

Infusing Artificial Intelligence for Knowledge Retention and Transfer in the Fifth Industrial Revolution in South Africa: Establishment of a Knowledge Portal

Mashilo Modiba^{1*}

¹University of South Africa, Pretoria, South Africa.

*Corresponding Author: Mashilo Modiba (modibmt@unisa.ac.za)

Abstract

Artificial intelligence (AI) can serve as a solution for knowledge retention and transfer in the Fifth Industrial Revolution (5IR) in South Africa. AI involves the use of intelligent machinery embedded with AI algorithms to ensure the effective retention and transfer of knowledge in the 5IR. A significant challenge organisations face is retaining their existing knowledge and efficiently transferring it among staff members. The purpose of this study was to investigate the application of AI for knowledge retention and transfer in the 5IR, with the aim of establishing a knowledge portal. This qualitative study employed a literature review methodology and incorporated insights from researchers' experiences with using AI for knowledge retention and transfer in the 5IR. The findings suggest that AI can facilitate effective knowledge retention and transfer through the creation and use of an AI-powered knowledge portal in the 5IR. The AI knowledge portal can be integrated with knowledge management systems to safeguard organisational knowledge. Additionally, it allows for anytime access to this knowledge, regardless of location. The portal also connects users with knowledge resources and experts within the organisation, ensuring the accurate sharing

and exchange of knowledge. The study proposes a framework to incorporate AI in the establishment of an AI-powered knowledge portal, thereby enhancing the retention and transfer of knowledge in the 5IR.

Keywords: Artificial Intelligence, Artificial Intelligence-Powered Knowledge Portal, Fifth Industrial Revolution, Knowledge Retention, Knowledge Transfer.

Introduction and Background

AI can be utilised as a panacea for knowledge retention and transfer in the 5IR in South Africa. The 5IR refers to the collaboration of AI and human intelligence (HI) in ensuring that knowledge is retained and transferred in various organisations (Mkhize, 2026; Ziatdinov et al., 2024). This refers to the use of AI knowledge portals and AI chatbots that can collaborate with humans to retain and transfer knowledge effortlessly unlike in 4IR where AI can operate independently without any human intervention. AI refers to the use of intelligent machines embedded with AI algorithms, such as machine learning, deep learning, natural language processing (NLP), and black box to ensure that knowledge is retained and transferred in the 5IR (Jarrahi et al., 2023). A knowledge portal refers to an Internet-based computer program and software that institutes a single point of access to organisational knowledge, connecting knowledge repositories, expert directories, collaboration tools, and other knowledge-intensive applications within the organisation (Luna-Reyes, 2009; Nikeyi and Waveren, 2025).

Knowledge retention and transfer are progressively recognised as vital processes within organisations, especially as workforces become more dynamic and internationalised. As employees retire, change roles, or move to other organisations, the loss of their valuable knowledge can pose a serious risk to organisational continuity and efficiency (Tauro, 2021). Legacy methods and systems of retaining and transferring knowledge, such as documentation and in-person training, often fall short, particularly when dealing with tacit knowledge and the skills and acumen accumulated through years of experience in specific organisations. In reply to these challenges, AI offers immersive methods and strategies to capture, retain, and dispense knowledge effectively across an organisation, preserving crucial expertise even as the workforce advances (Zaoui Seghroucheni et al., 2025).

AI plays an essential role in recognising, classifying, and preserving knowledge in ways that range beyond human capability. Through AI tools such as machine learning and NLP, AI systems can evaluate massive datasets, harvest patterns, and build connections between fragments of information that may not be immediately obvious to human users (Chen et al., 2024). This analytical capability enables AI to capture both explicit (documented knowledge in an organisation) and tacit knowledge (knowledge possessed by individuals in an organisation), assisting organisations to retain valued insights that might otherwise be lost if not harvested intelligently. AI-based knowledge portals can incessantly learn from new information, adapting and evolving to provide updated knowledge, thereby ensuring that organisations have access to existing and pertinent expertise (Jarrahi et al., 2023).

Moreover, AI improves knowledge transfer by permitting knowledge personalisation and on-demand access. An intelligent knowledge portal, integrated with chatbots and virtual assistants, can deliver real-time responses to employees' questions, extracting what they need from vast databases of accumulated information (Jarrahi et al., 2023). AI can also tailor the delivery of information based on a user's role, preferences, and prior queries, making knowledge transfer more efficient and relevant. This personalisation lessens the time employees spend searching for information and permits them to concentrate on applying their skills to critical tasks, thereby improving productivity and facilitating smoother onboarding processes for new hires (Sajja et al., 2024).

AI-driven knowledge retention and transfer also subsidise nurturing a culture of constant learning within organisations. As AI-aided knowledge portals can capture insights and experiences from all levels of an organisation, they create a rich repository of knowledge that can be used for training, mentoring, and skills development (Sajja et al., 2024). These systems permit employees to benefit from the collective intelligence of the organisation, bridging knowledge gaps, and promoting a collaborative learning environment. By ensuring that knowledge is effectively retained and easily accessible, AI empowers organisations to adapt to change, innovate continuously, and maintain a competitive edge in today's knowledge-driven economy (Chen et al., 2024). Therefore, this study investigates the application of AI for knowledge retention and transfer in the 5IR with the aim of recommending a framework to develop an AI-aided knowledge portal for the retention and transfer of knowledge.

Conceptual Framework

A conceptual framework often contains a graphic display of concepts, which is useful in formulating a problem statement for a new study (Ngulube, 2022). The primary purpose of a conceptual framework is to guide a researcher's thinking when the collected primary data are analysed and interpreted. This study on the application of AI for knowledge transfer and retention was based on the Digital Transformation Model (skills and infrastructure) and the KM cycle (retention and transfer). The researcher intended to review the infrastructure and skills of the KM practitioners in using AI for effective and efficient knowledge retention and transfer.

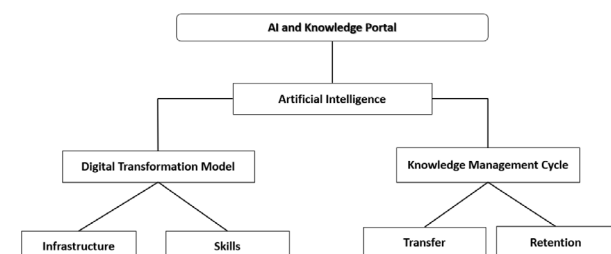


Figure 1: Conceptual Framework (Researcher, 2026).

Artificial Intelligence

AI refers to the use of intelligent algorithms to manage organisational knowledge and ensure that knowledge is retained and transferred effectively in

various organisations. An AI-aided knowledge portal can be used to harvest knowledge from practitioners through workshops and training, and by engaging staff daily in their professional activities (Nalubega and Uwizeyimana, 2024).

Digital Transformation Cycle

The digital transformation cycle was developed by Verina and Titko in 2019 to articulate on factors that organisations can explore when the need arises to transform their organisations digitally (Verina and Titko, 2019). Therefore, in this study, the concepts of infrastructure and skills were of paramount importance. Infrastructure refers to the tools that are required to use AI for knowledge transfer and retention in organisations. Skills refer to the proficiencies of KM practitioners to use AI tools effectively to manage knowledge, and to retain and transfer knowledge across organisations (Sajja et al., 2024).

Knowledge Management Model

The KM Model is focused on various factors that contribute to the effective management of knowledge in various organisations, namely, to create, store and share knowledge (Ortegon et al., 2016). Sharing knowledge refers to the knowledge that is retained in an organisation and transferred to members of the organisation through various AI tools such as an AI-aided knowledge portal (Chen et al., 2024).

Problem Statement

The problem that led to this study is that many organisations in South Africa, especially government departments, face momentous challenges in retaining their current knowledge and effectively transferring it among staff members. This issue arises mainly due to the lack of proper systems and channels designed to enable knowledge retention and transfer (Phaladi and Ngulube, 2022). Consequently, government entities lose the opportunity to preserve and leverage valuable knowledge that could enhance organisational performance and enable informed decision-making. One critical factor contributing to this problem is the lack of mentorship and training within government departments. Experienced staff members often do not mentor junior staff, provide training, or allow others to shadow them as they perform their duties. This results in a knowledge gap that makes it increasingly difficult for organisations to maintain and transfer institutional knowledge, especially when

experienced employees retire or leave the organisation (Ncoyini and Cilliers, 2020).

To address this issue, the integration of AI tools demonstrates a capable solution. Embedding AI algorithms into the computers of government employees could enable the automated harvesting of knowledge as staff members perform their daily tasks. These tools could then deposit the harvested knowledge into an AI-aided knowledge portal or repository. Such a portal would serve as a centralised knowledge bank, accessible to all employees via AI-driven chatbots. These chatbots would permit staff to retrieve and utilise the stored knowledge efficiently, ensuring continuity and informed decision-making within the organisation (Nalubega and Uwizeyimana, 2024). The application of AI in this context could revolutionise knowledge management (KM) in South African government departments. By enabling seamless knowledge retention and transfer, AI tools could assist in bridging existing gaps, improving organisational performance, and preparing government entities for the challenges of the 5IR. Therefore, this study was aimed at investigating the potential application of AI for knowledge retention and transfer in the 5IR in South Africa.

Purpose of the Study

The purpose of the study was to investigate the infusion of AI for knowledge retention and transfer in the 5IR in South Africa.

Objectives of the Study

The following objectives drove the study:

- To assess the role of AI in knowledge retention and transfer in the 5IR in South Africa.
- To identify the technological tools required to infuse AI for knowledge retention and transfer in the 5IR in South Africa.
- To evaluate the skills required to infuse AI for knowledge retention and transfer in the 5IR in South Africa.
- To propose a framework to develop AI-aided knowledge portals for the retention and transfer of knowledge in the 5IR in South Africa.

Literature Review

The literature review is based on the following: the role of AI in knowledge retention and transfer, the technological tools required to use AI for knowledge

retention and transfer, and the skills required to use AI for knowledge retention and transfer.

Role of Artificial Intelligence in Knowledge Retention and Transfer

The infusion of AI in knowledge retention and transfer, if used accurately, can bear fruit in ensuring that organisations effortlessly retain and transfer their valuable knowledge.

Artificial Intelligence for Knowledge Retention

Knowledge retention using AI involves using AI technologies to capture, store, manage, and retrieve knowledge within organisations. AI enhances knowledge retention by automating the collection and organisation of data, ensuring that valuable information is not lost due to employee turnover or inefficiencies in manual processes (Tyukin et al., 2018). AI systems can inevitably capture knowledge from several sources, including documents, emails, and digital communications, utilising NLP and machine learning. Such assistance preserves both explicit (documented information) and tacit knowledge (skills, experience) that might otherwise be undocumented. AI-powered knowledge portals can arrange information into structured formats, ensuring that they are easier to search and access. AI algorithms can routinely tag, categorise, and suggest pertinent information based on user queries, refining knowledge discoverability (Kaczorowska-Spychalska et al., 2024).

AI can assist in building knowledge maps within organisations by recognising key knowledge holders and mapping the relationships between several knowledge areas. Recommendation engines can proactively suggest resources or experts based on user behaviour, confirming that employees have access to the knowledge they need when they need it. AI can analyse data to predict probable knowledge gaps or areas where critical knowledge might be at risk of being lost (for example, owing to retirement or employee turnover). Organisations can then take proactive steps to document or transfer this knowledge to other employees or systems (Tyukin et al., 2018).

AI-powered chatbots and virtual assistants can deliver real-time access to knowledge portals, answering questions, offering training, or guiding users through complex processes. These tools improve knowledge retention by ensuring that employees can easily access and apply the knowledge stored in organisational

systems. AI can personalise training programmes based on employees' learning needs, helping individuals retain knowledge more effectively (Mkhize, 2026). Adaptive learning systems, which adjust content delivery based on users' learning pace, and AI-driven assessments can ensure that critical knowledge is ingrained and applied effectively. AI-driven archival systems can manage the storage, retrieval, and preservation of historical knowledge. By using AI, organisations can ensure that valuable documents and records are stored efficiently, are protected from obsolescence, and are accessible even after many years (Kaczorowska-Spychalska et al., 2024).

Artificial Intelligence For Knowledge Transfer

Automated knowledge capture and management refer to the process of utilising AI technologies to gather, process, and organise knowledge across an organisation scientifically without the need for manual input. This approach captures explicit and, to some extent, tacit knowledge by automating data collection, extraction, organisation, and categorisation (Tyukin et al., 2018). Automated classification algorithms can classify, tag, and sort large amounts of data, making it easier to retrieve and share relevant information. Optical Character Recognition (OCR) technology can digitise printed documents, making archived information more accessible for future use and knowledge transfer (Tan et al., 2024).

Intelligent knowledge retrieval is the process of using AI technologies to enable quick and accurate access to pertinent information within an organisation's knowledge portal. This process uses AI techniques to comprehend, interpret, and respond to user queries in a way that goes beyond simple keyword searches, providing contextually accurate, personalised, and efficiently organised results. Chatbots and virtual assistants can give immediate answers to employees' questions by retrieving pertinent information from a knowledge base, speeding up the learning process and improving productivity. Semantic search permits users to search for information using NLP, enabling faster and more accurate retrieval of complex information without requiring employees to know specific keywords. Recommendation engines analyse user behaviour and suggest relevant knowledge resources, documents, or courses, guiding employees towards the information most applicable to their tasks (Zaoui Seghroucheni et al., 2025).

Enhanced training and learning platforms are

AI-driven systems designed to facilitate personalised, efficient, and scalable learning experiences within an organisation. These platforms utilise AI to analyse user data, adapt content to individual learning styles and knowledge levels, and optimise the delivery of training materials for improved knowledge retention and skill development. Adaptive learning systems personalise training content for each employee based on their skill level, learning history, and role requirements, ensuring effective knowledge transfer tailored to individual needs (Tan et al., 2024). Virtual Reality (VR) and Augmented Reality (AR), powered by AI, enable immersive training experiences for complex tasks, allowing employees to gain hands-on experience in a simulated environment. AI-based content creation tools can generate automated summaries, infographics, and multimedia materials, making complex knowledge more digestible and engaging. Knowledge mapping and expertise location refers to the systematic identification, organisation, and visualisation of knowledge within an organisation, as well as the efficient identification of individuals or resources that possess specific expertise. This concept influences AI technologies to create a structured framework that connects relevant knowledge and expertise, facilitating effective knowledge transfer among employees (Jarrahi et al., 2023).

AI-powered knowledge maps create visual representations of organisational knowledge, linking related topics, documents, and expert contacts to make information navigation easier. Expertise location systems use AI to identify individuals with specialised knowledge or skills within an organisation, making it simpler to connect employees with the right expertise when needed. Facilitating knowledge sharing and collaboration refers to the implementation of AI-driven tools and systems that promote the exchange of information and foster collaborative efforts among individuals and teams within an organisation. This concept emphasises creating an environment where knowledge flows freely, using AI technologies to enhance communication, streamline workflows, and connect people with relevant insights and expertise (Taherdoost and Madanchian, 2023).

Collaborative AI platforms can analyse employee contributions across projects and suggest relevant experts, fostering a culture of knowledge sharing and cross-functional collaboration. Automated knowledge transfer workflows enable seamless sharing between employees, creating standardised processes

for mentoring, project handovers, and succession planning. Monitoring and evaluating knowledge transfer refers to the systematic assessment of how effectively knowledge is shared, understood, and applied within an organisation, using AI-driven tools and methodologies (Zaoui Seghroucheni et al., 2025). This concept involves tracking the processes of knowledge transfer, analysing outcomes, and measuring the impact of knowledge-sharing initiatives, ensuring continuous improvement and alignment with organisational goals. AI analytics track knowledge-sharing patterns and usage trends, helping organisations evaluate the effectiveness of knowledge transfer programmes and identify gaps. Sentiment analysis can assess how employees engage with knowledge resources, providing insights into areas where employees might need additional support or resources (Kaczorowska-Spychalska et al., 2024).

Technological Tools Required to Infuse Artificial Intelligence For Knowledge Retention and Transfer

Using AI for knowledge retention and transfer requires a range of technological tools that facilitate the creation, storage, and dissemination of knowledge. A knowledge management system (KMS) is a technology platform that enables organisations to capture, organise, store, and share knowledge efficiently (Tyukin et al., 2018). When augmented with AI, a KMS becomes a powerful tool for knowledge retention and transfer by automating processes, personalising content delivery, and improving accessibility to information. An AI-aided KMS ensures that knowledge is not only stored, but is also accessible, understandable, and actionable. This empowers organisations to foster innovation, improve decision-making, and enhance operational efficiency. It plays a crucial role in retaining institutional knowledge and transferring it effectively across teams and generations (Zamiri and Esmaeili, 2024).

An AI-powered Learning Management System (LMS) is a digital platform that uses AI to enhance the delivery, management, and assessment of learning and training programmes. By personalising content, automating processes, and providing actionable insights, an AI-powered LMS plays a vital role in knowledge retention and transfer (Olan et al., 2022). An AI-aided LMS not only facilitates learning, but also ensures the retention and effective transfer of knowledge across individuals and teams. It enables constant

skill development, supports organisational goals, and fosters a culture of lifelong learning in an increasingly knowledge-driven economy (Hall and Goody, 2007).

NLP tools are AI-driven technologies that enable machines to understand, interpret, and respond to human language. NLP tools play a vital role in processing large volumes of unstructured textual data, making it easier to extract, organise, and disseminate knowledge effectively in an organisation (Liebowitz, 2001). NLP tools bridge the gap between unstructured human language and structured machine processing, making them crucial for capturing, organising, and transferring knowledge. They empower organisations to unlock the full potential of their information assets, ensuring that knowledge is both preserved and readily accessible when needed (Yang, 2024).

Chatbots and virtual assistants are AI-powered tools designed to simulate human-like conversations and help users access, manage, and transfer knowledge efficiently and effectively. They play a crucial role in knowledge retention and transfer by providing prompt, context-aware responses; guiding users to the right resources; and supporting training or information dissemination efforts (Manesh et al., 2020). Chatbots and virtual assistants democratise access to knowledge, making it readily available and accessible to users regardless of time, location or expertise. By automating responses, facilitating learning, and guiding users through processes, they serve as vital tools for retaining organisational knowledge and enabling seamless knowledge transfer across teams (Adam et al., 2021).

Content creation tools are AI-powered software solutions that assist in generating, organising, and refining knowledge materials such as documents, presentations, videos, and interactive content. These tools modernise the process of developing educational and informational resources, playing a crucial role in knowledge retention and transfer by ensuring that information is captured, presented effectively, and made accessible to users and stakeholders (Olan et al., 2022). AI-powered content creation tools empower organisations to document, share, and disseminate knowledge efficiently. By automating and enhancing the creation of high-quality, engaging, and personalised materials, these tools ensure that knowledge is retained effectively and transferred seamlessly across individuals, teams, and generations (Jarrahi et al., 2023).

Data analytics platforms are AI-powered tools

that process, analyse, and visualise large datasets to uncover insights and patterns. These platforms enable organisations to derive actionable knowledge from data, identify trends, and support informed decision-making (Jarrahi et al., 2023). They play a vital role in capturing, preserving, and disseminating valuable organisational knowledge. AI-powered data analytics platforms enable organisations to transform raw data into valuable knowledge. By facilitating the retention of insights, identifying trends, and automating reporting, these platforms enhance the ability to transfer knowledge efficiently across teams and stakeholders, driving innovation and informed decision-making (Adam et al., 2021; Nikeyi and Waveren, 2025).

Cloud storage and collaboration tools are AI-powered platforms that enable organisations to store, manage, and share information across distributed teams securely. These tools facilitate knowledge retention and transfer by providing centralised access to information, real-time collaboration features, and intelligent insights to optimise knowledge workflows (Liebowitz, 2001). Cloud storage and collaboration tools are important for modern organisations aiming to retain and transfer knowledge effectively. By providing secure, accessible, and AI-enhanced platforms for storing and sharing information, these tools empower teams to work smarter, foster innovation, and maintain continuity of organisational knowledge across time and locations (Zaoui Seghroucheni et al., 2025).

Security and privacy tools are AI-driven technologies designed to protect sensitive and confidential information, ensure data compliance, and safeguard knowledge repositories from unauthorised access or breaches (Modiba and Shekgola, 2025). These tools play a vital role in knowledge retention and transfer by maintaining the confidentiality, integrity, and availability of organisational knowledge assets (Jarrahi et al., 2023). In an era where knowledge is a significant organisational asset, security and privacy tools are essential. By safeguarding sensitive information, ensuring compliance, and mitigating risks, these tools enable organisations to retain and transfer knowledge securely and effectively, fostering innovation and continuity in a safe environment (Hall and Goody, 2007).

Skills Required to Infuse Artificial Intelligence for Knowledge Retention and Transfer

Manesh et al. (2020) argue that using AI for knowledge retention requires a combination of technical, analytical, and interpersonal skills.

Data analysis skills refer to the competencies necessary to collect, process, and interpret data systematically to derive meaningful insights that can enhance KM practices. These skills are crucial for using AI technologies effectively to ensure that organisational knowledge is not only retained but also utilised to inform decision-making and drive constant improvement. The ability to analyse data sets to derive insights and inform decision-making, and skills in interpreting data trends and patterns related to knowledge retention and usage is part of the skill set needed to use AI to retain and transfer knowledge in innovative ways (Zamiri and Esmaeili, 2024).

Manesh et al. (2020) state that technical proficiency refers to the skill set and expertise essential to utilise and apply AI technologies, tools, and methodologies effectively in the KM process. This skill incorporates a range of technical aptitudes that permit individuals and teams to harness AI's competencies to capture, store, analyse, and disseminate knowledge within an organisation (Manesh et al., 2020).

According to Tauro (2021), comprehending AI principles, machine learning algorithms, and how they can be applied to KM, proficiency in programming languages (for example, Python, R) generally utilised in AI and data analysis and experience using AI-based tools and platforms for KM, such as NLP systems, AI chatbots, or knowledge repositories, are critical skills required in organisations (Adam et al., 2021).

In the view of Chen et al. (2024), KM expertise refers to the specialised knowledge and skills necessary to manage, organise, and utilise knowledge effectively within an organisation. This expertise incorporates a deep comprehension of KM principles, strategies, and best practices, as well as the capability to infuse AI technologies to enhance knowledge retention processes. Skills in identifying and structuring knowledge within an organisation for easier access and retention, as well as understanding how to create, curate, and manage content in KMSs, are paramount in the organisation (Adam et al., 2021).

Project management skills refer to the capabilities necessary to plan, execute, monitor, and complete projects effectively that implement AI technologies in KM initiatives (Amoah and Marimon, 2021). These skills incorporate an amalgamation of technical, organisational, and interpersonal abilities that facilitate the efficacious incorporation of AI into knowledge retention processes within an organisation. The ability to plan and execute AI-driven knowledge

retention projects, as well as ensuring alignment with organisational goals and skills in managing resources effectively, including personnel, technology and budget, are vital skills (Zaoui Seghroucheni et al., 2025).

According to Jarrahi et al. (2023), change management skills refer to the abilities essential to manage and facilitate the transition to AI-driven KM processes within an organisation effectively. These skills include comprehending the human, organisational, and technological aspects of change, enabling leaders and project managers to guide employees through the adjustments essential to the adoption of new AI technologies and practices. This refers to the capacity to adapt to new technologies and processes as AI tools and methodologies advance, as well as skills in designing and delivering training programmes to assist employees in effectively using AI tools for knowledge retention and transfer (Taherdoost and Madanchian, 2023).

Communication skills refer to the capabilities necessary to convey information, facilitate dialogue, and foster comprehension effectively among several stakeholders involved in the application and use of AI technologies in KM. These skills are vital for ensuring that all parties understand the purpose, benefits, and implications of AI applications for knowledge retention and transfer, as well as endorsing partnership and engagement throughout the process. This refers to the capability to convey complex AI concepts and knowledge retention and transfer strategies, particularly to diverse stakeholders. The skills in facilitating collaboration among teams to promote knowledge sharing and retention are of paramount importance in an organisation (Jarrahi et al., 2023).

According to Walter (2024), critical thinking and problem-solving refer to the cognitive skills essential to analyse information, evaluate its relevance and credibility, and develop effective solutions to challenges related to the incorporation and use of AI technologies in KM practices. These skills enable individuals and teams to navigate complexities, make informed decisions, and enhance the effectiveness of knowledge retention and transfer strategies (Walter, 2024). The skills in assessing challenges related to knowledge retention, transfer and devising AI-driven solutions, and the capability to think creatively about how to use AI technologies to improve knowledge retention and transfer practices are essential to and required in organisations (Yang, 2024).

Ethical awareness refers to the comprehension and recognition of ethical principles and considerations that arise when applying and utilising AI technologies in KM practices. This concept emphasises the significance of acting responsibly, transparently, and fairly in the development, deployment, and use of AI systems, especially concerning data privacy, bias, accountability, and the implications for individuals and organisations. Awareness of the ethical considerations surrounding the application and use of AI in KM, including data privacy, bias, and fairness, is of paramount importance for organisations adopting AI in KM.

User experience (UX) design refers to the process of creating user-centred interfaces and interactions that improve the effectiveness and satisfaction of individuals engaging with AI systems designed for managing, transferring and retaining knowledge. The concept of UX design emphasises the significance of comprehending user needs, behaviours, and preferences to develop intuitive and effective AI tools that facilitate the retention, transfer and retrieval of information. The skills necessary for designing user-friendly interfaces and experiences for KMSs that integrate AI features and that ensure high adoption rates are very important in an organisation (Hall and Goody, 2007).

Research Methodology

This qualitative study employed content analysis as its research methodology, informed by a literature review that incorporated the researcher's experience in applying AI for knowledge retention and transfer in the 5IR. The literature review was guided by thematic considerations and keywords, including "artificial intelligence", "knowledge retention", "knowledge transfer", "knowledge portal", and "Fifth Industrial Revolution."

Various search engines, such as Google Scholar, ResearchGate, Web of Science, EBSCOhost, ScienceDirect, Springer, and Sage, were selected for their ability to access a wide range of scholarly information. A systematic search was conducted using specific keywords, yielding a comprehensive corpus of relevant literature. The researcher meticulously sifted through search results to identify and retrieve sources pertinent to the study. Documents were rigorously screened and selected based on their relevance and applicability to the research inquiry.

The initial screening involved examining titles and abstracts to eliminate redundant or irrelevant sources. Full-text articles meeting the inclusion criteria were then evaluated further. Thematic analysis, following Braun and Clarke's (2006) methodological framework, was employed to examine, synthesise, and interpret qualitative data from prior studies systematically. This process included categorising findings based on the research objectives related to the focal subject matter.

Data extracted from the selected articles were synthesised and presented to provide a contextualised and coherent understanding of the research issues. The findings were organised into thematic categories, namely "artificial intelligence", "knowledge retention", "knowledge transfer", "knowledge portal", and "Fifth Industrial Revolution." These thematic insights offer valuable perspectives on integrating AI for knowledge retention and transfer within the 5IR.

Inclusion and Exclusion Criteria

This study conducted a systematic literature search to collect pertinent findings on infusing AI for knowledge retention and transfer in the 5IR. The researchers used specific search terms, including "artificial intelligence", "knowledge retention", "knowledge transfer", "knowledge portal", and "Fifth Industrial Revolution". The inclusion criteria for the study were as follows:

- Articles published between 2006 and 2026
- Empirical studies
- Articles written in English
- Publications in peer-reviewed scholarly journals

The exclusion criteria for the study were as follows:

- Articles that were not written in English
- Articles that did not focus on infusing AI for knowledge retention and transfer in the 5IR
- Research that consisted of grey literature or non-peer reviewed publications

To identify relevant scholarly works, the researchers initially screened abstracts to assess their alignment with the objectives of the study. The search criteria were later refined to focus on subject areas specifically related to infusing AI for knowledge retention and transfer in the 5IR, as these domains

form the foundation of the study. The literature search was limited to English-language articles published between 2006 and 2026.

The following academic databases were used for the literature search:

- Google Scholar
- Web of Science
- EBSCOhost
- ScienceDirect
- Springer
- SAGE

The researcher in this study applied the narrative review scientific method, which is a sort of literature review rigour that delivers a critical and descriptive summary of prevailing studies on a certain subject. It clarifies and produces preceding research in a legible and coherent narrative form without following the strict procedures used in systematic review (Sukhera, 2022). This method allows the researcher to use cite source from 2006 to 2026 without being on the databases from which the sources come.

Findings of the Study

The study findings were based on the infusion of AI for knowledge retention and transfer in the 5IR. AI can play a major role in the retention and transfer of knowledge in organisations in the 5IR. AI tools such as automated classification and machine learning algorithms can be used to classify, tag, and sort large volumes of information, facilitating the transfer and retention of knowledge in the 5IR. However, programmers must ensure that such AI tools are well programmed to serve the purpose they are programmed for. If AI tools are not well programmed, they can hallucinate and tempt with the quality of services in knowledge management. Through AI, searching and retrieving information from an organisational knowledge portal becomes more efficient. These portals can process users' queries, promptly respond to them, and deliver the required knowledge (Tyukin et al., 2018). However, proper skills are needed for the practitioners to be able to search and retrieve knowledge adequately. If practitioners are not well-trained, they might struggle to retrieve the most accurate knowledge from the knowledge hubs.

Additionally, AI-embedded knowledge portals can connect new employees with experienced staff,

enabling knowledge sharing that drives organisational progress. Recommendation engines can suggest relevant resources and experts based on user behaviour, further enhancing knowledge exchange. This will help the organisation to map knowledge experts and systems, especially new members in the organisation. They cannot struggle to get knowledge that can advance them beyond delivering on their functions. AI-enabled knowledge portals can also provide personalised recommendations for users by analysing behaviour and suggesting relevant knowledge resources and documents (Zaoui Seghroucheni et al., 2025). When practitioners use the AI portal to search and retrieve knowledge, it becomes easy for the portal to provide them with tailored knowledge based on their preferences and search history. It is therefore advisable for practitioners to engage these systems so that they can receive personalised recommendations.

Chatbots and virtual assistant tools embedded in these portals can retrieve knowledge resources promptly, regardless of time and location. Moreover, knowledge can be securely stored in AI-embedded cloud storage facilities, ensuring easy management and accessibility (Kaczorowska-Spychalska et al., 2024). Practitioners can also be able to work even when at home or anywhere in the world – this is the advantage of using AI-aided knowledge portals. Tools such as KMSs, LMSs, NLP technologies, AI chatbots and virtual assistants, content creation tools, data analytics platforms, cloud storage solutions, and security and privacy tools can seamlessly integrate AI to retain and transfer knowledge within organisations (Jarrahi et al., 2023). These tools ensure that users can effortlessly access and retrieve knowledge resources and documents anytime, anywhere. Security and privacy tools are particularly essential, protecting organisational knowledge resources and documents from unauthorised access and cyber threats (Modiba and Shekgola, 2025; Olan et al., 2022). It is significant to secure the AI-aided portal with AI security features to ensure that hackers do not have access to the portal. Access to the portal will be given only to relevant people within the organisations.

For AI to be applied effectively in knowledge retention and transfer in the 5IR, specific skills are crucial. These include data analysis, technical proficiency, AI expertise, project and change management, communication, critical thinking, problem-solving, and ethical awareness (Walter, 2024).

UX skills are particularly important to ensure that knowledge portals are user-friendly and accessible to diverse users. By combining advanced tools and essential skills, organisations can effectively retain and transfer knowledge through AI-embedded knowledge portals in the 5IR.

Recommendations

This section proposes a framework for utilising AI to improve knowledge retention and transfer in

the 5IR. AI-driven solutions, such as intelligent knowledge portals, possess the capability to facilitate the seamless transfer and retention of knowledge. These portals enable users to access and retrieve knowledge resources and documents within an organisation promptly, as depicted in Figure 2. The proposed framework demonstrates how an AI knowledge portal can effectively support the retention and transfer of organisational knowledge, serving as a pivotal tool in the 5IR.

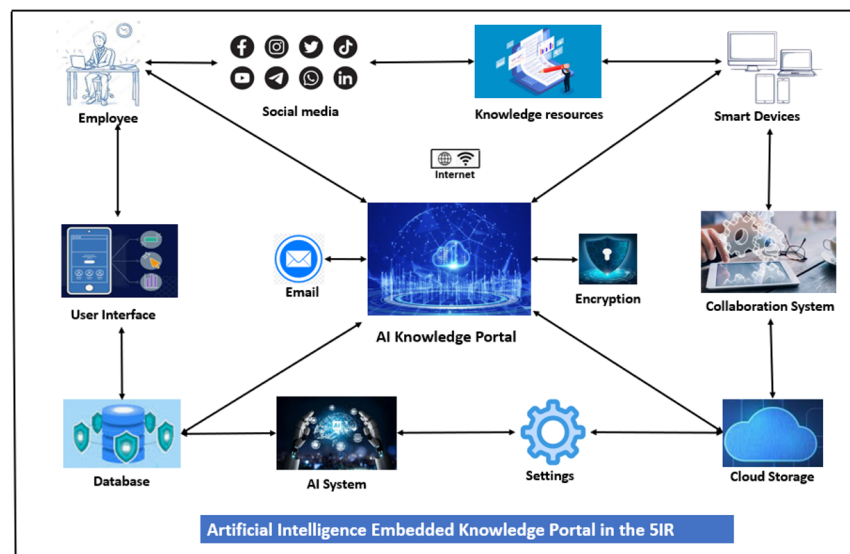


Figure 2: Framework to Use an Artificial Intelligence Knowledge Portal for Knowledge Retention and Transfer

in the Fifth Industrial Revolution.

This framework illustrates how an AI knowledge portal can integrate with various systems such as AI systems, databases, cloud storage, collaborative systems, smart devices, social media platforms, and knowledge resources to enable effective and efficient knowledge access, retention, and transfer in organisations.

Cloud Storage

AI knowledge system has to be integrated with the cloud storage. When the AI knowledge portal is integrated with cloud storage facilities, managing organisational knowledge becomes more streamlined since knowledge can be stored securely in the cloud. This integration ensures that knowledge resources and documents are accessible from anywhere and at any time through Internet connectivity and smart computing

technology. However, such knowledge resources must be protected against unauthorised access.

Knowledge Resources and Security

Sensitive knowledge resources, including secret, top secret, and confidential documents, can be safeguarded through robust security measures such as encryption, password protection, security codes, fingerprint recognition, and facial recognition systems. This will ensure that the knowledge resources in organisations can be accessed by employees who are authorised to access them.

AI System

AI systems embedded in the knowledge portal will enhance the UX through smart search interfaces, enabling users to search for and retrieve knowledge resources and documents efficiently. This functionality

minimises search time and effort, ensuring quick and seamless access to the required information. This will ensure that the employees can easily access the knowledge assets in the organisational knowledge system.

Databases

Furthermore, integrating AI-powered databases into the portal allows users to perform intelligent searches and retrieve specific knowledge resources and documents with ease. These features empower employees to access intelligent KM databases and systems through advanced computer technology, fostering streamlined operations within the organisation.

Collaborative System

The collaborative systems embedded in the AI knowledge portal enable employees to work together more effectively, sharing insights and resources in real time. AI-integrated collaborative systems embedded in AI knowledge portals can assist employees to work on similar projects from different locations. Employees do not always have to travel between offices to work on collaborative projects, but they can use collaborative systems.

Social Media

Integration with corporate social media platforms allows organisations to harvest valuable knowledge from social interactions and user engagements. These platforms can also serve as channels for transferring knowledge among employees and stakeholders, ensuring widespread dissemination of organisational insights.

AI Knowledge Portal and Email System

Additionally, email systems integrated with the AI knowledge portal enable seamless sharing and transfer of knowledge resources, further enhancing communication and collaboration within the organisation. All emails that form part of the knowledge assets can be transferred to the knowledge portal to ensure that they are accessible when needed by other employees in the organisation.

User Interface and Settings

To maximise usability, the KM database

integrated into the AI knowledge portal must feature a user-friendly interface. This design ensures that users can easily navigate the system and retrieve the required knowledge resources and documents without difficulty. This will help the employees to easily retrieve knowledge without experiencing challenges with the portal. By addressing usability concerns and using advanced technologies, the AI knowledge portal becomes a powerful tool for knowledge retention and transfer. When implemented properly, an AI knowledge portal can serve as a cornerstone for organisational KM in the 5IR, driving innovation and efficiency across various domains. The AI knowledge portal can be programmed by ICT staff in the organisations. The ICT can also ensure that the troubleshoot all the glitches that the system experiences to ensure that the system operates effectively.

Conclusion

In conclusion, the implementation of an AI knowledge portal can play a pivotal role in facilitating knowledge retention and transfer in the 5IR. By establishing and utilising such a portal, organisations can effectively and efficiently manage their knowledge assets. This ensures that valuable insights, expertise, and information are preserved and readily accessible for future use. An AI knowledge portal not only streamlines the process of retaining and transferring knowledge, but also enhances collaboration, security, and accessibility across the organisation. Its integration with advanced technologies such as cloud storage, AI-driven search systems, and collaborative tools empowers employees to access and share knowledge seamlessly, driving innovation and operational excellence. Consequently, adopting an AI knowledge portal positions organisations to thrive in the dynamic landscape of the 5IR.

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Mashilo Modiba is a Professor at the University of South Africa (UNISA). He holds Bachelor of Information Studies, Bachelor of Library and Information Science, and Master of Information Studies degrees from the University of Limpopo, South Africa and a Doctor of Philosophy degree in Information Science from the University of South Africa (UNISA).