



Opportunities in implementing research data management in academic libraries in Nigeria

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Abstract

Background: The study was carried out to investigate opportunities in implementing research data management, in academic libraries in Nigeria. in Nigeria.

Purpose: The study focused on federal and state universities in Nigeria, to determine opportunities in implementing RDM in Academic Libraries.

Methodology: The study adopts Systematic Literature Review. The review question was formulated as: What are the opportunities in implementing research data management in Nigerian universities? To retrieve relevant articles, various sources were used. The search strategy combined controlled vocabulary and free-text terms, using Boolean operators such as OR and from 2020-2026.

Results: The study revealed that implementation of RDM in Nigerian universities holds significant benefits such as capacity building and training, collaboration and partnerships, policy development, increased funding opportunities, enhanced research quality, and increased research visibility and impact.

Conclusion: The study concluded that only 11 (18%) universities in Nigeria implemented RDM in their libraries..

Implications: The implications of the study show that implementation of RDM in academic libraries in Nigeria can bring several opportunities such as funding, national policy push, ICT infrastructure, collaboration and capacity building.

Keywords: *Academic Libraries, opportunities, implementation, Research Data Management, Nigeria.*

Introduction

The rapid growth of digital research activities across higher institutions has increased the volume of research data generated by scholars, thereby making Research Data Management (RDM) an essential component of contemporary academic scholarship. According to Adekoya, et al (2024), RDM refers to the organization, storage, preservation, sharing, and reuse of research data throughout its lifecycle, to ensure accessibility, integrity, and long-term usability. Globally, academic libraries have expanded their traditional roles from information provision to becoming active partners in research support, through the implementation of RDM services. These services assist researchers in managing research outputs, complying with funding requirements, and promoting open science

practices.

One major opportunity in implementing RDM in Nigerian academic libraries is the increasing availability of digital technologies and network infrastructures. Advances in cloud computing, institutional repositories, digital preservation systems, and metadata management tools have made it possible for libraries to store, organize, and provide access to large volumes of research data. The establishment of digital platforms such as the Nigerian Institutional Repository and Identity System (NIRIS) has further provided a national framework for data preservation, sharing, and visibility of scholarly outputs, thereby creating an enabling environment for RDM implementation in Nigerian universities.

Another significant opportunity lies in the evolving role of librarians as research partners and data stewards. Contemporary librarians are



increasingly acquiring competencies in data curation, metadata creation, digital preservation, and research support services. These emerging professional responsibilities position librarians to provide guidance on data management planning, data documentation, data sharing, and compliance with institutional and funding agency requirements. Studies have shown that RDM presents opportunities for librarians to strengthen research facilitation, promote scientific communication, and enhance their relevance within the academic community.

Capacity-building initiatives and professional development programs also present opportunities for successful RDM implementation. Recent literature emphasizes the growing need for data literacy among librarians and researchers. Training programs in data management, data analytics, digital preservation, and emerging technologies can equip library professionals with the necessary competencies to manage research data effectively. The development of data literacy skills among librarians is considered a critical factor in achieving sustainable RDM services in university libraries (Igbinovia, Segun-Adeniran, & Okuonghae, 2025).

In view of the above, John, Amos & Joseph (2026), found that emerging technologies such as artificial intelligence, big data analytics, and machine learning are creating new possibilities for research support and knowledge management within academic libraries. These technologies can improve data organization, retrieval, analysis, and preservation, thereby enhancing the effectiveness of RDM services. Nigerian academic libraries have highlighted the potential of technological innovations to transform research support services and strengthen knowledge management practices within higher education institutions.

Institutional collaborations and partnerships also provide valuable opportunities for implementing RDM in Nigerian academic libraries. Universities can collaborate with national research organizations, international funding agencies, and research networks to develop policies,

infrastructures, and best practices for research data management. Such partnerships can facilitate resource sharing, technical support, staff training, and funding opportunities necessary for sustainable RDM implementation. Evidence from recent studies suggests that international collaborations can strengthen RDM capacity and promote the adoption of global best practices within Nigerian academic institutions. The study aims to identify opportunities for implementing RDM in academic libraries in Nigeria. The figure below shows the total number of the universities that implement RDM and those that don't implement in Nigeria:

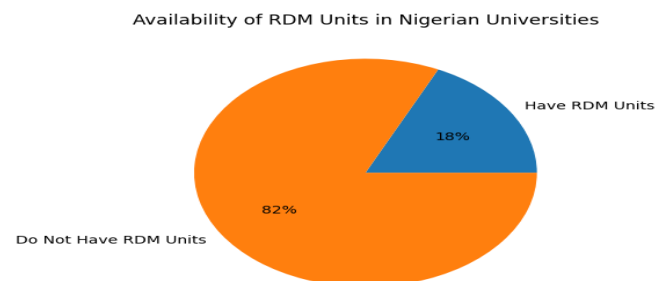


Figure 1: Universities with RDM Units and those without RDM Units in Nigeria (Preliminary Survey, 2024)

Research Objectives

1. To identify how many academic libraries have an RDM unit in Nigerian universities;
2. To determine opportunities in implementing research data management in academic libraries in Nigerian universities;

Literature Review

The review was done in order to discover current trends on the subject matter and identify knowledge gaps that exist under the following variables:

I. Opportunities for Implementation of RDM in Nigeria

The implementation of Research Data Management (RDM) in academic libraries in Nigeria presents numerous opportunities for enhancing research and knowledge dissemination. By adopting RDM practices, libraries can improve data accessibility, preservation, knowledge sharing and enhance collaboration among researchers and universities, locally and globally (Alabia, 2025). RDM also enables compliance with funding agencies' requirements and supports evidence-based decision-making in academic and policy environments. However, advancements in digital technologies and growing awareness of the importance of RDM offer significance for universities in Nigeria by improving the visibility of the research and preserving local researches for future use.

In view of the above, Adewumi & Oluwasola (2019), identified the following opportunities for adoption of RDM:

- **Technological Advancements**

Advances in technology offer significant opportunities for enhancing RDM practices in Nigerian academic libraries. The adoption of cloud storage solutions, digital repositories, and advanced data management software can significantly improve data storage and accessibility (Adewumi & Oluwasola, 2019).

- **Capacity Building and Training**

Investing in capacity building and training programs for librarians and researchers can address the skills gap. Initiatives such as workshops, seminars, and certification courses can enhance the expertise of library staff in RDM (Adewumi & Oluwasola, 2019).

- **Collaboration and Partnerships**

Establishing collaborations and partnerships

with international organizations, other academic institutions, and funding bodies can provide the necessary resources and support for RDM implementation. Such collaborations can facilitate knowledge exchange and the sharing of best practices (Nwalo & Eze, 2022).

- **Policy Development**

The development and implementation of comprehensive RDM policies at the national and institutional levels can standardize practices and ensure compliance. Clear policies can guide the management, sharing, and preservation of research data (Adewumi & Oluwasola, 2019).

- **Increased Funding Opportunities**

Access to national and international grants and funding opportunities dedicated to RDM initiatives can alleviate financial constraints. Funding can support infrastructure development, capacity building, and the procurement of necessary technologies (Adewumi & Oluwasola, 2019).

Similarly, Chiware (2020), opined that implementation of RDM holds significant benefits in the following ways:

- **Enhanced Research Quality and Integrity**

Proper RDM ensures data is organized, preserved, and accessible, improving the overall quality and reliability of research. This allows for the verification of results and reproducibility of studies, fostering a culture of transparency and accountability in research (Chiware, 2020).

- **Increased Research Visibility and Impact**

Effective RDM practices facilitate the sharing and dissemination of research data, increasing the visibility of Nigerian research globally. This can lead to higher citation rates and greater academic impact (Chiware, 2020).

- **Efficient Data Sharing and Collaboration**

RDM enables efficient data sharing and collaboration among researchers, both locally and internationally. Standardized data management practices support seamless data exchange, enhancing collaborative research efforts (Sinha, Subaveerapandiyar, & Sinha, 2023).

- **Support for Open Science Initiatives**

RDM practices align with open science principles, promoting open access to research data. This openness can attract funding, partnerships, and collaborations from international bodies and enhance the reputation of Nigerian academic institutions (Chiwara, 2020).

- **Improved Data Security and Compliance**

Implementing RDM ensures that research data is securely stored and managed, protecting it from loss or unauthorized access. It also helps institutions comply with legal and ethical standards for data management (Chiwara, 2020).

However, Sinha, Subaveerapandiyar and Sinha (2023), revealed that RDM provides opportunities for the professional development of library staff. Training in data management skills, such as metadata creation and data curation, equips library professionals with the expertise needed to support researchers effectively. Thus, effective RDM ensures the long-term preservation of research data, making it available for future research and historical reference. Thus, implementation of RDM in Nigerian academic libraries has several opportunities that can be leveraged to improve RDM practices. It can be concluded that implementation of RDM in academic libraries in Nigeria offers significant opportunities to enhance research efficiency, collaboration, and knowledge sharing. Thus, embracing RDM practices will not only improve data accessibility

and preservation, but also contribute to the global research community, reinforcing the role of Nigerian academic libraries as catalysts for innovation in academic libraries in Nigeria.

II. Implementation of Research Data Management in Nigeria

The implementation of research data management (RDM) in Nigerian universities has received growing scholarly attention, reflecting both emerging opportunities and persistent challenges across disciplines and institutional types. Studies consistently frame RDM as a systematic approach to handling research data across its lifecycle, to ensure availability for reuse, verification, and replication within the scientific community. In view of the above, Alabi (2025) reveals mixed levels of RDM maturity among Nigerian academics. Chemistry researchers in the five specialized federal universities of technology demonstrate a good conceptual understanding of research data and its importance to research findings, yet report frequent irrecoverable loss of data due to poor storage device choices, inadequate backup methods, and weak data protection systems. While the library is identified as the most preferred place for long-term data preservation, trust deficits and fears of loss of ownership to unauthorized persons hinder deposit behavior, and no formal data management plans are used during scientific research.

Similarly, David & Abbas (2020) conducted a survey on university lecturers in South-South Nigeria, where they examined data management practices and their relationship with educational research effectiveness, indicating that data practices are increasingly linked to research output quality among academic staff. However, broader surveys show that many lecturers are not aware of big data management tools and do not know how to use big data management system tools, with adoption driven mainly by increasing data volumes and spread of technology. As such, university libraries are positioned as central

actors in RDM implementation. Research on Federal University Libraries in Northwest Nigeria identified that libraries apply management strategies across data generation, organization, storage, and dissemination (Odigwe, Bassey & Owan, 2020).

Thus, common strategies for data generation include policy advocacy, donations/gifts, purchase/subscription, and appeals to faculties, while repositories, portable storage devices, and computers are used for organization and storage. Dissemination occurs via library/university websites, email, Web 2.0 tools, and radio stations. The study concludes that libraries should continue supporting universities' efforts to manage knowledge assets through constant updates to suitable technological platforms, with more attention given to building reliable and sustainable institutional repositories. Other evidence from South West Nigeria confirms that academic librarians are familiar with RDM and actively assist researchers with data management plans, collaborate with IT departments, and provide data storage solutions.

However, Eneh, Oviri & Opara (2021) opined that Institutional Repositories (IRs) are the dominant technical infrastructure for RDM in Nigerian universities. A survey of IRs in Nigeria found that most use DSpace software, and about half engage in information migration, with a majority providing long-term digital preservation. Critically, most IRs lack a digital preservation policy and suffer from inadequate long-term funding and limited technical staff. Utilization studies show that IRs influence research productivity of lecturers in federal universities, and LIS academics frequently access open educational resources and use IRs for teaching, research, and course materials, though challenges include power outages, untimely repository updates, and prolonged search times. Broader data challenges for African libraries include limited internet access, limited bandwidth, and limited resources, which

constrain data collection, management, and interaction.

It can be seen from the review that a knowledge gap exists as a result of absence of formal data management plans among researchers, inadequate policy frameworks for digital preservation, and low awareness/utilization of advanced data tools among lecturers. Recommendations emphasize the need for information technology leaders to demonstrate the importance of big data management systems in strategic plans and to address skills gaps among academic staff. The integration of big data analytics into library operations is also proposed as a way forward to improve resource transfer and personalized services.

Conceptual Framework

Conceptual framework consists of concepts and propositions about how concepts and theories are related to a particular study, using an established model. The conceptual framework of the study explores the opportunities in implementing RDM in academic libraries in Nigeria, which is grounded in relevant theories. The study is underpinned on the following two theories:

1. Diffusion of Innovations Theory: This theory was proposed by Rogers in 2003, and explains how, why, and at what rate new ideas and technologies spread through cultures. In the context of RDM, this theory helps understand how new RDM practices and technologies are adopted by academic libraries in Nigeria. The theory further explains that the adoption of an innovation depends on users' perceptions of its relative advantages, its compatibility with existing values and practices, its level of complexity, and the degree to which its outcomes are observable to others.:

2. Resource-Based View (RBV) Theory: This theory was proposed by Barney in 1991. It emphasizes the importance of an organization's

internal resources and capabilities. Applied to academic libraries, RBV suggests that libraries must leverage their unique resources such as skilled personnel, technological infrastructure and institutional support, to effectively implement RDM practices. The theory also sheds light on the importance of acquiring and developing these resources to overcome challenges in Implementing RDM.

The conceptual framework presented above integrates the Diffusion of Innovations Theory and the Resource-Based View (RBV) to examine the opportunities for implementing Research Data Management (RDM) in academic libraries in Nigeria. By applying these theoretical perspectives, the framework identifies the factors that can facilitate the successful adoption and implementation of RDM practices. It also provides a basis for library administrators, policymakers, and other stakeholders to develop effective strategies, allocate resources, and formulate policies that support sustainable RDM implementation in Nigerian academic libraries. The conceptual framework is illustrated in the diagram below.

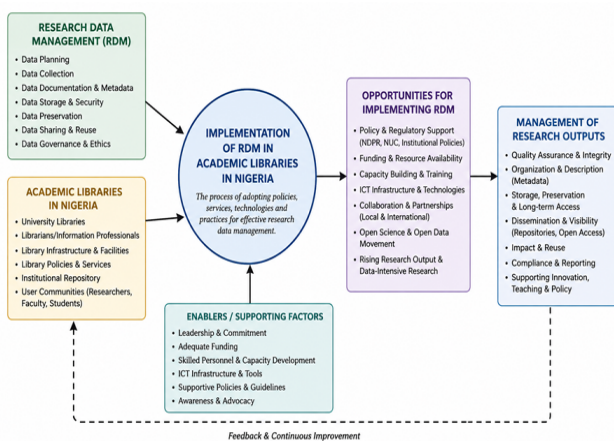


Figure 1: Conceptual Framework of Implementation of RDM in Academic Libraries in Nigeria

PRISMA Diagram of the study

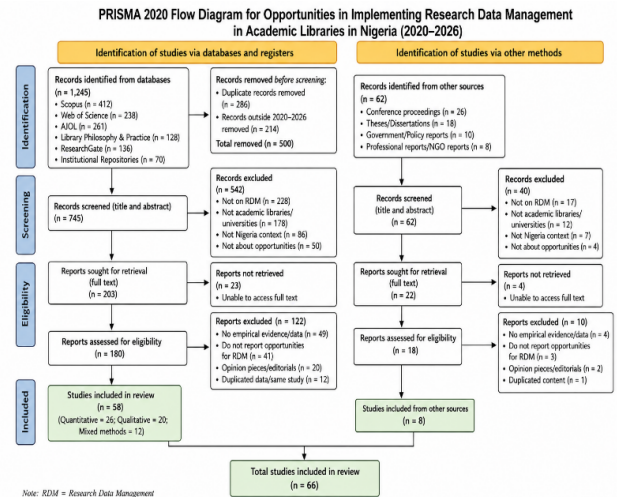


Figure 3: PRISMA Flow Diagram of Opportunities in Implementing Research Data Management in Academic Libraries in Nigeria (2020-2026)

Methodology

The study adopted a systematic literature review (SLR) approach to ensure transparency, replicability, and minimization of bias in retrieving and synthesizing literature on research data management implementation in Nigerian universities, published between 2020 and 2026. The review question was formulated as: What are the opportunities in implementing research data management in Nigerian universities from 2020 to 2026?

To retrieve relevant articles, a comprehensive search was conducted across multiple electronic databases, including Scopus, Web of Science, AJOL (African Journals Online), Library Philosophy and Practice, ResearchGate, and institutional repositories of Nigerian universities to capture both peer-reviewed journal articles and relevant grey literature such as conference proceedings, theses, and technical reports. The search strategy combined controlled vocabulary and free-text terms using Boolean operators: ("research data management" OR "RDM" OR "data management" OR "research data" OR "data stewardship") AND ("academic libraries" OR "university libraries" OR "higher education" OR "universities") AND (Nigeria OR Nigerian).

To restrict the timeframe to the last five years, database filters were applied to include only records published from 2020-2026, and an additional manual check of publication dates was performed during screening, to exclude studies outside this range. Inclusion criteria

were applied specifically on that subject area, while exclusion criteria were applied to eliminate opinion pieces without data, research, opportunities and management. Therefore, full texts of potentially eligible studies were then retrieved and assessed independently. Data extraction was performed using a pre-designed form to capture author, year, study aim, methodology, population, key findings on RDM implementation, and identified challenges or opportunities. The entire search process, including number of records identified, screened, excluded, and included, was documented to ensure auditability. Synthesis of findings followed a narrative approach due to heterogeneity in study designs, with results thematically organized around RDM opportunities and implementation in Nigerian universities.

Findings

The study investigated opportunities in implementing Research Data Management in Academic Libraries in Nigeria. The study found that only a few universities in Nigeria have implemented RDM in their libraries: University of Ibadan, Ahmadu Bello University, University of Lagos, University of Nigeria, Obafemi Awolowo University, Lagos State University, Ekiti State University, Nasarawa State University, Keffi (NSUK), National Open University of Nigeria (NOUN) and Federal University Dutse. This implies that only 10 (16.4%) of universities in Nigeria have implemented RDM in their libraries. The study also found that implementation of RDM in Nigerian universities holds significant benefits in the following aspects: capacity building and training, collaboration and partnerships among libraries, policy development, increased funding opportunities, enhanced research quality and integrity, increased research visibility and impact, effective data sharing and collaboration, support for open science initiatives, improved data security and compliance.

Discussion and Conclusion

The study concluded that very few academic libraries in Nigeria have Research Data Management and the commitment for the implementation of RDM in their libraries is less.

The study also concluded that the few academic libraries that implemented the RDM encountered various challenges, such as lack of awareness, lack of skilled personnel, inadequate funding and lack of technological infrastructure. The study further concluded that implementation of RDM in academic libraries in Nigeria can bring several opportunities to the libraries, librarians, researchers and the institutions.

Recommendations

Based on the above findings, the following recommendations were made:

Develop a standardized RDM policy across academic libraries in Nigeria.

Nigerian universities should prioritize training and continuous professional development in RDM for their staff, through workshops, online courses and collaborations with other institutions.

Create awareness campaigns on the benefits of RDM to academic staff and researchers.

Nigerian universities should acquire modern ICT infrastructure, including high-speed internet, secure servers, and cloud storage solutions, in order to store and preserve research data.

Secure funding from diverse sources, including governmental research grants, international donors, and institutional budgets so the academic libraries could also explore cost-effective solutions like open-source RDM tools and platforms.

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