

Artificial Intelligence Embedded Cloud Computing Technology for the Management of Digital Archives in the Fifth Industrial Revolution in South Africa

Mashilo Modiba and Mahlatse Shekgola

*Department of Information Science,
University of South Africa,
PO Box 392 Unisa 0003
South Africa
modibmt@unisa.ac.za
shekgmm@unisa.ac.za*

Abstract

Artificial intelligence embedded cloud computing technology can serve as a reliable storage for digital records in the fifth industrial revolution in South Africa. Some cloud storage facilities are embedded in the artificial intelligence powered electronic records management to ensure that digital archives and records are effectively managed and can be accessed anytime and anywhere as long as there is access to the Internet. Digital archives refer to the digitalised archival records and born digital archives that can be managed through artificial intelligence cloud computing technology. Artificial intelligence embedded cloud computing technology enables organisations to access and store information without managing their own physical devices or information technology infrastructure. Artificial intelligence refers to the use of intelligent robotic machines and AI powered software and applications to manage

digital archives through artificial intelligence powered cloud storage facilities. Cloud computing as technology means using Internet servers for storage, management, and processing of digital archives and records for the entire life cycle. This is a qualitative study, where content analysis was used as a research methodology. Themes such as artificial intelligence, cloud computing technology and digital archives were used to search for literature. The findings indicate that artificial intelligence embedded cloud computing technology can store digital archives and records effectively and they can be protected through encrypted passwords and security codes for security purposes. The digital archives can also be accessed anytime and anywhere through the use of smart computer technology. The study recommends a framework on how artificial intelligence embedded cloud computing technology can be used to manage the digital archives and ensure easy access to such digital archives in South Africa. It is hoped that organisations in South Africa can adopt the framework to utilise artificial intelligence cloud computing technology to manage their digital archives effectively and efficiently.

Keywords: Artificial Intelligence; Cloud Computing Technology; Digital Archives; Smart Computer Technology; Archival Access; Fifth Industrial Revolution.

Introduction and Background

Artificial intelligence (AI) embedded cloud computing technology serves as a dependable solution for storing and retrieving digital archives in the context of the fifth industrial revolution (5IR). Within this revolution, the archives and records management sector extensively employ AI embedded cloud computing technology to facilitate the seamless storage, retrieval, and automated disposal of digital archives (Nel-Saunders 2023). The 5IR encompasses the application of AI, robotic machines, cobots, cloud computing technology, the Internet of Things (IoT), and blockchain technology to effectively manage digital archives (Golic, 2019; George and George, 2023). According to Marcu and Marcu (2021), AI involves the use of AI-aided software and applications to digitally manage archives efficiently. Fifth Industrial Revolution (5IR) represents the synergistic partnership between AI and human intelligence (HI) in delivering efficient archival and records management services. It epitomises the collaborative efficacy of both AI and HI in ensuring the delivery of high-quality archival services. Distinguishing itself from the preceding 4IR, wherein intelligent machines can autonomously execute tasks, including archival duties, 5IR necessitates direct and sustained human involvement for the effective and efficient provision of archival services (Bhandari and Reddiboina, 2019).

Artificial Intelligence can be embedded in robotic machines and cobots (George and George, 2023); however, this study specifically explores the application of AI embedded cloud computing technology in digital archives management. The utilisation of AI is pivotal throughout the records life cycle and records continuum. Machine learning algorithms, deep learning algorithms, and natural language processing (NLP) algorithms play key roles in creating digital records, automating records classification, preservation, maintenance, and providing AI embedded cloud storage for the effective safeguarding of digital archives and records (EE Publishers, 2017; Modiba, 2021; and Modiba, 2022). Efficient management of digital archives is achieved through the integration of cloud storage facilities embedded in AI-aided electronic records management. These facilities ensure effective management and accessibility of digital archives and

records from any location with internet and data access (Shibambu and Ngoepe, 2020).

Digital archives encompass both digitised archival records and born-digital archives, and these can be effectively managed through cloud computing technology (Pillen and Max Eckard, 2023). Cloud computing empowers organisations to access and store information without the need to manage physical devices or maintain their own information technology (IT) infrastructure. This technology involves utilising the Internet servers for the storage, management, and processing of digital archives and records throughout their entire life cycle (Golightly, Chang and Liu, 2022). It provides a streamlined and efficient way for organisations to handle their data. Cloud computing technology, as a tool, allows organisations to access and store information without the necessity of managing physical devices or computer technology (Pratim, 2018). In an AI-aided cloud storage facility, cloud computing storage is established, enabling the storage and virtual access of data from multiple organisations simultaneously. A digital archive serves a purpose similar to a physical archive, preserving historical documents and objects that offer evidence of the past. In the digital realm, these archives are created through processes such as scanning with intelligent robotic machines or AI-aided photography, especially if the document was not initially created digitally. The digitalised materials are made available online through AI-aided software and smart computer technology, ensuring accessibility and dissemination (Vajcner, 2008).

Cloud computing is a term denoting the provision of on-demand computing resources, encompassing hardware, storage, databases, networking, and software, delivered to organisations and individuals over a network, typically the internet (Yao, 2017; and Mosweu, 2019). Artificial intelligence (AI) involves the use of intelligent robotic machines and AI-powered software and applications for the management of digital archives within AI-powered cloud storage facilities (Modiba, 2021). Digital archives and records stored in AI-aided cloud storage facilities are easily accessible, irrespective of location and time (Ahmadreza, Hossein and Alberto, 2020). Furthermore, digital records can be retrieved through integrated smart computer technology, enabling records practitioners and archivists to access records from any location (Modiba, 2021).

Organisations engaged in records management and offering cloud computing services typically employ a strategy of maintaining multiple copies of data to mitigate risks associated with security threats, data loss, and breaches. The cloud storage facility is further fortified through the integration of AI-embedded security software. In the event of unauthorised access detection, the system triggers an alert, promptly notifying the Information Communication Technology (ICT) section of the organisation about the incident (Tom et al; and Modiba, 2021).

Transitioning to AI-aided cloud computing provides organisations, regardless of their size, with the capability to enhance speed, agility, and foster innovation within their operations. The utilisation of AI-aided software and applications for accessing digital archives contributes to making organisations more competitive in their respective industries (Modiba, 2021). This shift to AI-aided cloud computing has fundamentally altered organisational work dynamics, communication processes, and collaboration methods, becoming increasingly essential for maintaining competitiveness in today's digital landscape. Cloud computing, rooted in Internet-based and AI technologies, employs virtual shared servers to offer software, infrastructure, platform devices, and other resources on a pay-as-you-use basis. This approach allows seamless access to digital archives, irrespective of location or time, thereby facilitating greater flexibility and efficiency (Higgins, 2008).

This study aims to explore the adoption and application of AI-embedded cloud computing technology for managing digital archives in the 5IR. A proposed framework is introduced to illustrate how organisations can effectively adopt and apply AI-embedded cloud computing technology for digital archives management in the 5IR.

Problem Statement

Numerous organisations face challenges in securing adequate and reliable storage facilities for the preservation of their digital records. A significant issue arises from the fact that many public organisations still rely on manual record management, leading to widespread archival storage problems (Shibambu and Ngoepe, 2020). Even

among organisations utilising electronic records management systems (ERMS), difficulties persist in preserving archives on local servers, primarily due to limited storage capacity, particularly when ERMS lacks integration with cloud storage facilities (Mosweu, Luthuli and Mosweu, 2019). The insufficiency of storage capacity in archival institutions contributes to records being scattered on the floors of record offices or archival custodies. Misplacement and improper shelving further complicate matters, making it challenging to locate and retrieve records under such conditions. Another notable issue is the lack of integration between manual and ERMS approaches, creating difficulties in effectively and efficiently preserving archives. Additionally, ERMS systems are prone to crashes caused by system overload. Consequently, the challenges outlined above make it challenging for the public to access archives in archival custody, ultimately impacting service delivery in the public sphere.

The integration of AI and cloud computing technology offers a promising solution to digitise and preserve archives effectively, utilising AI-aided cloud storage facilities. These facilities guarantee that public sector organisations can avail themselves of unlimited and sufficient cloud-based storage (Modiba, 2022). Access to digital records is facilitated through the internet and smart computer technology within AI-aided cloud storage setups. AI plays a pivotal role in enhancing these storage facilities dedicated to digital records within public institutions. The implementation of AI ensures an improved AI aided cloud storage infrastructure, enhancing accessibility and utilisation of digital archives stored in the cloud. Digital archives become accessible from any location, transcending time constraints. This ease of access promotes timely retrieval and utilisation of digital records, thereby enhancing service delivery, particularly within the public sphere (Modiba, 2022). Hence, this study intends to investigate the application of AI embedded cloud computing technology for the management of digital archives.

Purpose of the Study

The purpose of this study is to investigate the application of artificial intelligence (AI) embedded cloud computing technology for the management of

digital records in the fifth industrial revolution in South Africa. The following are objectives of the study:

- Assess the role of AI embedded cloud computing technology for the management of digital archives in the 5IR in South Africa.
- Evaluate the cloud computing models for the management of digital archives in the 5IR in South Africa.
- Identify AI embedded cloud computing technology infrastructure for the management of digital archives in the 5IR in South Africa.
- Propose a framework to use AI embedded cloud computing technology for the management of digital archives in the 5IR in South Africa.

Literature Review

The literature review for this study centres on the importance of AI embedded cloud computing technology in the administration and management of digital archives. It delves into various aspects, including models of cloud computing technology and the necessary AI embedded cloud computing technology infrastructure required for the effective management of digital archives.

The Role of Artificial Intelligence Embedded Cloud Computing Technology for the Management of Digital Archives

The integration of artificial intelligence (AI) with cloud computing, commonly referred to as AI embedded cloud computing, is a strategic approach aimed at optimising the efficient management of digital archives. AI tools and software are seamlessly synchronised with the capabilities of cloud computing, augmenting the value of the existing cloud computing environment. This synergy empowers organisations to proficiently handle and manage their digital archives (Collins et al; 2021).

Cloud computing enhances organisational agility, flexibility, and cost-effectiveness by hosting digital archival records in the cloud. The integration of AI further augments these advantages by providing intelligence to existing capabilities, offering an exceptional user experience, particularly in the realm of accessing and managing digital archives

(Ahamad et al, 2022). AI tools and applications running on the cloud play a pivotal role in the effective management of digital archival records. They contribute by identifying, updating, and cataloguing records, utilising intelligent robotic and cobotic machines. Additionally, AI tools aid in detecting fraudulent activities and identifying patterns that may appear anomalous within the system, thereby bolstering the security of digital archival institutions (Modiba, 2022). This magnificent combination of AI and cloud computing technology serves as a valuable asset for organisations involved in digital archives and records management (Modiba, 2021). AI not only offers enhanced flexibility in managing large archival repositories but also streamlines data, optimises workflows, and provides real-time insights to revolutionise day-to-day operations and redefine the end-user experience in digital archival institutions (Mosweu, Luthuli and Mosweu, 2019).

The integration of AI into cloud computing technology proves invaluable for the creation and management of digital archives. Digital records, once created, find a home on cloud facilities, facilitating seamless and efficient management (Sjödin et al, 2021). The authenticity and reliability of digital records are crucial, necessitating careful creation and management practices (Shibumbu and Ngoepe, 2020). Upon creation, these digital records are stored and accessed through cloud storage facilities, utilising AI-embedded infrastructure such as machine learning algorithms, automated digitisation algorithms, and natural learning algorithms (Modiba, 2021). Another significant aspect of AI embedded cloud computing technology is the secure and reliable distribution of digital archives. Digital archives originating from the client's end can be easily and securely transmitted to cloud servers, preserving integrity throughout the process. Access to these cloud services is essential for organisations to ensure that whenever digital records are stored, they are efficiently distributed to the cloud storage facility through AI-aided software and applications (Modiba, 2021; Modiba, 2022).

AI-embedded cloud computing technology serves a crucial role in the preservation of digital archival records. The regular storage of digital records through AI-embedded software and applications must be conducted securely, reliably, and

with traceability, ensuring long-term benefits (McLeod and Lomas, 2023). Furthermore, the digital records stored on AI-embedded cloud storage facilities can be seamlessly transferred to digital archives for preservation. In many instances, AI-embedded software and applications facilitate the robotic transfer of records to digital preservation, ensuring a systematic and efficient preservation process. Additionally, cloud computing technology proves instrumental in migration scenarios. When digital archives and records are moved from one cloud storage to another, it is imperative that they are not lost due to differences in cloud architecture. To address this concern, AI-embedded tools and applications can be employed to ensure a smooth and error-free migration process (Jaillant and Rees, 2022).

Redundant digital archives and records stored in AI embedded cloud storage should undergo secure and automatic destruction through programmed AI-embedded software and applications, such as machine learning algorithms (Jobin, Lenca and Vayena, 2019). This process ensures the safe disposal of unnecessary data, contributing to efficient storage management. Additionally, AI aided cloud computing technology offers a valuable backup solution. AI-embedded cloud storage facilities serve as reliable and secure backup storage in many organisations. This ensures the availability of digital archives, particularly during instances when other systems may fail to provide access. The synergy of AI and cloud technologies eliminates barriers to intelligent automation of archival records, enabling organisations to implement these advancements universally (Christie, 2020).

AI aided cloud computing technology provides organisations with the advantage of a pay-as-you-use model for managing digital archives, leading to substantial cost savings compared to the traditional approach of establishing and maintaining large data centers (Gabriel, 2020). The funds saved through this model can then be strategically allocated to the development of AI tools and accelerators. These investments not only contribute to generating greater revenue but also offer the potential to save fundamental costs for the organisation, particularly in the field of digital archives and records management (Hagendorff, 2020).

Cloud Computing Models for the Management of Digital Archives

Cloud computing models facilitate ubiquitous, convenient, and on-demand network access to a shared pool of resources. These computing resources can be rapidly provisioned and released with minimal effort. The primary types of cloud computing models include:

Infrastructure as a Service (IaaS) is the most common cloud computing service model and is particularly suitable for small and medium-sized organisations (Jaillant, 2019). It provides the fundamental infrastructure components, including virtual servers, networks, operating systems, and data storage drives, offering flexibility, reliability, and scalability to fulfilling the needs that many organisations seek with cloud computing, while eliminating the reliance on physical hardware. In the 5IR, IaaS aligns with smart technology, encompassing devices such as smart laptops, smartphones, and tablets. Additionally, intelligent robotic machines and cobots can be leveraged to manage both Platform as a Service (PaaS), such as AI-embedded records management systems, and Software as a Service (SaaS), such as AI-embedded databases. This integration enables quick access to digital archives (Corrado and Sandy, 2017).

Platform as a Service (PaaS) in AI aided cloud computing involves providers delivering the necessary infrastructure and software framework, allowing organisations to develop and run their applications. PaaS facilitates the rapid creation of web applications, providing a flexible and robust service to support them. Examples of PaaS include records management systems such as PandaDoc, Oneflow, Juro, Filecamp, eFileCabinet, Filemail, Alfresco, OnBase, FileHold, Rubex, Unidrive, Zoho Docs, Logical Doc, Microsoft SharePoint Online, M-File DMS, Ascension System, OnlyOffice, and Evernote Business. These platforms are designed to effectively manage digital archival records within organisations effectively and efficiently (Adel, 2022).

Software as a Service (SaaS) is a model where software and solutions are delivered to end-users as a service via the internet, rather than as products that need to be installed on users' computers or mobile devices (Shibambu, 2019). This cloud computing service model facilitates software deployment for

various businesses through a pay-per-use model. SaaS is centrally managed, relieving organisations from the burden of maintenance, making it ideal for short-term projects. Common examples include Google Drive, Dropbox, Sky Drive, Microsoft Form, and Google Docs, platforms that enable users to upload documents, collaborate, and create online surveys, providing diverse organisations with tools to manage their digital archives and records (Yan, 2017).

Artificial Intelligence Embedded Cloud Computing Technology Infrastructure of Management of Digital Archives

To effectively manage digital archives through the application of AI aided cloud computing technology, specific tools are essential for ensuring proper management. The necessary cloud computing technology tools include smart laptops, smartphones, smart tablets, networks, the internet, and AI embedded cloud storage facilities. Smart technology, encompassing smartphones, smart tablets, and smart laptops, plays a crucial role in the management and accessibility of digital records stored in AI aided cloud storage facilities (Masoud et al., 2019). Smart technology is characterised by the integration of computing and telecommunication technology into other technologies that lacked such capabilities previously. What defines a technology as “smart” is its capacity for automated or adaptive functionality and remote accessibility or operations from any location (Fanoro, Božaniæ and Sinha, 2021). Networks play a crucial role in facilitating the interconnection of technological devices utilised for managing and accessing digital archives within AI aided cloud storage facilities (Kumar, Tiwari and Zymbler, 2019). Computer networking involves the linkage of interconnected computer devices capable of exchanging data and sharing resources. These networked devices employ communications protocols – a set of rules – to transmit information via physical or wireless technologies (Masoud et al., 2019).

The Internet serves as a pivotal component, ensuring the virtual management and downloading of digital records by archivists and researchers. It constitutes a global system of interconnected computer networks that utilise internet protocols to facilitate communication among diverse networks and devices. Comprising private, public, academic,

business, and government networks of local to global scope, the internet employs a wide array of electronic, wireless, and optical networking technologies (Sanders and Scanlon, 2021). This global network allows digital archives to be accessed from anywhere, irrespective of time. The AI aided cloud storage facility serves as an online repository where digital archives and records can be virtually stored, enabling their management and access through networks, the internet, AI-embedded software and applications, as well as intelligent computer technology (Modiba, 2022).

Research Methodology

This qualitative study employs content analysis as its research methodology. The foundation of the research is built upon a comprehensive literature review, incorporating insights from the researchers’ experiences with the application of AI embedded cloud computing technology for managing digital archives. Themes and keywords such as “fifth industrial revolution,” “artificial intelligence,” “cloud computing technology,” and “digital archives” were employed in navigating the literature. The literature review process involved utilising various search engines, including Google Scholar, Research Gate, Web of Science, EBSCOhost, ScienceDirect, Springer, and Sage. These platforms were chosen for their ability to connect researchers to diverse websites hosting relevant information for the study. The search was refined using specified keywords, yielding a substantial number of literature sources. The researchers systematically navigated through the search results, often sifting through thousands of sources, to identify and access pertinent literature for the study.

Documents were meticulously identified and selected based on their relevance and utility to the study. The initial screening involved reading the titles and abstracts of generated articles, eliminating duplicates. In the second round, full-text articles that met the inclusion criteria underwent further review. The researchers employed the thematic analysis technique developed by Braun and Clarke (2006) to systematically analyse the qualitative data or text derived from prior studies. This analytical approach entails examining, synthesising, and interpreting the data by categorising it according to the key research objectives pertaining to the investigated topic. The

collected and extracted data from the included articles were then summarised and reported to foster a contextual and meaningful understanding of the issues under investigation. The resulting findings were organised into thematic categories such as “fifth industrial revolution,” “artificial intelligence,” “cloud computing technology,” and “digital archives.”

Findings of the Study

Artificial Intelligence embedded cloud computing technology plays a pivotal role in empowering organisations to effectively manage their digital archives within AI embedded cloud storage facilities. These archives become easily accessible through the use of smart computer technology and AI-aided software and applications, providing seamless access irrespective of location and time (Modiba, 2021). However, achieving unlimited access to digital archives stored in AI-aided cloud storage facilities necessitates a robust network and Internet infrastructure, coupled with AI-embedded software and applications, to cater to the needs of archivists and records practitioners.

In the field of AI-embedded cloud storage, digital archives can be effortlessly created, distributed, preserved, and migrated, leveraging the capabilities of AI-powered databases (Sjödín et al., 2021). The integration of AI-powered software and applications, including machine learning algorithms, facilitates secure destruction or disposal of digital archives from the AI embedded cloud storage facility when necessary (Modiba, 2021). To enhance security measures, digital archives stored in these facilities can be safeguarded with encrypted passwords and security codes.

Moreover, the AI embedded cloud storage facility serves not only as a repository but also as a reliable backup digital storage solution, offering an additional layer of data security and resilience (Christie, 2020). Infrastructure as a Service (IaaS) provides the necessary smart technology to manage digital archives effectively, while Platform as a Service (PaaS) encompasses computer programs designed to ensure efficient management. Software as a Service (SaaS) involves AI-powered software and applications, contributing to the effective and efficient management and access of digital archives, transcending temporal and spatial constraints

(Shibumbu and Ngoepe, 2020; and Adel, 2022). The convergence of these technologies within the AI-embedded cloud computing paradigm represents a comprehensive and sophisticated approach to digital archives management.

Conclusion

This study proposed a robust framework for the implementation of AI embedded cloud computing technology in the management of digital archives, aiming to provide unrestricted access to archival materials. The utilisation of an AI aided cloud storage facility enables seamless access to digital archives from any location, transcending temporal constraints. To harness the benefits of AI integrated cloud computing, users must establish connections to networks, the internet, and employ intelligent software and applications, thereby facilitating the downloading of digital archives from the AI aided cloud storage facility. In the pursuit of advancing archival practices, the researchers envision collaborating with national and provincial archives to advocate for the adoption and effective application of AI embedded cloud computing technology. By incorporating this innovative approach, archival institutions can enhance their efficiency and efficacy in managing digital archives. Subsequent to successful testing and integration within public archival sectors, private archival institutions are encouraged to consider the adoption and application of AI embedded cloud computing technology for the adept management of digital archives. This collaborative effort serves to propel the archival landscape into a technologically enriched future, ensuring the preservation and accessibility of historical and cultural records for generations to come.

Recommendations

This section introduces the proposed framework for leveraging AI embedded cloud computing technology in the administration and management of digital archives in South Africa. The integration of AI aided cloud computing technology holds potential advantages for the general public in terms of enhanced management and accessibility of digital archives. Utilising intelligent computer technology, networks, the internet, and AI-driven software and applications, digital archives can be efficiently

managed and accessed from any location, independent of time constraints, as illustrated in Figure 1. The framework is delineated with a focus on key components, including smart computer

technologies such as laptops, smartphones, and tablets, alongside networks, the internet, AI-powered software and applications, and the supportive infrastructure of AI-enhanced cloud storage facilities.

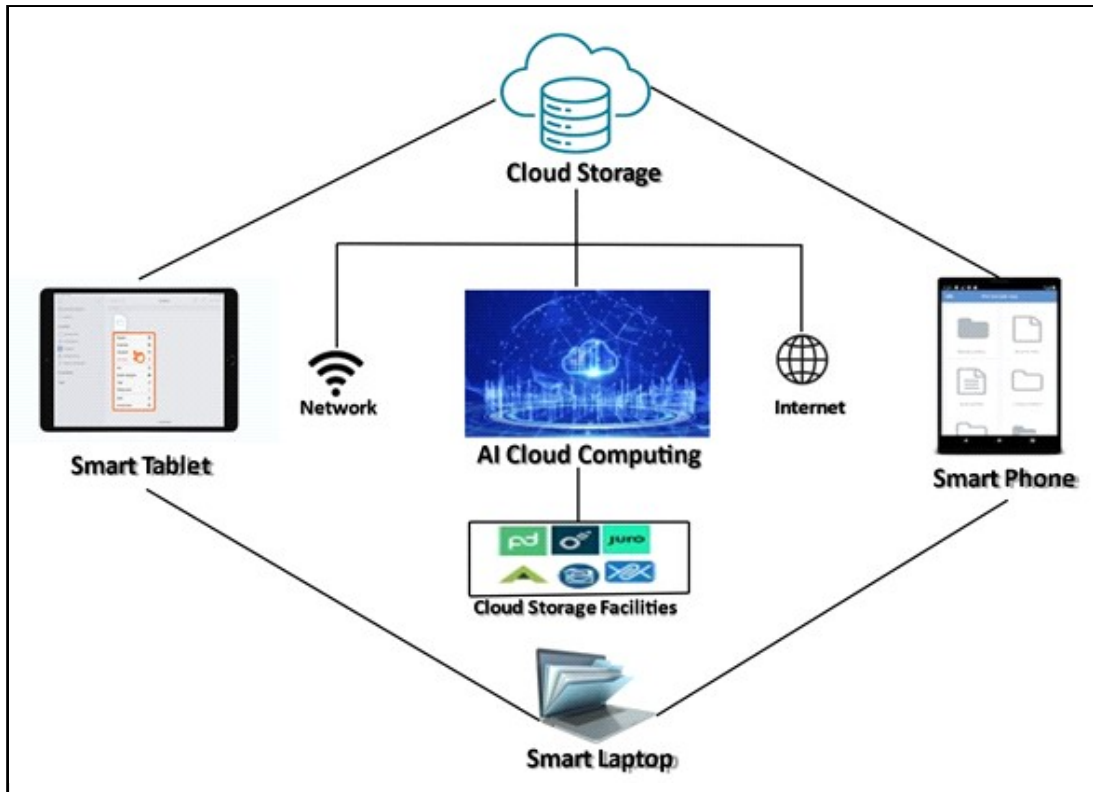


Figure 1: Framework to apply AI embedded cloud computing technology for management of digital archives in South Africa

This framework provides a comprehensive exploration of the application of AI aided cloud computing technology in the management of digital archives. The storage and accessibility of digital archives are facilitated through the integration of smart computer technologies, including smart laptops, smartphones, and tablets, as well as networks and the internet. AI-powered software and applications play a crucial role in this process.

Notably, smart technology extends its functionality to the creation and management of born digital archives, generated through platforms like emails and Microsoft Office. These born digital archives are seamlessly stored in the AI aided cloud storage facility through intelligent software and applications, ensuring efficient organisation and accessibility.

For access to these digital archives, a network and internet connection are imperative, enabling archivists and researchers to retrieve data from the AI embedded cloud storage facility. Archivists have the option to download the digital archives or store them locally on their phones, tablets, or laptops. Additionally, digital archives can be printed or shared via email, enhancing the versatility of the archival material.

The AI aided cloud storage facility serves not only as a primary repository but also functions as a robust digital backup storage solution. To bolster security, digital archives can be safeguarded with encrypted passwords and security codes, preventing unauthorised users from gaining access. This multi-layered approach ensures the integrity, accessibility, and security of digital archives within the sphere of AI embedded cloud computing technology.

References

- Adel, M. (2022). Future of Industry 5.0 in Society: Human-Centric Solutions, Challenges and Prospective Research Areas. *Journal of Cloud Computing: Advances, Systems and Applications*, 11(40)1-15.
- Ahamad, S., Mohseni, M., Shikhar, V., Smaisim, G.F., Tripathi, A. and Alanya-Beltran, J. (2022). *A Detailed Analysis of the Critical Role of Artificial Intelligence In Enabling High-Performance Cloud Computing Systems. 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)*. Greater Noida, India.
- Ahmadreza, M., Hossein, Y.M. and Alberto LG. (2020). Green Cloud Multimedia Networking: NFV/SDN Based Energy Efficient Resource Allocation. *IEEE Transactions on Green Communications and Networking*, 4(3)873-889.
- Arksey, H. and O'Malley, L. (2005). Scoping Studies: Towards A Methodological Framework. *International Journal of Social Research Methodology*, 8 (1),19-32.
- Bhandari, M. and Reddiboina, M. (2019). Augmented Intelligence: A Synergy Between Man and Machine. *Indian Journal of Urology*, 35(2) 89-91.
- Braun, V. and Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*,3(2) 77-101.
- Collins, C., Dennehy, D., Conboy, K. and Mikalef, P. (2021). Artificial Intelligence in Information Systems Research: A Systematic Literature Review and Research Agenda. *International Journal of Information Management*, 60:1-17.
- Christie, L. (2020). Interpretable Machine Learning (Postnote No. 633), UK Parliament, London. [Online]: <https://post.parliament.uk/research-briefings/post-pn-0633/> (Accessed 06 May 2023).
- EE Publishers. (2017). *Artificial Intelligence: Is South Africa Ready?* [Online]: <https://www.ee.co.za/article/artificial-intelligence-south-africa-ready.html> [Accessed 9 July 2019].
- Fanoro, M., Božaniæ, M. and Sinha, S. (2021). A Review of 4IR/5IR Enabling Technologies and their Linkage to Manufacturing Supply Chain. *Technologies*, 9 (4):1-33.
- Finances Online. (2023). Fifteen Best Cloud-Based Document Management Systems for 2023. [Online]: <https://financesonline.com/best-cloud-based-document-management-systems/> (Accessed 19 March 2023).
- Gabriel, I. (2020). Artificial Intelligence, Values, and Alignment. *Minds and Machines*, 30: 411–37.
- George, A.S. and George, A.S.H. (2020). Industrial Revolution 5.0: *The Transformation of the Modern Manufacturing Process to Enable Man and Machine to Work Hand in Hand*, Seybold Report, 15(9), 214- 234.
- Goliaë, Z. (2019). Finance and Artificial Intelligence: The Fifth Industrial Revolution and its Impact on the Financial Sector. *CORE*, 19, 67-81.
- Golighly, L., Chang V. and Liu, BSC. (2022). Adoption of Cloud Computing As Innovation in the Organization. *International Journal of Engineering Business Management*, 14:1-17.
- Hagendorff, T. (2020). The ethics of AI ethics: an evaluation of guidelines. *Minds and Machines*, 30: 99–120.
- Jaillant, L. and Rees, A. (2022). Applying AI to Digital Archives: Trust, Collaboration and Shared Professional Ethics. *Digital Scholarship in the Humanities*,00:1-15.
- Jobin, A., Ienca, M. and Vayena, E. (2019), Artificial Intelligence: the Global Landscape of Ethics Guidelines. *Nature Machine Intelligence*, 1: 389–99.
- Kumar, S., Tiwari, P. and Zymbler, M. (2019). Internet of Things is a Revolutionary Approach for Future Technology Enhancement: A Review. *Journal of Big Data*, 6 (111) :1-20.

- Masoud, M., Jaradat, Y., Manasrah, A. and Jannoud, I. (2019). Sensors of Smart Devices in the Internet of Everything (IoE) era: big opportunities and massive doubts. *Journal of Sensors*, 1:1-27.
- Marcu, L.G. and Marcu, D. (2021). Points of View on Artificial Intelligence in Medical Imaging – One Good, One Bad, One Fuzzy. *Health and Technology*, 11:17-22.
- McLeod, J. and Lomas E. (2023). Record DNA: Reconceptualizing Digital Records As The Future Evidence Base. *Archival Science*, [Online]:
<https://link.springer.com/article/10.1007/s10502-023-09414-w> (Accessed 05 May 2023).
- Modiba, M. (2022). Artificial Intelligence for the Improvement of Records Management Activities at the Council for Scientific and Industrial Research. *SASA Journal*, 55:16-26.
- Modiba, MT. (2021). *Utilising Artificial Intelligence for the Management of Records at the Council for scientific and industrial Research*. PhD thesis. Pretoria: University of South Africa.
- Mosweu, T., Luthuli, L. and Mosweu, O. (2019). Implications of Cloud-Computing Services in Records Management in Africa: Achilles heels of the digital era? *South African Journal of Information Management*, 21(1).
- Nel-Saunders, D. (2023). *Revolutionizing Public Private Partnerships: A transition to the Fifth Industrial Revolution*. School of Public Management, Governance and Public Policy. South Africa.
- Pillen, D. and Eckard, M. (2023). The Impact of the Shift to Cloud Computing on Digital Recordkeeping Practice at the University of Michigan Bentley Historical Library. *Archival Science*, 23:65-80.
- Pratim, RP. (2018). An Introduction to Dew Computing: Definition, Concept and Implications. *IEE Journals And Magazine*, 6: 723-737.
- Sanders, C.K. and Scalon, E. (2021). The Digital Divide is a Human Right Issue: Advancing Social Inclusion through Social Work Advocacy. *Journal of Human Rights Social Work*, 6 (2)130-143.
- Shibambu, A. and Ngoepe, M. (2020). When Rain Clouds Gather: Digital Curation of South African Public Records in the Cloud. *South African Journal of Information Management* 22 (1) 1205.
- Sjödin, D., Parida, V., Palmié, M. and Wincent, J. (2021). How AI Capabilities Enable Business Model Innovation: Scaling AI Through Co-Evolutionary Processes and Feedback Loops. *Journal of Business Research*, 134:574-587.
- Tom, E., Keane, P.A., Blazes, M., Pasquale, L.R., Chiang, M.F., Lee, A.Y. and Lee, C.S. (2020). Protecting Data Privacy in the Age AI – Enhanced Ophthalmology. *Translational Vision Science and Technology* 9 (2) 1-7.
- Yao, Y. (2017). The Application of Cloud Computing in the Management of Digital Archives in Colleges and Universities. *Advances in Computer Science Research*, 59:866-872.
- Yan, C. (2017). *Cloud Storage Services*. Master's Dissertation. Centria: University of Applied Sciences.

Mashilo Modiba is a Senior Lecturer in the department of Information Science, at the University of South Africa.



Mahlatse Moses Shekgola is a lecturer in the department of Information Science, at the University of South Africa

