# INNOVATIVE TECHNOLOGIES FOR RECORDS MANAGEMENT IN MINISTRIES, DEPARTMENTS AND AGENCY LIBRARIES IN NIGERIA.

BY

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## Abstract

*In the era of digital governance, effective records management is essential for transparency, accountability and efficient service delivery in public sector. With the increasing demand for open government and e-governance, Ministries, Departments and Agencies (MDAs) are under pressure to enhance their records management capabilities through the integration of digital innovations. To this effect MDAs, libraries are adopting technology driven systems to manage their records. This paper explained the different innovative technologies used by libraries in MDAs to be; Cloud computing technologies, Artificial intelligence, Electronic document and records management systems (EDRMS), Blockchain technologies, Mobile technologies, Optical character recognition and scanning technology (OCR), Radio frequency identification technology (RFID), Institutional repositories and digital archives. The paper also highlighted the key challenges facing the adoption of innovative technologies to records management in the libraries to be infrastructure and technical issues, inadequate funding and slow policy implementation. However, the way forward to this challenge is to provide adequate funds through budget allocation to the library, there should be provision of more infrastructures and regulatory bodies on records management should endeavor to implement policies that will encourage effective records management using modern technology.*

**Keyword:** Agency, Departments, Innovative Technologies, Libraries, Ministries, Records Management

## Introduction

Technological advancement has transformed how organisations carry out their activities, one of which is the records management practices. It is believed that efficient records management is critical to attaining transparency, accountability and effective service delivery in any organisation. However, in today's digital environment, the transformation from paper-based record keeping system to electronic-based record keeping system is very important. According to Duke library (2025), records management is a field of management that governs how organisations create, receive, store, use, access and dispose all records regardless of its format. The society of American archivists (2025) sees records management as the systematic and administrative control to records throughout their life cycle to ensure efficiency and economy in their creation, use, handling, control, maintenance and disposition. Ukunegbu (2013) stated that records managements helps organisations to be efficient, effective, accountable and transparent. Organisations that develop and maintain a sound and well-planned records management programme are efficient and they work at peak performance, very effective and they operate in an atmosphere of openness and inclusiveness. The adoption of modern technologies has changed the management of records in organisations including libraries. According to Oseni (2022), when technologies are applied to records management in offices, it ensures a quick accessibility and usability of records. Read and Grinn (2017) believed that more businesses are investing in new technologies in order to deal with the increasing number of records which is as a result of the current explosion in information creation. Records management in the public sector plays a vital role in supporting decision-making, preserving institutional memory and complying with legal and regulatory requirements (International Records Management Trust [IRMT], 2009). However, many government agencies still face challenges such as poor infrastructure, lack of skilled personnel and resistance to change, which hinders the effective deployment of technology-driven solutions (Ngulube, 2012). With the increasing demand for open governance and e-governance, MDAs are under pressure to enhance their records management capabilities through the integration of digital innovations. (Mutula & Wamukoya, 2009).

**Innovative Technologies used for Records Management in Libraries**

According to Haupert (2024) the records management industry is experiencing significant changes due to rapid pace in technological advancement. This means that organisations are using innovative technologies like; cloud computing, artificial intelligence, data analytics, mobile devices, blockchain technology to manage their records. Also, Innovation in technology have led to an increase in library records which are available in multiple format. When they are not properly managed, it can lead to delay or no access to the records. Therefore, the more efficient the management of library records, the more effective access is provided to them. According to Nwosu (2017), the challenges faced by libraries and other information centers in organising and managing their hybrid resources which include both print and electronic resources have led to the adoption of modern technologies. In the same vein, the integration of innovative technologies into records management is transforming how libraries within ministries, agencies and departments operates because as data volumes continue to increase there is need for effective data governance, risk management and compliance.

Innovative technologies such as Electronic Document and Records Management Systems (EDRMS), cloud-based platforms or cloud computing technologies, artificial intelligence (AI) and blockchain now offer government agencies more secure, accessible and reliable ways to manage information. In addition, these technologies enable digitisation, secure storage, automated classification and efficient retrieval of records, which improves service delivery and operational transparency. (Mwangi 2020 & Katuu, 2015).

**1. Cloud Computing Technologies**

One of the most significant information technology mode, that revolutionised the way records management is conducted is the cloud computing technology. According to Eneh (2024), libraries are increasingly turning to cloud computing to modernise their operations and services. Also, many organisations use cloud computing to store records in central location that is accessible from anywhere with Internet connection. Cloud computing in records management has improved collaboration, increased productivity and reduced costs associated with traditional document storage methods. Cloud computing has made it easier for records managers to ensure compliance with regulatory requirements, as records can be easily audited and tracked. According to Chigada and Madzinga (2017), cloud computing technology services offer scalability, remote access and disaster recovery for records and archives. (UNESCO 2021). Examples of cloud computing technologies used in records management are google cloud, Microsoft azure and amazon web services (Bello & Nwachikwu, 2021). Libraries in agencies, departments and ministries are using cloud computing technology to support hybrid record keeping, digital repository management and long-term preservation. According to NITDA (2022), agencies like national assembly libraries can use AWS Govcloud to manage legislative records which is a type of cloud computing technology. Govcloud are designed to prevent sensitive data leaks, and also helps one to handle huge numbers of users. Eneh (2024) revealed that cloud computing technologies helps libraries to maintain record data, private and delicate data. One advantage of using cloud computing is that it empowers libraries to adopt innovative technologies and services.

**2. Artificial Intelligence**

The records management industry is experiencing transformation through the use of artificial intelligence. Schreur (2020) explained that the advent of AI has brought transformative changes in domain, offering tools and solutions that enhances the efficiency and accuracy of records management. According to Osagie and Oladokun (2024), the integration of artificial intelligence tools in to the library systems represents a pioneering approach to enhancing the management and protection of records. Artificial Intelligence tools can analyse large amounts of data, identify patterns and provide insights that help organisations make informed decisions. AI powered software can help record managers identify duplicate records, classify documents and automate record retention and disposition schedules. Katuu (2020) opined that artificial intelligence enhances record classification, metadata tagging, search optimisation and predictive archiving. Libraries in ministries and agencies use artificial intelligence and machine learning technologies to supports automation in information retrieval and records lifecycle management. According to Modiba (2021), artificial intelligence technologies like natural language processing (NLP), computer vision, and predictive analytics offer unprecedented capabilities in automating routine tasks, detecting anomalies and ensuring integrity of both physical and digital records in libraries. One of the most significant contribution of AI to library records management is the automation of cataloguing and classification services . (Omigie & Anthony, 2023). The National library of Norway has implemented AI-driven digitisation projects to preserve its extensive collection of historical documents, also the New York public library uses AI to enhance its digital archives and improve search functionality (Osagie & Oladokun, 2024). Artificial intelligence further enhances records management by automating tagging, predicting retention schedules and improving information discovery through natural language processing. (IRMT, 2016)

3. **Electronic Document and Records Management Systems (EDRMS)**

With the proliferation of computers, organisation develop a lot of electronic records. The EDRMS is a technology that automate the creation, storage, retrieval, and disposal of records. The application of electronics into records management is overwhelming because it helps records to be preserved and reduced in sizes. They support compliance, security and workflow management in public institutions. Examples of EDRMS used for records management are SharePoint, Laserfiche, alfresco, open text. According to Iwhiwhu B (2010) ministries, departments and agencies use EDRMS to streamline process and audit records with centralized access. Ogundipe (2024) revealed that many MDAs adopted electronic records management systems to automate workflows and manage their born-digital records. According to Okonedo (2020) federal agencies like corporate affairs commission and federal inland revenue service use EDRMS to digitize paper records, automate workflows, and enhance retrieval process. Also, EDRMS facilitates centralized access to records, version control and audit trails, which are crucial for maintaining the integrity and authenticity of official information. (ISOd, 2016)

4. **Blockchain Technology**

Blockchain technology is a decentralised digital ledger that is used to secure records transactions. Records managers use it to ensure the authenticity and integrity of records. According to Jha (2023), blockchain technology is a fresh and dependable technology that aids in security, reliability and preservation of information, which can be used to safeguard library records, retrieve library documents and improve collection management. Block chain technology can be used to track the chain of custody for records and ensure that records have not been tampered with. Lemiuex (2016) opined that blockchain technology ensures immutability, transparency, and traceability of records, especially for auditing and security. Libraries and archives use blockchain technology to promote trust and integrity in public records handling, by improving security, transparency and efficiency. Libraries can create auditable trails for all activities, by preventing unauthorised data modification and ensuring data integrity. Some libraries use blockchain technology as a tool for securing and tamper-proof records, particularly in areas like land registration and procurement documentation. (Kshetri, 2018). However, Owubiko (2025) is of the view that blockchain technology has the potential of revolutionising management practices in libraries, this because the integration of blockchain technology in to library operations improves the state of security, enhances transparency and accessibility of library collections and thereby transforming the bounders of digital preservation and intellectual property management.

5. **Mobile Technologies**

Libraries in MDAs use mobile technologies to manage library records through mobile application like SMS notification, web-based interfaces that are optimised for mobile devices. Mobile platforms enable easy access to records, especially in remote locations or field offices. For example, federal ministry of agriculture library use USSD/SMS-based retrieval for agricultural records (World Bank, 2020). According to Ojedokun and Moahi (2014), agricultural libraries in ministries use mobile technologies to facilitate mobile cataloguing, scanning and digital lending as part of their records management, retrievals, due dates for files or required action on sensitive documents. Ekong (2021) further explained that, libraries used SMS alerts to notify staff about records. Examples of mobile technologies used for records management in MDAs libraries are smartphones, tablets, mobile applications, cameras.

These technologies allows staff to capture high quality images or PDFs of physical documents, forms directly from the field or at a point of receipt(NARA, 2022).

6. **Optical Character Recognition and Scanning Technology**

Optical character recognition (OCR) is a technology that enables libraries to digitise paper records into editable and searchable digital formats. According to Mnjama (2011), OCR supports digital transformation and legacy records conversion. The National archives of Nigeria (2021) explained that, national war museum library use OCR to digitise colonial records. Other MDAs libraries use OCR and scanning technology to digitise and manage their records by converting physical documents into searchable and editable digital formats. This helps in enhancing accessibility, preservation and easy searching of library collections.

7. **Radio frequency identification technology**

This is a cutting-edge technology that utilises electromagnetic fields to automatically identify and track tags attached to objects. (Comport communications, 2025). Radio frequency identification technology can be used to track and manage physical records using radio waves, thereby offering advantages in efficiency and accuracy over manual records. According to Mamdapur (2011)radio frequency identification technology is an innovative automated library system for automatic identification and tracking of library material. It is predicted that this technology will replace the barcode systems used in the library. According to Viji (2024) the use of radio frequency identification technology (RFID) in intelligent library management is a cutting-edge strategy that leverages RFID power to improve many aspects of library operations one of which is records management. This innovative technology introduces a more automated and simplified approach to managing library resources like records by seamlessly integrating RFID tags, readers and software solutions. Libraries in MDAs use radio frequency identification technology to identify and track library materials and records. The RFID technology is used to ensure security of records, real time inventory and easy location of classified or circulating records. (Oyewole & Adetimirin,2015).

8. **Institutional repositories and digital archive**

One of the innovative approaches to records management within MDAs libraries is the use of institutional repository and digital archives. These technologies provide improved access to records, efficient preservation of records and effective management of records. According to Ezema (2013), library repositories preserve and provide access to institutional records and publications. Libraries in MDAs use repositories and digital archives to manage grey literature, policy documents and internal reports emanating from the parent organisation where the library is established. Examples of the repositories are DSpace and EPrints.

**Challenges faced by libraries in MDAs in using innovative technologies for records management**

With Innovation in technologies revolutionising how operations are carried out in different organisations, libraries are not left behind. However, libraries are facing some challenges when integrating innovative technologies for records management. (Ngoepe & Saurombe, 2016). These challenges are as follows:

**1. Infrastructure and technical issues**

According to WorldBank (2023) many libraries in MDAs lack infrastructures, such as reliable power supply and limited broadband Internet connectivity, lack of proper storage facilities for digital resources as such, it hinders the adoption of the various technology for records management. Also, some lack skilled staff with technical expertise to manage and troubleshoot new technologies.

**2. Inadequate funding**

Another key challenge faced by the libraries is on the lack of adequate funds. Most of the libraries in the MDAs are not adequately funded, but rather some of them rely on donor projects from World Bank and UNESCO. The lack of funds hinders them from purchasing and maintaining new technologies.

**3. Policy Implementation**

Another challenge faced by libraries in adopting innovative technology for records management is on the slow implementation of policies from government regulatory bodies. (National policy on records management, 2017).

**The Way forward**

Based on the challenges faced by the libraries while adopting innovative technologies in managing records, the following suggestions were made.

1. There should be adequate funding from the parent organisation where the library is established through the provision of more funds in their annual budgetory allocations.
2. There should be provision of more infrastructures in the libraries so as to enable them to use the new technologies and also provide more training for the staff.
3. Regulatory bodies should endeavor to implement policies on effective records management practices using modern technologies.

## Conclusion

In concession, the use of innovative technologies in managing records in MDAs libraries, significantly enhances access, security, transparency and preservation of government information. These technologies aligned with the digital transformation agenda and global practices in public records management.

## REFERENCES

Bello, S & Nwachikwu, C (2021). Evaluating cloud technologies for records management in government agencies. *JIST* ,10(4).

Chigada, J. & Madzinga, R (2017). Cloud computing: An enabler for effective records and archives management in developing countries. *Information development,* 33(3). Available at https://doi.org/10.1177.

Comport communication (2025).RFID technology: a complete guide on how it works, where it is used. Available at https://.comport.com

Duke library (2025). *What is record management.* Available at https://library.duke.edu.

Ekong, U. E. (2021).Mobile SMS technologies for government records alerts: a Nigerian context. *Journal of information development,* 37(1). Available at https://doi.org/10.177

Eneh C.A, Oviri B.U & Ekhorotuwen, M. (2024). save in cloud, access anywhere: the utilisation of cloud computing in university libraries for library services delivery in contemporary age Niu.*Journal of Educational* Research, 10(1).

Ezema, I.J. (2013). Local content and the development of open access institutional repositories in Nigerian university libraries, *Library Hi Tech,* 31(2). Available at https://doi.org/ 10.1108.

Haupert, D. (2025). *Information technology trends in impacting records management*. Available at https://acesscorp.com

International records management trust IRMT (2016). Managing records as *a reliable evidence for ICT/E-government and freedom of information in East Africa. London: IRMT.*

International Organization for Standardisation ISO (2016). Information and documentation of Records management. *Geneva*: ISO.

Jha, S.K. (2023). Application of blockchain technology in library and information centres services Library in tech news. Available at www.google.com.

Katuu, S. & Mwengi, (2015). Thinking digital records in global environment: a review of the Literature. *The electronic library,* 33(2). Available at https://doi.org/10.1108/EL.

Kshetri, N. (2018). Blockchain's roles in meeting key supply chain management objectives. *IJIM* 39. Available at https://doi.org/10.1016/j.ijinfomgt.2017.12.005.

Lemieux, V.L (2016). Trusting records: Is blockchain technology the answer? *Records Management Journal,* 26(2). Available at https://doi.org/10.1108/RMJ-12-2015-0042.

Mamdapur, N.M. & Rajgoli, U.I. (2011). Implementing radio frequency identification technology in Libraries: advantages and disadvantages. Available at www.researchgate.net.

Mnjama, N. (2011). Archives and records management in Kenya: problems and prospects. *Records management journal,* 21(2). Available at https://doi.org/10.1108

National archives and records administration NARA (2022). Managing records in mobile applications. Available at https://www.archives.gov/recordsmanagement/policy/ managing mobile-app-records.

National archives of Nigeria (2021). Annual technical report on digitisation. Available at https://nan.gov.ng/reports/

Ngoepe, M & Saurombe, A (2016) Provisions for managing and preserving records created in Networked environments in the archival legislative frameworks of selected member states of the Southern African development community. Archives and manuscripts, vol 44(1).

NITDA (2022).Cloud computing policy implementation framework. Available at https://nitda.gov.ng/wp-content/uploads/2022/03.

Ogundipe, A.O (2024). Managing digital records within Nigeria's regulatory framework. International journal of science and research archive. Vol 12(2). Available at https/idoi.org.

Ojedokun, A. A. & Moahi, K.H. (2014). The use of mobile phones for accessing agricultural Information by farmers in southern Nigeria. AJLAIS, 24(1).

Okonedo, S. & Bamigbola, A. (2020). Digital preservation of public records in Nigeria. *IJIM* 54. Available at https://doi.org/10.1016/j.ijinfomgt.2020.102188

Omigie, C.A. & Anthony, O.S. (2023). Exploring artificial intelligence for records and archival Management system for Nigerian public organisation. *IJLOLSE*, 29(2).

Oseni, S. ,Ohikere, R. & Alli, A. (2022). ICTs as a tool for records management and security improvement in business organizations. *Proceedings of the 1st conference of the National institute of office, administration and information managers.*

Owunbiko, E.C. (2025). Blockchain technology as a tool for effective library services in the digital Era: a conceptual analysis. *IJLIS,* 2(1) available at https://www.ejournal.org.

Oyewole, O.& Adetimirin, A. (2015). RFID technology in libraries: A comparative study of private and public university libraries in Nigeria. *The electronic library.* 33(6). Available at https://doi.org/1108/EL-01.

Reed, J. & Grinn, M. (2017). *Records management:* Thompson south western publishers. Ohio.

Schreur, P.E. (2020).The use of linked data and artificial intelligence as key elements in the transformation of technical services. *Cataloguing and classification quarterly journal 58(5)*. Available at https://doi.org.

Society of American records management (2025). Records management. Available at https://dictionary.archivist.org.

Ukunegbu, T. (2013). Capacity building requirements for e-records management. Records management journal. Available at https://www.naa.gov.au.

UNESCO (2021). *Digital transformation of public service delivery in Africa: opportunities and challenges*. Paris: UNESCO

Wamukoya, J. & Mutula, (2009). Records and archives as basis of good governance: Implication and challenges for records managers and archivist in Africa. *Records management journal.*

World Bank (2020). Nigeria digital agriculture project. Available at https://projects.worldbank. org.

World bank (2023). impact of infrastructure on development outcomes. Worldbank policy research Working paper. Available at https://documents1.worldbank.org

Viji C. (2024). *Intelligent library management using radio frequency identification.* Available At www.researchgate.net