003). PREMIS further supports long-term digital preservation by recording preservation-related information about digital objects and their management.

Other specialized standards include EAD for hierarchical archival description and CDWA for cultural and visual heritage materials. These standards are potentially relevant to indigenous knowledge collections containing oral histories, manuscripts, photographs, artworks and other cultural materials. However, the application of conventional metadata standards to indigenous knowledge requires careful cultural and contextual adaptation. Khalid et al. (2019) argue that supposedly universal metadata standards such as Dublin Core can inadequately represent Indigenous traditional knowledge, particularly issues relating to attribution, cultural specificity and Indigenous data sovereignty. Similarly, recent Nigerian research emphasizes the need for IK-adapted metadata standards as part of sustainable indigenous knowledge digitization (Aminu et al., 2026). Thus, Nigerian university libraries need not only established metadata standards but also locally responsive extensions that accommodate indigenous languages, cultural contexts, community ownership and culturally determined access conditions.

In the work of Hussain (Hussain et al; 2023) MARC 21 was analyze, their analysis reveals its fragmented support for Intangible Cultural Heritage (ICH), highlighting the need for a dedicated metadata element set. Hussain emphasizes the challenges in preserving and retrieving indigenous knowledge effectively within existing MARC standards.

Through these standards, metadata enables discoverability, preservation workflows, and rights management, ensuring that knowledge resources remain accessible and authentic over time (Gilliland, 2022; Weibel, 2021). Despite these advancements, preserving IK remains challenging. Its oral, community-based, and context-specific nature complicates documentation and classification within conventional systems (Battiste, 2022). Technological limitations, language barriers, and the absence of culturally appropriate metadata frameworks further impede preservation efforts (Nakata, 2021; Duarte & Belarde-Lewis, 2021). Ethical concerns regarding ownership, consent, and intellectual property also influence community participation in preservation initiatives (Smith, 2020). These challenges underscore the

importance of culturally responsive and community-driven preservation strategies (Battiste, 2022; Duarte & Belarde-Lewis, 2021).

Although scholarships on IK preservation, institutional repositories, and metadata standards are expanding, several research gaps remain. Most empirical studies focus on scholarly outputs rather than Indigenous Knowledge content, limiting understanding of how IRs can preserve oral and community-based knowledge systems (Ukwoma & Mole, 2025). Research on adapting metadata standards to Indigenous epistemologies remains limited despite reported inconsistencies in metadata quality within Nigerian repositories (Duarte & Belarde-Lewis, 2021; Agada Enenche et al., 2024). Furthermore, empirical frameworks for community participation, ethical governance, and Indigenous data sovereignty in repository development are underexplored (Battiste, 2022; Smith, 2020). Infrastructural and human capacity challenges are widely acknowledged, yet few studies evaluate effective interventions to address these barriers in Nigerian university libraries (Oladokun & Bakare-Fatungase, 2024; Okoroma, 2019).

2.1.1 Theoretical Framework

This study proposes that the effectiveness of indigenous knowledge preservation in Nigerian university libraries is influenced by the degree of alignment between metadata and digital technologies, professional capacity, institutional support and indigenous cultural requirements. Where these components are adequately integrated, libraries are more likely to achieve effective organization, discoverability, accessibility, authenticity and long-term preservation of indigenous knowledge. Conversely, weaknesses in any of these components may undermine the effectiveness of preservation initiatives.

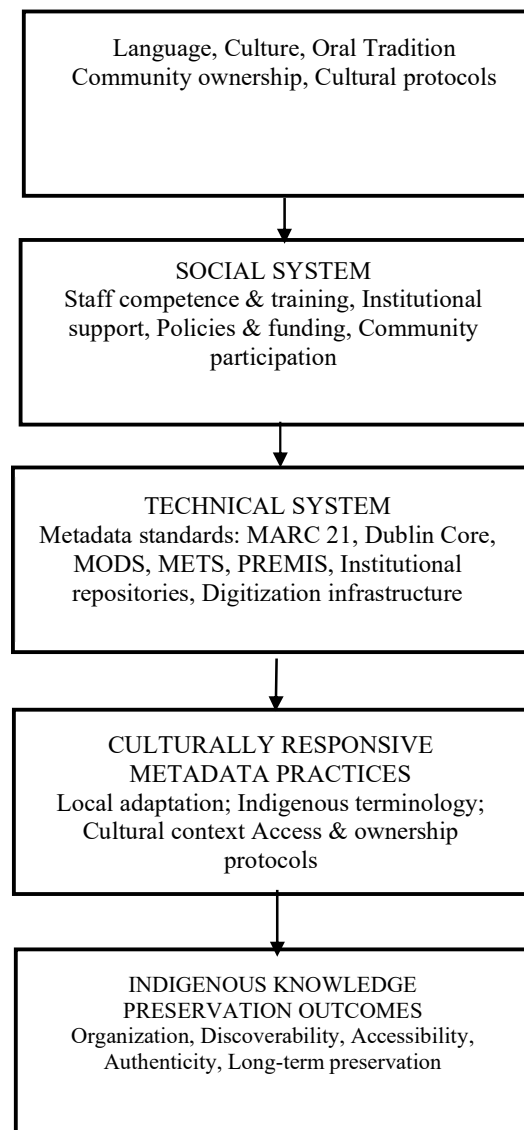


Figure 1: Theoretical framework

Figure 1 shows the theoretical framework, the framework provides the basis for examining indigenous knowledge preservation as a socio-technical and culturally situated process, rather than as a purely technological activity. It enables the study to examine how metadata standards and repository technologies interact with human capacity, institutional support and cultural requirements to influence the preservation of indigenous knowledge in Nigerian university libraries.

3. METHODOLOGY

This study utilized a descriptive survey design, which is appropriate for examining existing conditions and practices. This approach enabled the researcher to gather relevant data on how metadata standards are applied in the preservation of indigenous knowledge within Nigerian university libraries. The target population consisted of thirty (30) library personnel across federal, state, and private universities in Nigeria. This included librarians, repository managers, archivists, IT staff, and academic personnel involved in knowledge organization and management. These groups were considered suitable due to their direct engagement with institutional repositories and metadata systems. A purposive sampling technique was employed to select respondents with relevant expertise. This ensured that participants possessed adequate knowledge of metadata practices and indigenous knowledge preservation. The sample covered institutions from different categories of ownership to ensure representativeness. Data was collected using a structured questionnaire developed specifically for this study. The instrument was divided into five sections covering demographic information, preservation practices, metadata standards, challenges, and improvement strategies. The questionnaire consisted mainly of closed-ended questions, allowing for uniform responses and ease of statistical analysis.

To ensure content validity, the instrument was reviewed by experts in library and information science. Their input helped refine the structure, clarity, and relevance of the questions to align with the study objectives. The reliability of the research instrument was assessed through a pilot study conducted with a group of respondents who were not included in the main study. The internal consistency of the instrument was determined using Cronbach's alpha coefficient. The analysis yielded a Cronbach's alpha value of 0.72, indicating a good level of internal consistency among the items. This result suggests that the instrument was sufficiently reliable for use in the main study. The questionnaire was distributed electronically using Google Forms, enabling efficient data collection from geographically dispersed respondents. Participants were informed about the purpose of the study and assured that their responses would remain confidential. The collected data were analyzed using descriptive statistical techniques, including frequencies, percentages, and mean scores. The findings were presented using tables to enhance clarity and interpretation. Ethical standards were strictly observed. Participation was voluntary, respondents' identities were protected, and all data were used solely for academic purposes.

The results are organized according to the research questions and interpreted using descriptive statistics.

Table 1 displays how many institutions preserve indigenous knowledge materials, broken down by their level of preservation efforts. The data reveals that the most common response is "Not at all," representing 11 institutions. In contrast, only 2 institutions preserve these materials "Extensively." For the remaining categories, 9 institutions preserve them "Minimally"

and 8 do so "Moderately." Combined, a total of 19 institutions offer some level of preservation, outnumbering those that do not preserve materials at all.

Table 1: Indigenous knowledge Materials

Response Category	Frequency (n)	Percentage (%)
Not at all	11	36.7
Yes (Extensively)	2	6.7
Yes (Minimally)	9	30.0
Yes (Moderately)	8	26.7
Total	30	100.0

Table 2 illustrates the count of different types of indigenous knowledge that are preserved.

The data indicates that the highest count belongs to materials that are "Not preserved," representing 13 instances. Among the categories where preservation does occur, "Cultural artifacts (images/text)" are the most common with a count of 8, followed by "Folklore and language resources" with 5. Both "Indigenous medicine knowledge" and "Oral traditions (audio/video)" have the lowest representation, each with a count of 2.

Table 2: Preservation of indigenous knowledge

Category	Frequency (n)	Percentage (%)
Not preserved	13	43.3
Cultural artifacts (images/text)	8	26.7
Indigenous medicine knowledge	2	6.7
Folklore and language resources	5	16.7
Oral traditions (audio/video)	2	6.7
Total	30	100.0

Table 3 illustrates how respondents rate the overall level of indigenous knowledge preservation.

The data highlights a predominantly negative perception, with the highest count belonging to the "Low" rating at 11, followed closely by "Very Low" at 9. Together, these two critical ratings represent most of the responses. In contrast, "Moderate" preservation received 5 votes, while positive assessments are minimal, with "High" sitting at 3 and "Very high" at just 2.

Table 3: Level of indigenous preservation

Rating Category	Frequency (n)	Percentage (%)
Very Low	9	30.0
Low	11	36.7
Moderate	5	16.7
High	3	10.0
Very High	2	6.7
Total	30	100.0

Table 4 illustrates the inclusion of indigenous knowledge resources within institutional repositories. The data shows that the largest single category is "Not included," with a count of 10. Institutional progress is mostly tentative or incomplete, as both "Planned but not implemented" and "Partially integrated" share an equal count of 9. Meanwhile, complete integration is rare, with only 2 institution reporting that resources are "Fully integrated."

Table 4: Indigenous knowledge resources

Category	Frequency (n)	Percentage (%)
Not included	10	33.3
Planned but not implemented	9	30.0
Partially integrated	9	30.0
Fully integrated	2	6.7
Total	30	100.0

The data reveals that MARC 21 is the most widely adopted standard with a count of 9, followed closely by Dublin Core at 8. A notable portion of respondents are "Not sure" of their standard, accounting for a count of 6. Specialized schemas see much lower adoption, with both METS and MODS tying at a count of 3. Finally, only 1 institution reports that no standard is used at all.

Table 5: Primary metadata used in surveyed institutions

Metadata Standard	Frequency (n)	Percentage (%)
Not sure	6	20.0
MARC 21	9	30.0
No standard used	1	3.3
Dublin Core	8	26.7
METS	3	10.0
MODS	3	10.0

Metadata Standard	Frequency (n)	Percentage (%)
Total	30	100.0

Table 6 shows how respondents rate the adequacy of their primary metadata standard. The largest group of respondents considers their metadata standard to be "Moderately Adequate," with a count of 11. Positive ratings include 7 votes for "Adequate" and 3 votes for "Very Adequate." On the critical side, 5 respondents rate their standard as "Inadequate," while 4 view it as "Very Inadequate." Combined, a total of 10 respondents identify clear gaps (Inadequate/Very Inadequate) in their system's metadata capabilities.

Table 6: Adequacy of metadata standard

Response Category	Frequency (n)	Percentage (%)
Very Inadequate	3	10.0
Inadequate	5	16.7
Moderately Adequate	11	36.7
Adequate	7	23.3
Very Adequate	4	13.3
Total	30	100

Table 7 illustrates whether institutions customize their metadata standards. The data shows that most institutions implement "No customization," yielding the highest count of 19. Gaps in active modification are further highlighted by a small segment of respondents who are "Not sure" at a count of 3. Where customization does occur, it is mostly minor, with 5 institutions selecting "Yes (Partially customized)" and only 3 indicating "Yes (Extensively customized)."

Table 7: Meta data customization

Response Category	Frequency (n)
Not sure	3
Yes (Extensively customized)	3
No customization	19
Yes (Partially customized)	5
Total	30

Table 8 illustrates how frequently institutions review their metadata standards. The data reveals that active maintenance is uncommon, with "Rarely" being the most frequent response at a count of 12. This is followed closely by "Occasionally" with a count of 10. In contrast,

structured or non-existent review schedules are minimal, as both "Regularly" and "Never" share an identical, low count of 3.

Table 8: Metadata standard reviewed

Response Category	Frequency(n)
Rarely	12
Regularly	3
Never	5
Occasionally	10
Total	30

Table 9 illustrates the level of difficulty institutions face when applying metadata standards. The data shows that the highest number of respondents holds a "Neutral" stance, with a count of 15. Challenges with application are prominent, as 8 respondents find it "Difficult" and 2 find it "Very Difficult." Conversely, only 5 respondents report that applying these standards is "Easy."

Table 9: Difficulty in applying metadata standard

Response Category	Frequency(n)
Neutral	15
Easy	5
Very Difficult	2
Difficult	8
Total	30

Table 10 illustrates the main challenges affecting metadata use among the surveyed institutions. The data identifies "Inadequate training" as the most prominent obstacle, with a count of 10. Human resource constraints are further highlighted by "Lack of expertise," which holds the second-highest count at 7. Technical and structural issues are also notable, with "Technological limitations" at 6 and "Lack of standardization" at 4. Finally, "Poor institutional support" represents the least cited but still relevant challenge with a count of 3.

Table 10: What affects metadata utilization

Response Category	Frequency
Lack of expertise	7
Inadequate training	10
Technological limitations	6
Lack of standardization	4

Response Category	Frequency
Poor institutional support	3
Total	30

Discussion of Findings

The current state of indigenous knowledge preservation in Nigerian university libraries is critical, marked by minimal active preservation, severe digital repository bottlenecks, and a deeply pessimistic internal perception of institutional success. The single largest segment of surveyed libraries does not engage in any form of preservation whatsoever, with eleven institutions completely inactive. Where preservation efforts do occur, they are heavily skewed toward tangible resources like cultural artifacts and folklore or language assets, leaving highly fragile, intangible materials such as indigenous medicinal knowledge and oral traditions largely ignored. This finding is consistent with Ojobor et al. (2021), who reported that indigenous knowledge was at risk of extinction in South-East Nigerian federal university libraries because of inadequate collection and preservation efforts. Similarly, Anyira et al. (2017) found that libraries in the Niger Delta did not effectively manage indigenous knowledge resources, emphasizing the need for systematic recording, storage and dissemination.

This operational stagnation is further compounded by a failure to integrate these resources into modern digital infrastructures. Ten institutions explicitly exclude indigenous materials from their institutional repositories, while an additional eighteen libraries remain completely stalled in either the planning or partial implementation phases. Only a single library has achieved full repository integration. Consequently, the professionals working within these institutions hold an overwhelmingly negative view of their current progress; twenty respondents rate their overall level of indigenous knowledge preservation as low or very low, highlighting a systemic failure to safeguard this vital heritage. This finding reinforces the concerns raised by Ilo (2012), who identified documentation and preservation of indigenous knowledge in Nigerian academic libraries as challenging while highlighting ICT as an important avenue for improving its documentation and accessibility. More recent evidence from Northern Nigeria similarly indicates that the preservation and digitization of indigenous knowledge materials in academic libraries remain critically neglected (Aminu et al., 2026). Consequently, the professionals working within these institutions hold an overwhelmingly negative view of their current progress, with twenty respondents rating the overall level of indigenous knowledge preservation as low or very low. Taken together, these findings indicate a substantial gap between the recognized importance of indigenous knowledge and the actual institutional mechanisms available for its systematic preservation, digitization and accessibility.

To organize and store indigenous resources, Nigerian university libraries rely almost exclusively on traditional, Western-centric bibliographic standards that lack the flexibility required for local cultural materials. The baseline frameworks are heavily dominated by traditional systems, specifically MARC 21 and Dublin Core, while specialized, structurally expressive metadata schemas like METS and MODS see virtually no adoption. Compounding this rigid framework is a total absence of local adaptation; a staggering nineteen institutions report zero customization of their metadata standards, meaning they apply global schemas entirely out-of-the-box. This finding supports the broader argument that conventional knowledge-organization systems may not adequately represent the cultural context and distinctive characteristics of indigenous knowledge. For example, Madhumali and Wanigasooriya (2022) found that existing cataloguing structures were inadequate for effectively organizing indigenous knowledge and consequently proposed an expanded MARC-based approach

capable of accommodating diverse indigenous formats, including oral materials, folklore, photographs, films and other non-traditional resources.

Because these systems are not modified to handle the complex nuances of indigenous knowledge, they fail to meet the day-to-day needs of catalogers. A combined eight respondents label their primary metadata standard as explicitly inadequate or very inadequate. Furthermore, governance and system maintenance are practically non-existent. Twelve institutions rarely review their metadata standards and three never do, resulting in an alarming gap in institutional awareness where six respondents are entirely unsure of what metadata framework their library even utilizes. This concern is consistent with recent Nigerian evidence. Aminu et al. (2026) reported that academic libraries in Northern Nigeria had no functional policy provisions for indigenous-knowledge metadata standards and identified the development of IK-adapted metadata standards as one of the foundations required for effective preservation and digitization.

Furthermore, the limited review and maintenance of metadata standards identified in the present study, twelve institutions rarely review their standards and three never do, suggests weak institutional governance of metadata practices. The fact that six respondents were completely unsure of the metadata framework used by their libraries further demonstrates an institutional knowledge and governance gap. This is particularly problematic because effective organization of indigenous knowledge requires not merely the adoption of a metadata schema but deliberate decisions about how local languages, cultural concepts, community terminology, oral traditions and culturally specific relationships are represented. Earlier Nigerian scholarship similarly emphasized the need for information professionals to develop appropriate systems for organizing oral information and to establish policies that support the recording and documentation of indigenous knowledge (Oyelude & Adewumi, 2006)

The ineffective use of metadata standards for indigenous preservation stems from an interconnected matrix of severe human resource deficits, cultural-linguistic barriers, and weak organizational backing (Balogun & Adjei, 2026; Bolarinwa, 2026). At the forefront of these challenges is a critical capacity bottleneck, with inadequate training and an outright lack of expertise cited as the top two overall obstacles affecting metadata use (Balogun & Adjei, 2026). Because staff members lack specialized technical proficiency, the daily cataloging workflow is highly friction-ridden, causing a combined ten respondents to find the actual application of metadata standards to be difficult or very difficult.

Beyond these technical hurdles, the unique nature of the material introduces massive descriptive friction. A combined twenty-one respondents classify language and cultural issues as a significant or very significant barrier, proving that traditional schemas fail to accurately capture indigenous contexts; this directly corroborates the consensus that librarians must move beyond rigid Western schemas to prevent chronic cataloging friction (Bolarinwa, 2026). These issues are exacerbated by a deficient institutional ecosystem. Libraries lack the structural and financial backing required to scale their operations; twelve respondents report that their overall institutional support level is inadequate or very inadequate, while poor institutional support is explicitly cited as a primary operational bottleneck (Bolarinwa, 2026; SSRN, 2026)

To overcome these systemic bottlenecks and achieve meaningful preservation, the data outlines a clear, actionable roadmap centered on national standardization, capacity building, and active community engagement. First and foremost, there is an overwhelming institutional mandate for

policy-level reform, with twenty-six respondents explicitly agreeing or strongly agreeing that establishing a unified National Metadata Standard is essential to solving the current fragmentation across academic libraries.

On a tactical level, institutions must prioritize aggressive capacity building. Staff training emerged as the absolute highest priority strategy for improvement among twelve respondents, which underscores a critical need to expand the scale and availability of professional development. To immediately enhance the visibility and reach of these collections, thirteen respondents identify targeted digitization initiatives as the single best pathway to scale and improve user access. Finally, libraries recognize that these systems cannot be built in isolation from the cultures they represent; a near-unanimous 93.3% of respondents state that active, ongoing collaboration with indigenous source communities is highly critical to ensuring the authenticity and longevity of preserved materials. The need for establishment of a unified National Metadata Standard has 86.7%, the least among the strategies is staff training and capacity building with 40% as presented in Table 11.

Table 11: Statistical data for mitigating challenges

Strategy	Frequency (n)	Percentage (%)	Priority
Establishment of a unified National Metadata Standard	26	86.7	Very High
Staff training and capacity building	12	40.0	Highest
Targeted digitisation initiatives	13	43.3	High
Collaboration with indigenous source communities	14	93.3	Very High

5. CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the role of metadata standards in enhancing the preservation of indigenous knowledge in institutional repositories within Nigerian university libraries. The findings reveal that despite the growing recognition of institutional repositories as vital tools for digital preservation, their current use for indigenous knowledge remains limited and largely ineffective. A significant number of institutions either do not preserve indigenous knowledge at all or do so at a minimal level, indicating a major gap in safeguarding this important cultural heritage. The study further shows that where preservation exists, it is uneven and selective. Libraries tend to focus more on tangible forms of indigenous knowledge, such as cultural artifacts and written materials, while intangible resources like oral traditions and indigenous medical knowledge are largely neglected. This imbalance highlights the vulnerability of indigenous knowledge systems that depend heavily on oral transmission and community practices.

In terms of metadata application, the study found that most institutions rely on conventional standards such as MARC 21 and Dublin Core. However, these standards are not adequately

designed to capture the cultural, contextual, and communal characteristics of indigenous knowledge. Additionally, the lack of customization of these standards further limits their effectiveness, resulting in only moderate levels of adequacy and, in some cases, outright dissatisfaction among users. The study also identified several challenges hindering effective metadata use. These include inadequate training, lack of expertise, technological limitations, absence of standardization, and weak institutional support. These factors not only make the application of metadata standards difficult but also contribute to poor maintenance practices, such as the infrequent review and updating of metadata systems.

In conclusion, the study establishes that improving indigenous knowledge preservation requires a comprehensive and strategic approach. There is a need for culturally responsive and adaptable metadata frameworks, enhanced capacity building for library personnel, improved technological infrastructure, and stronger institutional policies. Furthermore, meaningful collaboration with indigenous communities is essential to ensure that preserved knowledge remains authentic, relevant, and sustainable for future generations.

Recommendations

Based on the findings, Nigerian university libraries need to adopt more flexible and culturally responsive approaches to metadata for preserving indigenous knowledge. Existing standards such as Dublin Core and MARC 21 provide a useful foundation, but they should be adapted to capture important aspects of indigenous knowledge, including its cultural context, local languages, provenance, community ownership, and appropriate access conditions.

Greater attention should also be given to forms of indigenous knowledge that are often overlooked, particularly oral traditions, indigenous languages, traditional medicine, folklore, and community practices. Libraries should make better use of audio, video, and other digital formats to ensure that these forms of knowledge are preserved in ways that reflect how they are traditionally shared and experienced.

There is also a need to strengthen the skills of library professionals through regular training in metadata creation, digitisation, digital curation, and preservation. This should be supported by adequate technological infrastructure, sustainable funding, and clear institutional policies covering the collection, preservation, access, ownership, and ethical use of indigenous knowledge.

Most importantly, indigenous communities and knowledge holders should be actively involved in the preservation process. Their participation can help libraries ensure that indigenous knowledge is accurately described, properly contextualised, and preserved with due respect for cultural values and community rights. Stronger collaboration among university libraries, researchers, cultural institutions, professional bodies, government agencies, and indigenous communities would further support the development of consistent practices and sustainable approaches to indigenous knowledge preservation.

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