Journal of
Distance Learning and Open Learning
Print ISSN : 2314-8829 Online ISSN2314-8837

Integration of Artificial Intelligence into the Planning and Management of Records in Open and Distance Learning Institutions in Nigeria

Ailakhu, Ugonna Vivian
Department of Library and Information Science
Faculty of Education National Open University of Nigeria, Abuja.
vailakhu@noun.edu.ng
Ambrose, Smart Eromosele
Department of Library and Information Science
Faculty of Education ational Open University of Nigeria, Abuja
sambrose@noun.edu.ng
Kalu, Nkata Uka
Department of Library and Information Science
Faculty of Education National Open University of Nigeria, Abuja
nkkalu@noun.edu.ng

Abstract:

Integration of artificial intelligence (AI) into the planning and management of records in open and distance learning (ODL) institutions represents a transformative shift towards efficiency, effectiveness, and innovation. As a result, this study aims to dig into the ever-changing landscape of records management practices in the age of AI by conducting a critical analysis of existing trends, effective techniques, and potential future developments. This study examined the integration of artificial intelligence into the planning and management of records in Nigerian open and distance learning (ODL) institutions. This paper uses a narrative review method to

analyze current records management practices, future AI directions, data security benefits, policy considerations, ethical considerations, and the challenges in open and distance learning institutions. Artificial intelligence (AI) has significantly improved record planning and management in Nigerian decentralized open and distance learning (ODL) institutions. However, ethical use, privacy protection, and compliance with privacy legislation remain challenges.

Open and distance learning institutions should use AI technology to improve automated data management, forecast trends, and guide decision-making. AI technology can also help with records administration, allowing data-driven decisions about enrollment, course development, resource allocation, and academic support services for open and distance learning institutions. AI technology may also provide strong security measures to protect sensitive student information while adhering to data privacy rules, ensuring data security and access.

In conclusion, Open and Distance Learning institutions are integrating AI into records management, aiming to improve efficiency, innovation, and ethical considerations. Successful implementation requires strategic planning, infrastructure investment, and industry collaboration.

Keywords: Artificial Intelligence, Records management practice, Open and Distance Learning institutions, Nigeria.

Introduction

A paradigm shift in the planning and management of records has been brought about as a result of the growth of Artificial Intelligence (AI) technologies in the contemporary environment of information management. Redefining traditional approaches to records administration in order to take advantage of the capabilities of artificial intelligence is becoming increasingly common as businesses struggle to cope with the exponential rise of data and the increasingly complex legal requirements.

Artificial Intelligent technologies, encompassing Machine learning, natural language processing, and cognitive computing are all examples of artificial intelligence technologies that are contributing to a change in the way that businesses manage their records. According to Jones and Choo's (2020), these technological improvements make it possible to automate the classification, extraction, and analysis of information from enormous data repositories, which in turn makes record management operations more efficient and accurate. Furthermore, AI-driven insights enable organisations to generate actionable intelligence from their data, which in turn helps to influence strategic decision-making and enhances operational efficiency (Bertino *et al*., 2019).

On the other hand, incorporating AI into records management operations creates new difficulties and aspects to consider. One of the most essential of them is the obligation to ensure the ethical and responsible use of artificial intelligence algorithms in the administration of sensitive records, the protection against biases, and the guarantee of compliance with privacy legislation. Universities are embracing AI, particularly in record management, which is important for ODL institutions. Artificial intelligence can help with decentralised record management issues by improving efficiency, data accuracy, and accessibility. It also plays a crucial role in data security and compliance, and it has the potential to lead to innovative AI applications in records administration that will help both open and distance institutions. (Wang &Madnick, 2021).

In order to effectively harness developing capabilities while limiting risks connected with records management practices, open and distant learning institutions will need to continuously adapt and innovate their records management methods. This is because of the dynamic nature of artificial intelligence technology. This study explores the potential of AI in record planning and management, particularly in decentralized ODL institutions. It examines current trends, successful strategies, and future advancements to navigate the digital era's interface with AI in records management.

Review of related literature

Current Records Management Practices in Open and Distance Learning Institutions in Nigeria

Records management at Nigeria's Open and Distance Learning (ODL) institutions is critical to ensuring the effective and successful administration of educational programmes. These educational institutions, distinguished by their unique method to providing instruction to students who are not physically present on campus, have a number of challenges and opportunities when it comes to record management. The methodologies that are now used in the administration of records within Nigerian ODL institutions are as follows:

Digitalization of Records: ODL institutions in Nigeria have increasingly been transitioning from paper-based records to digital records management systems. This shift is driven by the need for efficient storage, retrieval, and management of vast amounts of academic and administrative data. (Ezema, 2018)

Adoption of Electronic Document Management Systems (EDMS): Many ODL institutions have implemented EDMS to streamline their records management processes. These systems facilitate the capture, storage, indexing, and retrieval of electronic documents, ensuring easy access and compliance with regulatory requirements. (Adebayo & Adeola 2019)

Compliance with Regulatory Standards: ODL institutions in Nigeria are required to adhere to regulatory standards for records management, such as those set by the National Universities Commission (NUC) and other relevant government agencies. Compliance ensures accountability, transparency, and the preservation of institutional memory. (NUC, 2020)

Capacity Building: Institutions invest in training and capacity building programs for staff members involved in records management to enhance their skills and knowledge of best

practices. This includes workshops, seminars, and certification programs focused on records management principles and techniques. (Ogunsola & Abioye, 2017)

Records Retention and Disposal: ODL institutions develop and implement records retention schedules to determine the appropriate retention periods for different categories of records. This ensures compliance with legal and regulatory requirements while facilitating the systematic disposal of obsolete records. (Ezema, 2018)

Security and Confidentiality: Given the sensitive nature of academic and administrative records, ODL institutions prioritize the security and confidentiality of records through access controls, encryption, and other security measures. This safeguards the integrity and privacy of information stored within their systems. (Adebayo & Adeola, 2019)

Integration of Records Management into Institutional Policies: ODL institutions incorporate records management principles into their overarching institutional policies and procedures. This integration ensures that records management is recognized as a strategic priority aligned with the institution's goals and objectives. (NUC, 2020)

Continuous Improvement: ODL institutions regularly review and evaluate their records management practices to identify areas for improvement. This may involve conducting audits, soliciting feedback from stakeholders, and benchmarking against industry standards to enhance efficiency and effectiveness. (Ogunsola & Abioye, 2017)

Future Direction for AI in Records Management Practice in Open and Distance Learning Institutions in Nigeria

Artificial intelligence (AI) has the ability to completely transform the way Open and Distance Learning (ODL) institutions in Nigeria manage their data when applied to records management methods. Artificial intelligence (AI) has the potential to significantly

improve accessibility, security, and efficiency as these institutions grow and embrace new technologies. A number of potential future uses for artificial intelligence in the administration of records at ODLs in Nigeria are as follows:

1. Automation of Records Management Processes: AI-based technologies can automate various records management processes, such as classification, indexing, retrieval, and archival. This automation can significantly enhance efficiency, accuracy, and speed in managing vast amounts of digital records generated in ODL institutions. (Ailakhu, 2023).

2. Machine Learning for Predictive Analytics: According to Nguyen and Zain (2023).Machine learning algorithms can analyse previous data and forecast future patterns in records management requirements. Predictive analytics can help ODL institutions forecast storage needs, optimise resource allocation, and improve information governance methods. Predictive analytics and artificial intelligence can be used to foresee trends and requirements in records management. This can result in proactive record management, the ability to anticipate future requirements, and the capacity to make educated decisions about record retention and disposal.

3. **Enhanced Search and Retrieval Capabilities**: AI-powered search engines can produce more accurate and contextually relevant search results from the huge record repositories of ODL institutions. Advanced techniques, such as semantic search and entity recognition, can help to improve search query precision. Artificial intelligence-powered search engines can enhance information retrieval by comprehending the context and semantics of user queries. This makes it simple for students and staff at ODL institutions to access records as needed. (Modiba, 2022).

4. **Robust Security and Compliance Measures**: Unlike traditional antivirus software and firewall protection, robust security measures involve a diverse strategy to protect digital assets against a spectrum of threats. This technique is superior to the protection

offered by existing security measures. This all-encompassing strategy addresses weaknesses on a variety of different levels inside the system. Open and Distance Learning (ODL) educational institutions prioritise the protection of sensitive data due to their decentralised student base and reliance on digital platforms. AI can significantly strengthen ODL's cyber defenses by identifying and eliminating risks to sensitive data while also ensuring compliance with data protection standards such as the General Data Protection Regulation (GDPR) and the Nigeria Data Protection Regulation (NDPR). (Opz & Ariah, 2024).

5. Intelligent information Management: Artificial intelligence has the potential to improve the process of automatically producing and maintaining information for records. This includes metadata that is descriptive, administrative, and structural in nature. This not only guarantees that metadata standards are consistent, but it also makes it easier for diverse systems and platforms that are utilised in ODL institutions to interact with one another. (Ogiela & Ogiela, 2018).

6. Natural Language Processing (NLP) for Document Understanding: According to G.G. Chowdhury (2005). Natural Language Processing (NLP) provides a wide range of text and document analysis applications. Instead of translating languages into English, digital workers can effectively handle a wide range of commonly used languages, beginning with their home tongue. As a result, a wide range of text and document analysis applications become viable. Natural Language Processing (NLP) techniques can be used to extract valuable insights from unstructured textual content found in documents. This function is extremely beneficial to online learning institutions since it allows for the analysis of student comments, course materials, and research papers, which facilitates decision-making processes**.**

7. Personalised Content Recommendations: Customised recommendations enable content authors to have a more profound understanding of their audience. Customised content suggestions

can help content producers gain a deeper understanding of their audience and adapt their material to align with their consumers' desires and preferences. Artificial intelligence algorithms can assess user activity and preferences in an open and distant setting to offer tailored content recommendations to different users, such as students and faculty members. Tailoring relevant educational resources to each individual's specific needs and interests can enhance the learning experience. (Liang, Lai, & Ku, 2006).

8. **Ethical and Responsible AI procedures:** As artificial intelligence technologies become more integrated into records management procedures, organisations that deal with open-access documents (ODL) are required to prioritise ethical issues. Among these are the implementation of transparent algorithms for artificial intelligence, the guaranteeing of fairness and equity, and the protection against bias in decision-making procedures. (Cotton, Cotton & Shipway, 2023).

9. Initiatives for Capacity Building and Training: Investing in capacity-building programs and training staff in AI for records management in ODL institutions is crucial. These programs cover AI tools, data analytics, information governance, and cyber security. AI can enhance user experience by providing automated assistance and tailored recommendations, allowing users to quickly access record systems and access information through chatbots and virtual assistants. (Williams & Patel, 2021)

Opportunities Artificial Intelligence Provides for Data Security in Open and Distance Learning Institutions

Artificial Intelligence (AI) not only plays an important role in establishing and maintaining data security in open and distance learning institutions across Africa, but it also gives opportunities for data security in these institutions. It contributes significantly to the improvement of data security within African open and distance learning institutions by providing advanced threat detection, authentication systems, encryption solutions, predictive analytics, automated incident response, and user behaviour analytics. When

open and remote learning institutions use artificial intelligence technology, they can successfully protect sensitive data, ensure the privacy of users' personal information, and maintain the integrity of their virtual learning environments (VLEs) in the face of new cyber threats. (Nibigira, Havyarimana & Xiao, 2024).

Artificial intelligence (AI) will play an important role in improving data security measures in open and distant learning (ODL) institutions. They deliver cutting-edge solutions that address the cyber threats that ODL institutions are now facing. Because of the present surge in demand for online education, strong security methods are required to protect sensitive data.
ODL institutions are in charge of the development, receipt, and preservation of records; AI can be used in a variety of ways. Threat detection and prevention are critical applications of artificial intelligence in the realm of data security. (Oladipo *et al*., 2020). Intelligent systems powered by artificial intelligence continuously monitor network traffic, user activity, and system logs to detect anomalies that may suggest potential security breaches. Artificial intelligence uses machine learning techniques to detect any irregularities that have been identified. These algorithms can examine trends and identify suspicious conduct, such as attempts to acquire unauthorised access or anomalous data transmission (Liu and Jiang, 2019).

Artificial intelligence can bolster data security in open and distance-learning institutions by the ongoing surveillance of network traffic, user behaviour, and data to identify possible security breaches and proactively pinpoint questionable activities. As stated by Nibigira, Havyarimana & Xiao (2024). Here are a few instances of machine learning algorithms, driven by artificial intelligence, that are employed to avert the progression of possible dangers into significant security breaches:

1. **Behavioural biometrics:** Behavioural biometrics enables the utilisation of AI techniques for user authentication. Machine learning algorithms enable computers to monitor human activities

such as typing speed, mouse clicks, and navigation patterns in order to construct customised profiles. Instead of relying on easily compromised passwords or other traditional authentication methods, this approach enhances security by accurately identifying people based on their behavioural characteristics.

2. **Data Encryption and Privacy**: Safeguarding Privacy and Securing Data via Encryption Open and remote learning institutions can enhance their data security by adopting an encryption system powered by artificial intelligence. This solution provides strong security measures for safeguarding sensitive data that is sent and stored within open and remote learning systems. By employing artificial intelligence algorithms, these systems may automatically encrypt data as it is stored and being sent. This guarantees that in the event that unauthorised individuals, such as hackers, manage to obtain the data, they will be incapable of deciphering its contents without the appropriate decryption keys.

3. **Predictive Analytics for Risk Management**: This AI-powered predictive analytics tool is specifically developed to assist open and distance learning institutions in detecting and minimising potential server security issues before they escalate into significant concerns. This machine learning technique analyses past security incidents, system weaknesses, and emerging cyber threats. Predictive models have the ability to anticipate and predict future security challenges, and provide preemptive strategies to effectively address them. The institution's security architecture is enhanced by its proactive policy, which minimises the likelihood of data breaches and improves overall resilience.

4. **User Behaviour Analytics**: AI-powered user behaviour analytics allows ODL institutions to improve their data security by closely monitoring and studying the login actions of both staff and students in the virtual learning environment (VLE). This allows for the detection of possible insider risks, such as unauthorised access to Tutored Marked Assignment questions and Examination questions, as well as any malevolent intent. By correlating

behavioural patterns with security events, these systems can detect atypical user conduct that indicates the existence of insider threats. They thereafter take appropriate actions to prevent any unauthorised access or data leaking.

Harnessing AI for Enhanced Records Management Practice in Open and Distance Learning Institutions

Universities worldwide generate numerous records daily for legal, financial, and administrative purposes. Efficient administration of these records is crucial for fulfilling institutional needs. In today's tech-driven world, open and distance learning institutions must adhere to good records management practices to protect sensitive information, minimize risks, and ensure compliance. Artificial intelligence (AI) can revolutionize records management security by enhancing protocols and detecting, safeguarding, and governing data more efficiently. (Ailakhu, 2020).

Shi-Nash & Hardoon, (2016) suggest the following for improved records management practices:

1. Automatic tagging and classification: When records are classified manually, the process can be time-consuming and error-prone, resulting in discrepancies and wasted time. AI applications can use natural language processing (NLP) technologies to automatically identify and tag papers or articles based on their content and context. Metadata tags and labels, employed in automated classification and tagging, make records management easier and allow for more exact information organisation and retrieval.

2. Sensitive Data Detection and Redaction: In the digital age, open and remote learning institutions rely heavily on effective records management. Records management must prioritise the security of sensitive information, especially in businesses subject to tight laws. Sensitive Material Detection and Redaction is an artificial intelligence (AI) solution that can help you detect and remove personally identifiable information (PII) and other sensitive

material from documents using pattern recognition and machine learning. Automated detection of sensitive material decreases the possibility of data breaches while ensuring compliance with data protection rules.

3. Intelligent Access Controls: Intelligent Access Controls are the most effective way to handle student records in online and hybrid classrooms. If records managers want to keep their clients' information private and secure, they must implement suitable access controls. It improves access controls by using smart authentication methods to verify user identities and enabling fine-grained permissions such biometric recognition and behavioural analysis. It improves records management security by dynamically altering access rights based on user behaviour and context, reducing the risk of unauthorised access and insider threats.

4. Keep an eye out for abnormalities and potential threats: In records management, preventative risk mitigation is centred on detecting suspicious activity and potential security issues. Artificial intelligence-powered technologies use anomaly detection algorithms to monitor human behaviours, network data, and system interactions in real time. Because of the use of artificial intelligence, these systems can immediately notify administrators if they identify unusual activity or a potential security breach. Artificial intelligence (AI) technologies enhance records management systems' resilience to new threats by continuously monitoring and analysing them.

5. Predictive Analytics for Data Governance: By using AI to improve records management in ODL organisations, predictive analytics can help them anticipate and eliminate compliance problems. It is a security solution that uses artificial intelligence (AI) to detect regulatory trends, evaluate data quality, and discover compliance holes using predictive modelling and analytics. This publication is intended to help institutions take proactive steps to comply with regulations and reduce legal risks related with records management. Open and distance learning institutions operate in a

data-centric, more complicated environment, and these examples show how AI-based security technologies can help improve records management security. AI-powered solutions help open and distance learning institutions enhance their record-keeping processes, reduce compliance risks, and strengthen their defences against emerging cyber threats. This will help them ensure that their valuable information assets are secure, private, and easily accessible (Shi-Nash & Hardoon, 2016).

Comparative Analysis of Artificial Intelligence and Traditional Data Security

In today's hyperconnected world, protecting sensitive data from a variety of cyber-attacks is a major issue for both individuals and organisations. Traditional data security techniques, including as encryption, firewalls, access controls, and intrusion detection systems (IDS), have long formed the foundation of defence mechanisms. However, given the ever-changing threat landscape, the integration of artificial intelligence (AI) into security frameworks has emerged as a transformational method. (Aslan *et al*., 2023).

Artificial Intelligence in Data Security

Artificial Intelligence security systems use machine learning, natural language processing, and predictive analytics to improve threat detection, incident response, and risk reduction. These systems excel in adaptive threat detection, dynamically analysing patterns and anomalies to discover potential dangers in real time (Li *et al*., 2018). Behavioural analysis is an artificial intelligence element for data security in which algorithms examine user behaviour and network interactions to identify variations that indicate security vulnerabilities (Alzahrani *et al*., 2020). These predictive analytics enable AI models to identify potential security vulnerabilities based on past data and current trends, allowing for proactive risk reduction (Jin *et al*., 2019).

Traditional Data Security

When it comes to protecting sensitive information created, received, or maintained by institutions, standard data security methods like encryption, firewalls, access controls, and intrusion detection systems have shown to be dependable and successful. Encryption, for example, protects data confidentiality by encoding users' information using cryptographic techniques (Smith, 2017). According to Gupta et al.'s 2020 research, firewalls are used to manage network traffic by implementing predetermined rules, hence preventing hostile activities and unauthorised access. According to Liu *et al*. (2019), access controls are in charge of authenticating users, authorising access based on defined policies, and monitoring user rights in order to effectively prevent unauthorised data access. Intrusion detection systems (IDS) detect irregularities and probable security breaches by monitoring system operations and network traffic (Bhattacharya *et al*., 2019).

Comparative Analysis of Artificial Intelligence and Traditional Data Security

Effectiveness: In terms of effectiveness, traditional data security methods are effective in mitigating known threats; however, they may have difficulty detecting emerging or sophisticated attacks. On the other hand, artificial intelligence in data security systems excels in adaptive threat detection and behavioural analysis, which enables proactive defence against evolving threats (Tan *et al*., 2020).

Scalability: Traditional methods of data security rely heavily on manual intervention and configuration, which restricts their ability to scale and adapt to changing circumstances. On the other hand, artificial intelligence found in data security systems has the ability to scale dynamically and learn from data, which makes them ideally suited for threat environments that are both complex and constantly growing (Yang *et al*., 2019).

Adaptability: Artificial intelligence in data security systems is always learning and evolving, allowing it to adapt to new threats

and improve over time. According to Wang *et al*. (2018), traditional data security methods may need to undergo periodic upgrades and human tweaks in order to continue being successful against new threats. This could potentially result in protection gaps.

In general, both traditional data security measures and artificial intelligence play important roles in protecting sensitive information stored by institutions. The use of artificial intelligence in data security systems allows for more advanced threat detection and predictive analytics. Traditional data security provides a solid foundation for data security, and such qualities are critical for it. To build comprehensive security postures capable of effectively protecting against a wide range of cyber threats, open and distance learning institutions must combine the capabilities of both paradigms.

Traditional Methods of Records Management Practice in Nigeria

According to Oduwole & Onigbinde (2016), the majority of the traditional ways of records management practice in Nigeria are based on manual and paper-based systems. The generation or receipt of hard copy documents, such as letters, memoranda, reports, and forms, as well as their processing, maintenance, and storage, are all included in these two approaches. According to Oyelude, (2018), these physical records are often arranged in a chronological, numerical, geographical, or alphabetical fashion, and they are kept in filing cabinets or shelves for the purpose of facilitating efficient access and retrieval within the office premises. Record management techniques that are manual are considered to be conventional. These practices involve the management of records using manual processes, without the use of digital tools or technologies. This includes activities such as manually indexing, cataloguing, and filing documents, in addition to manually tracking the movement of records within organisations (Oduwole &Onigbinde, 2016). Having said that, this approach is prone to

problems such as the loss, destruction, or misplacement of papers, which can result in inefficiencies in the process of record keeping.

When it comes to keeping and protecting records, the traditional practice of records management in Nigeria frequently relies on hierarchical structures and centralised control methods. The creation of records, access to records and destruction of records are all subject to stringent standards, which are often governed by administrative procedures and regulations. On the other hand, these centralised systems can be inflexible and bureaucratic, which makes it more difficult to obtain information in a timely manner and to adapt to the ever-changing requirements of the organisation. Paper-based systems, manual processes, and centralised control mechanisms are hallmarks of the conventional techniques of records management practice in Nigeria. In general, these are the characteristics that define these approaches. Despite the fact that these procedures have been widely used for decades, they are now being challenged by the requirement for approaches to records management that are more effective, transparent, and driven by digital technology. (Ailakhu, 2020).

The Evolution of Records Management Practices with Artificial Intelligence in Nigeria

In recent years, there has been significant advancement in Nigeria's usage of artificial intelligence (AI) for records management. Artificial intelligence (AI) technologies have become essential in Nigerian open and remote learning institutions' (Adejuwon & Mabawonku, 2020)
fight against the ever-increasing data volumes that these institutions produce on a regular basis. Educational institutions in Nigeria that offer open and distance learning are embracing AI technologies to streamline record keeping. According to Adejuwon & Babawonku, (2020), these AI-powered applications efficiently sort, categorise, and retrieve documents by utilising machine learning algorithms and natural language processing (NLP).

Distance learning institutions in Nigeria are transforming the way they extract value from records using analytics tools powered by artificial intelligence. Adejuwon & Mabawonku, (2020) state that these technologies help analyse massive amounts of data, both structured and unstructured, to find trends, patterns, and outliers. This allows for data-driven decision-making, which in turn improves operational efficiency and service delivery. But there are other risks associated with using AI for records management, especially when it comes to sensitive personal information. Adejuwon & Madawonku, (2020) noted that open and distance learning institutions in Nigeria are increasingly using AI-based tools to handle sensitive information. However, they should be careful to comply with data protection regulations and put strong security measures in place to prevent data breaches and unauthorised access. A paradigm shift towards more efficient, data-driven methods to information governance has been represented by the evolution of records management techniques with artificial intelligence in Nigeria. Open and remote learning institutions must successfully handle the accompanying hurdles in order to fully utilise these technologies, despite the fact that they provide tremendous chances to improve records management systems and unlock important insights.

Benefits of Artificial Intelligence in Records Management Practice

The benefits of Artificial Intelligence in records management practices are several, remarkably in terms of efficiency, accuracy, and decision-making support. Automating records management processes like data classification and indexing, artificial intelligence systems can significantly reduce the time and resources required for managing records (Tasoulis *et al*., 2020). Artificial Intelligence algorithms can assist in analyzing large volumes of information at speed, facilitating the extraction of valuable insights from records that can inform strategic planning and operational improvements (Chen *et al*., 2020). Artificial Intelligence-powered records management systems offer organizations and institutions

the opportunity to optimize their information governance practices, ensuring compliance, efficiency, and informed decision-making. Effective records management offers significant benefits to open and distance learning institutions in Nigeria, contributing to improved efficiency, accountability, and decision-making processes (Oyewumi & Adigun, 2019). One key benefit of artificial intelligence in record management practice is enhanced operational efficiency through streamlined access to information.

In addition, artificial intelligence in records management practice promotes accountability and transparency within organizations (Ojo & Soetan, 2019). By capturing institutional knowledge and documenting best practices, organizations can mitigate the risks of losing valuable expertise due to employee turnover or retirement. This continuity of knowledge enables smoother transitions and supports ongoing innovation and improvement initiatives.

Artificial intelligence in records management in Nigeria offers numerous benefits to organizations, including enhanced operational efficiency, accountability, regulatory compliance, and knowledge preservation. Investing in robust records management practices is essential for organizations seeking to optimize their operations and mitigate risks in an increasingly complex business environment.

Challenges of Artificial Intelligence in Records Management Practice

Artificial intelligence, while essential for records management practice, also presents challenges. In Nigeria, records management faces numerous challenges, stemming from both systemic and infrastructural issues. One significant challenge is the lack of standardized practices across different sectors (Oyewumi & Adigun, 2019). For instance, government agencies, private companies, and educational institutions often employ disparate methods for recordkeeping, leading to inefficiencies and difficulties in information access and retrieval. This means that organizations and institutions must be adaptable and willing to

evolve with the emergence of artificial intelligence. Here are some challenges of artificial intelligence in records management practice:

1. Limited access to technology and internet connectivity: this hampers digital recordkeeping efforts, while unreliable power supply complicates the preservation of electronic records.

2. Shortage of skilled personnel: the unavailability of skilled personnel trained in modern records management techniques using artificial intelligence tools critically affects the management of records in organizations.

3. Absence of comprehensive legal frameworks and enforcement mechanisms: without clear regulations governing the creation, retention, and disposal of records, organizations struggle to develop robust recordkeeping practices, leaving valuable information vulnerable to loss or misuse.

Policy Consideration in AI-based Records Management Practice

In AI-based records management practice, policies are essential to provide guidelines and regulations for the responsible and ethical use of technology (Joshi and Bhattacharya, 2020). One critical aspect of policy is ensuring compliance with data protection laws and regulations, such as the Nigerian Data Protection Regulation (NDPR). These policies govern the collection, processing, and storage of personal data, including records managed using AI systems, and require institutions to implement appropriate security measures and obtain consent from individuals (Nwankwo & Aborisade, 2020).

Reasons for Policy Consideration in AI-based Records Management Practice:

1. Policies address issues related to transparency and accountability in AI-based records management. Institutions

need to be transparent about how AI algorithms are used to process records and make decisions, providing stakeholders with insights into the logic and implications of automated processes (Joshi & Bhattacharya, 2020).

2. Policies can promote fairness and non-discrimination in AI-based records management by establishing guidelines for the development and deployment of AI algorithms. Institutions should ensure that AI systems are trained on diverse and representative datasets to mitigate biases and ensure equitable treatment for all individuals (Nwankwo & Aborisade, 2020).

Ethical Consideration in AI-based Records Management Practice

Ethical considerations in AI-based records management Practice are paramount. It ensures that technology is used responsibly and in alignment with moral principles (Floridi *et al*., 2018). One critical ethical consideration is fairness, which entails ensuring that AI algorithms do not exhibit biases or discriminate against individuals based on factors such as race, gender, religion, tribe, or socioeconomic status (Kroll *et al*., 2017). Fairness requires careful consideration of dataset composition, algorithm design, and validation methods to mitigate biases and ensure equitable treatment for all individuals (Floridi *et al*., 2018).

Transparency is another essential ethical consideration in AI-based records management practice, emphasizing the need for institutions to be transparent about how artificial intelligence tools operate and the implications of their decisions (Jobin *et al*., 2019). It enables stakeholders to understand the reasoning behind automated decisions and to assess the reliability and validity of AI-driven processes (Floridi *et al*., 2018). Transparency fosters trust and accountability, empowering individuals to challenge decisions that may have adverse effects or ethical implications.

Accountability is a vital ethical principle in AI-based records management practice. It holdsinstitutions and organizations responsible for the outcomes of AI-driven decisions and the ethical implications of their actions (Floridi et al., 2018). It promotes ethical behavior and ensures that organizations uphold their obligations to individuals and society.

Privacy and data protection are crucial ethical considerations in AI-based records management practice, emphasizing the importance of respecting individuals' rights to privacy and autonomy (Floridi *et al*., 2018). Open and distance learning institutions must implement robust security measures and data protection practices to safeguard sensitive information and prevent unauthorized access or misuse (Jobin *et al*., 2019). Respecting privacy rights promotes trust and confidence among stakeholders and ensures that AI-based records management aligns with ethical norms and legal requirements.

Recommendations

Based on the discussions in this paper, the following recommendations are made to enhance the integration of Artificial Intelligence (AI) into the planning and management of records in open and distance learning institutions in Nigeria:

1. Open and distant learning institutions in Nigeria should use AI technology to automate, organise, and analyse data. This will improve the efficiency of record-keeping processes, allowing enormous amounts of data to be managed with greater accuracy and accessibility.

2. Institutions should use AI systems to analyse data in order to predict trends, discover patterns, and guide decision-making. By incorporating AI into records management, Nigerian open and remote learning institutions can make more informed decisions about enrollment, course development, resource allocation, and academic assistance.

3. Institutions should use AI technologies to build strong security measures that secure sensitive student information

while adhering to data privacy standards. AI-powered security solutions can protect papers from cyber threats and unauthorised access, preserving the integrity and confidentiality of student records.

Conclusion

In conclusion, incorporating artificial intelligence (AI) into record planning and management in open and distance learning (ODL) institutions is a revolutionary step towards increased efficiency, effectiveness, and innovation. When it comes to using artificial intelligence (AI) to speed records management procedures, Nigerian Open and Distance Learning (ODL) institutions confront both challenges and opportunities as the country's educational landscape continues to develop. The use of artificial intelligence-powered technologies to automate routine processes, improve document interpretation, promote predictive analytics, and optimise search and retrieval capabilities is the future of records management practices in Nigerian ODL institutions.

Furthermore, artificial intelligence has the potential to provide personalised content recommendations, stringent security measures, and ethical considerations, all of which are critical to the preservation of confidence and compliance in recordkeeping procedures. However, in order to successfully implement artificial intelligence in records management practice, strategic planning, infrastructure and training investments, collaboration with industry and research partners, and a firm commitment to ethical and responsible AI practices are required. Institutions that offer open and distance learning (ODL) should prioritise capacity-building programmes to equip their staff members with the knowledge and skills required to navigate the complexities of artificial intelligence-powered recordkeeping. Open and Distance Learning (ODL) institutions in Nigeria have the potential to revolutionize educational practices, improve decision-making procedures, and enrich the learning experience for both students and faculty members by adopting the future direction of artificial intelligence

in records management. Open and Distance Learning (ODL) institutions can confidently navigate the era of artificial intelligence by embracing innovation, encouraging collaboration, and upholding ethical standards, ensuring the efficient management of educational records for future generations.

Reference: _

Adejuwon, D., & Mabawonku, I. (2020). The Nexus between artificial intelligence and records management practices in Nigeria. In Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance. 281-286.

Ailakhu, U. V. (2023), Best practice in records management in open and distance learning (ODL): a case of National Open University of Nigeria (NOUN). *Library Philosophy and Practice*, (7559). University of Nebraska-Lincoln. Retrieved from https://digitalcommons.unl.edu/libphilprac/7559/

Ailakhu, U.V. (2020). Influence of human capacity building on records management effectiveness in registries of Federal Universities in South-West, Nigeria. *Ilorin Varsity International Journal of Library & Information Science.* Vol. 3 No. 2, pp.45-64

Alzahrani, A., Bell, D., & Zheng, L. (2020). A review of anomaly detection in networks: taxonomy, benchmarks, challenges, and future directions. *ACM Computing Surveys* (CSUR), 53(5);1-36.

Aslan, O, Aktug, S. S., Ozkan-Okay, M., Yilmaz, A. A., &Akin, E. (2023). A comprehensive review of cyber security vulnerabilities, threats, attacks, and solutions. *Electronics*, 12(6): 1333. https://doi.org/10.3390/electronics12061333

Bertino, E., Dagtas, S., Ferrari, E., & Atluri, V. (2019). AI, privacy, and personal data protection. *IEEE Transactions on Dependable and Secure Computing*, 16(6):975-978.

Bhattacharya, S., Sural, S., and Majumdar, A. K. (2019). A survey of biometric authentication techniques. *Journal of Network and Computer Applications*, 135:.62-80.

Chowdhury, G. G. (2005). Natural language processing. *Annual Review of Information Science and Technology*, *37*(1):51–89. https://doi.org/10.1002/aris.1440370103

Cotton, D. R. E., Cotton, P. A., &Shipway, J. R. (2023). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in Education and Teaching International*, *61*(2): 228–239. https://doi.org/10.1080/14703297.2023.219014

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazer, P., Dignum, V., & Luetge, C. (2018). AI4People-An ethical framework for a good AI society: opportunities, risks, principles, and recommendations. *Minds and Machines*, 28(4):689-707.

Gupta, D., Tiwari, A., & Bhatnagar, A. (2020). Design and implementation of intelligent firewall security system using machine learning techniques. *In Advances in Computing and Data Sciences*. 671-679.

Jin, Y., Chen, Y., & Xie, B. (2019). Deep learning for zero-day malware detection: a survey. *IEEE transactions on pattern analysis and machine intelligence*, 41(7):1667-1681.

Jobin, A., Ienca, M., &Vayena, E. (2019). The global landscape of AI ethics guidelines. *Nature Machine Intelligence*,1 (9):389-399.

Jones, G., & Choo, C. W. (2020). Artificial intelligence and records management: opportunities and challenges. *Handbook of Research on Managing Intellectual Property in Digital Libraries IGI Global.* 220-242.

Joshi, A., and Bhattacharya, S. (2020), Ethical and regulatory challenges in AI-based healthcare record management. *IGI Global.* 175-192.

Li, Y., Zhou, Z., Xu, J., &Yang, X. (2018). Deep learning for network intrusion detection: a survey. *IEEE Communications Surveys & Tutorials*, 20(1):418-448.

Liang, T.-P., Lai, H.-J., & Ku, Y.-C. (2006). Personalized content recommendation and user satisfaction: theoretical synthesis and empirical findings. *Journal of Management Information Systems*, 23 (3):45–70. https://doi.org/10.2753/mis0742-1222230303

Liu, L., Zhang, L., Chen, Y., & Wang, W. (2019). Access control with hierarchical attribute-based encryption. *IEEE Transactions on Dependable and Secure Computing*, 17(4):682-696.

Liu, Y., Zhou, Y., Cui, L., & Zhao, P. (2019). Deep learning for enterprise financial management: opportunities and challenges. *Journal of Management Analytics*, 6(4):506-522.

Modiba, M. (2022). Artificial intelligence for the improvement of records management activities at the Council for Scientific and Industrial Research. *Journal of the South African Society of Archivists*, 55, 16–26. https://doi.org/10.4314/jsasa.v55i.2

Nibigira, N., Havyarimana, V., and Xiao, Z. (2024), Artificial intelligence adoption for cybersecurity in Africa. *Journal of Information Security*, 15(2):134–147. https://doi.org/10.4236/jis.2024.152009

Nwankwo, E. U., & Aborisade, O. T. (2020). Data protection regulation compliance: a review of Nigerian organizations. In Proceedings of the Future Technologies Conference Springer, Cham, 1-16.

Oduwole, A.A., & Onigbinde, A.I. (2016). Records management in Nigerian public institutions: challenges and strategies. *Library Philosophy and Practice*, 1474.

Ogiela, M. R., & Ogiela, L. (2018). Cognitive cryptography techniques for intelligent information management. *International Journal of Information Management*, 40, 21–27. https://doi.org/10.1016/j.ijinfomgt.2018.01.011

Ojo, M. O., &Soetan, B. (2019). The role of records management in public sector reform in Nigeria: A study of Oyo State civil service. *International Journal of Information Management*, 49,13-21.

Opz, F. & Ariah, S. (2024). Implementing robust security measures in cloud infrastructure: strategies, best Practices, and emerging trends. Retrieved fromhttps://www.researchgate.net/publication/377925877

Oyelude, A.O. (2018). Records management practices in Nigerian Government Ministries, Departments and Agencies: a survey study. *Journal of the Nigerian Society of Information Professionals*, 12(1):29-40.

Oyewumi, A. S., &Adigun, J. A. (2019). Records management practice in Nigeria: a survey of the 20 Local Government Areas of Lagos State. *International Journal of Digital Curation*, 13(1):61-77.

Shi-Nash, A., & Hardoon, D. R. (2016). Data analytics and predictive analytics in the era of big data. *Internet of Things and Data Analytics Handbook*,329–345. https://doi.org/10.1002/9781119173601.ch19

Smith, W. D. (2017). Secure data transmission using quantum cryptography. *Journal of Computer Security*, 25 (2):135-159.

Tan, Z., Zhang, X., & Zou, X. (2020). Deep learning and its applications in biometrics. *Future Generation Computer Systems*, 112, 442-451.

Tasoulis, S. K., Harries, A., Karkaletsis, V. & Androutsopoulos, I. (2020). Machine learning and data analytics for legal tech and regulation. In Proceedings of the 28th ACM International Conference on Information and Knowledge Management. 468-477.

Wang, H., Wang, Y., Zhang, J., &Wei, D. (2018). Deep learning for malware classification using end-to-end autoencoders. In 2018 16th annual conference on privacy, security and trust (PST),IEEE. 1-8.

Wang, R. Y., & Madnick, S. E. (2021). AI, records management and digital transformation: an agenda for the future. *MIS Quarterly Executive*, 20 (1):1-10.

Wei, W., Barnaghi, P. M., & Andrzej Bargiela. (2007). *Semantic-Enhanced Information Search and Retrieval*. https://doi.org/10.1109/alpit.2007.59