THE ROLE OF ARTIFICIAL INTELLIGENCE IN KNOWLEDGE MANAGEMENT THROUGH DIGITAL TRANSFORMATION: A SYSTEMATIC REVIEW

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Abstract
The aim of this research investigation is to provide a comprehensive evaluation with further objective to establish a cogent model of when and how artificial intelligence (AI) influence knowledge management (KM) directly and then the mediating influence of digital transformation (DT) in the work setting of organizations in Pakistan. There have been a rapid growth of AI in knowledge management while less development is noted in developing countries which are still downhearted due to the common reasons of financial issues, insufficient infrastructure, and technology and culture barriers. In order to address these gaps, the current study is initiated with the aim to develop a process model with the theory support of Dynamic Capabilities Theory. Based on the said theory, a theoretical framework was established where direct and indirect relationships of the study variables were formed. Building upon Dynamic Capabilities Theory, the paper expounds on how organizations can effectively sense opportunities with AI, seize them with the embedding of DT routines, and then reconfigure their knowledge to enhance the acquisition, sharing, and application of knowledge. The study aimed to determine the status of AI-enabled KM in terms of its recent implementation in Pakistan, explore inhibitors, examine the mediating role of DT, and to propose a national tailored framework for better KM outcomes. The literature review suggests that AI technologies, such as ML and NLP, can automate/improve knowledge processing, but that their value is realized only in connection with organization-level technology transformation, or digital

transformation. On the basis of this stream of literature, hypotheses were developed, examining the effect of AI on KM, the mediating role of DT and the moderating impact of governance and absorption capacity. The study has theoretical implications by contributing to KM and digital transformation literature through a mediation-based model and practical implications by providing implications for organization and policy makers under the "Digital Pakistan" prospectuses. The future directions highlight the empirical validation of the model by using quantitative techniques, developing domain-specific measurement scales with new items for AI, DT, and KM, and sectorial or longitudinal studies to capture differences across time. The following contributions assist to enhance academic as well as practical preparedness for AI-powered KM in Pakistan.

Keywords: Artificial Intelligence, Knowledge Management, Digital Transformation, Dynamic Capabilities Theory, Mediation Model, Organizational Learning, Pakistan, Innovation

Background Information

The application of artificial intelligence (AI) to knowledge management (KM) represents the emergence of a new approach to the manner in which organizations seek meaningful information to capture, store, process and share knowledge in the age of digitalization. Knowledge Management (KM) as a process of organizing, sharing, and manipulating an organizations' knowledge and information is well accepted as an important factor influencing innovation, and organizational learning long before Nonaka and Takeuchi (1995).

In an age where AI-driven tech like Machine Learning, Expert Systems, Data Mining and Natural Language Processing are all powerful tools capable of identifying patterns in vast datasets AI will develop more with each passing day to be both cleverer, nimbler and more helpful than ever before for our decision-making and daily operating efficiency. With its ability to consume, analyze and detect patterns, activities and useful intelligence AI is becoming an essential component of today's KM practice–though not necessarily in the traditional sense. Never before have enterprises been able to tap into explicit and tacit knowledge like this (Liebowitz, 2019). This visionary intersection of concerns is paramount to the digital transformation phenomenon that today drives enterprises around the globe to find fresh ways increase business value with technology. However, AI in KM takes many forms depending on where you look at it geographically leading to 'adaptive pathways' and these final pills are on the verge of being taken up by developed and developing countries alike.

At the global level, the influence of AI on KM depends on a country's technological development and an organization's readiness. Cognitive computing automation, personalized knowledge delivery and predictive analytics are changing KM strategy with the drive to capture codified knowledge. For instance, AI-driven solutions such as chatbots and virtual assistants facilitate real-time knowledge sharing among employees, while intelligent search engines and recommender systems help users harvest valuable

information from often vast repositories."By using the NLP capabilities that AI has to offer, an organization is able to obtain insight from unstructured data sources like emails or social media and reports, 'translating' tacit knowledge into explicit information," according to Dr Li Hua from Tsinghua University's School of Economics and Management. AI-KM is firmly ensconced in enterprises around the world. Today it is a booming market; AI-KM predicts that by 2025 the global market will be US $31.2 billion and this will encompass all of enterprise applications for artificial intelligence systems where we find KM to be one part.

The reason for this is those companies are generating large quantities of data (which is often called "big data") and there is a demand from the market to develop effective systems to handle this data and capitalize on it. AI is not only a means of automation. It's also a new form for enterprises to learn what's really happening in their markets, what clients want and how resources are being wasted internally, before any such waste ever occurs. (Brynjolfsson & McAfee, 2017). However, the uptake and effects of such technologies varies geographically. Differences in infrastructure, digital skills and economic resources mean that developed and developing countries move at different speeds along the track.

In AI-KM fusion for many technologically advanced countries, it represents their large investment state-of-the art infrastructure and mature organizations. The United States, Germany, Japan and the United Kingdom are leading the way in deploying AI technology to encourage knowledge management in areas such as health care, finance, manufacturing and science. They also stand out in terms of experience including for example through its use of AI health systems. Watson is one such company that has developed an AI system specifically for healthcare, capable helping to extract knowledge and diagnose ancient in 1965 by treating performance statistics as actual data. In this system hundreds of thousands of pages of medical literature and patient records are analyzed simultaneously to provide suggestions with supporting evidence (Chen et al., 2016).

The same is true for financial service companies in the world's rich nations, where they rely on AI equipped KM systems to stop fraud, judge risk, and provide individual customer service by analyzing data logs with predictive analysis. The European Union also provides evidence at a mass level of its use of AI in KM, with projects being funded through initiatives like the EU's Horizon 2020 which incorporates AI into organizational learning and innovation ecosystems (European Commission, 2020).

They also benefit from their high digital infrastructure levels TB-d from main roads to telecommunication networks, over 3% of GDP devoted to R&D every year, and the ability to create and install AI products among the workforce. Furthermore, the legal framework in developed countries, e.g. General Data Protection Regulation (GDPR) in Europe sets the standard of a responsible AI use in KM solving issues of data privacy and algorithm bias (Voigt & Von dem Bussche, 2017).

Nevertheless even in these areas where recognition and support for startups abounds challenges also lie ahead: technical costs, traditional system reluctances, and then an over reliance perhaps on an AI system which will not always take into account human judgment one more time as needed. Under this kind of influence, different countries, at

least those in the developed world, are on the whole all able to exploit AI to some extent in regard of KM and are also often the ones determining global standards for best practice and innovation.

However, in developing countries the role of AI in KM is subject to particular opportunities and a specific sets of constraints that are oriented toward disparities in technological access, financial resources, and institutional capabilities. Many countries in Sub-Saharan Africa, South Asia, and some in Latin America have started to recognize the critical infrastructure for knowledge management challenge brought by AI in agriculture, education and public health.

In India, for instance, AI-based KM has been brought into service via tools such as Microsoft AI (Microsoft, 2019) for agriculture in order to serve the farmers. This way of working enables them to find out about real-time weather reports from weather websites, soil health for different crops, pesticide recommendations to use on pests attacking plants-or, market price trends so they can anticipate what will happen long before their fields are ready to. In this manner, their lives may truly change and for the better (Alan Turing Institute, 2022).

So far, developing-country KM with AI faces challenges from several structural obstacles. Among them are weak digital infrastructure like some places have little telephone service and still use carrier pigeons at times (Mohl, 1999) because their postal systems do not provide an international connection; in many African countries overall Internet penetration is still under 50% (International Telecommunication Union (ITU) 2022); lack of human resources to both operate and maintain AI systems.

Financial limitations are also a big factor given that many of these groups don't have the means to invest in AI technology or the infrastructure for data storage and processing needed to deliver it. Furthermore, data quality and availability remain a significant challenge as a vast majority of data in developing contexts is often unstructured or incomplete, thereby reducing the effectiveness of AI algorithms. Additionally, there are cultural and organizational barriers to technology uptake that act as barriers to AI adoption in KM activities, and the fact that many small and medium-sized companies (SME) continue to use manual techniques rather than looking towards digital solutions due to ignorance and or mistrust assuming that technology does not help or is not user-friendly (World Bank, 2020).

Many emerging markets are plugging into local capacity as never before, with backing from outfits such as Google or IBM that provide both AI institutes to train the hands and inexpensive, easy-entry tools for writers too. These are part of a movement called 'democratizing AI' which is about more than just one-way traffic in tech terms. Raising the proportion of effort that takes place on home soil and turning it into an enabling environment in which villagers can transcend themselves through their own expertise and technologies is amounts to a knowledge economy.

In the developed world, the focus of AI for KM is to refine techniques and thinking on ethical issues in developing countries. However, AI technology has only just started getting more attention (e.g., it may have been used by enterprises earlier than government rather than central party organizations).

It takes both sides to be successful at these challenges. For example, investment in digital infrastructure or even local AI solutions that fit the specific social and economic backgrounds needs of various regions is what it will take for everyone to win from China to Africa increasingly (United Nations, 2021). Furthermore, on the global level the KM community needs to keep in mind the ethical implications of discussing AI. This includes such areas as universal access and having humans in control, rather than machines or biased systems (which in turn would continue and extend old inequalities all over the world). With AI computers becoming even more powerful, integration of AI into KM may be further strengthened and expanded. New types of AI-powered technology will be used to create and transmit knowledge of different types in struggle (Brown et al., 2023).

In recent years there has been a major change in the global environment of knowledge management (KM), due to the pervasive application of digital technologies and artificial intelligence (AI). These are technologies that are changing the ways organizations can capture, process and utilize knowledge for competitive advantage in decision making, business operations and fostering innovation.

In the modern business world, digital transformation has completely changed knowledge management. Nowadays, companies use cutting-edge technologies to integrate in which processes, while at the same time aiming for better business results (Brynjolfsson, McAfee & 2025). It is now AI in particular in terms of machine learning, natural language processing and generative models that makes the automatic, efficient management of such knowledge resources possible. Prior studies reveals that data is becoming increasingly large in scale and complex in nature, traditional ways of managing and utilizing knowledge are gradually becoming inadequate (Chong et al., 2024).

The rise of AI techniques in KM systems means that organizations can now go beyond simple information storage and retrieval in such architectures to build highly interactive, adaptive knowledge landscapes which are capable of responding flexibly according to business requirements (Gartner, 2024). AI-started technologies such as chatbots, recommender systems and cognitive search will all sort large amounts of data: they are able to provide workers with personalized and relevant information whenever they need it.

Knowledge management with the support of AI and digital transformation promotes effective decision-making. This means that people are more open to ideas and innovation as well as work together across departmental lines (Lai et al. 2024). Kumar et al. (2025) estimated that by 40% coverage of grasses, AI tools have brought an end to the days when it would take forever and a day for people find their way through information. Over the years natural language processing has enabled AI to better understand data as found in e-mails, reports and academic papers. It can in future handle richer and more nuanced knowledge management problems.

AI also helps capture and retain tacit knowledge, which is a longstanding problem for KM systems. Tacit knowledge, which is generally possessed by the experienced workers or the experts of an organization, is hard to be codified and shared. And yet, by using AI-based technologies like intelligent agents and AI assistant tools,

organizations may now easily be able to codify implicit knowledge, such as profiles of past employees, who share their decision and behavior patterns either through natural dialogue or with data, and make this information explicit (Smith & Williams, 2025).

They preserve unspoken knowledge by transforming it to explicit forms that other members of the organization can use (and retain) so that it does not get lost when employees leave or retire (Davenport & Prusak, 2024).

Furthermore, AI applications are developing to enable to cope with the dynamism of knowledge, i.e., continuously update and validate knowledge, which improves the effectiveness of the KM process (Bharadwaj et al., 2025).

However, despite the many benefits, the integration of AI into KM also has its own set of challenges. All these must make MI difficult to implant in the KM system of an organization if its people are not ready for change. Also, the ethical problems caused by AI, such as privacy, data security, and the inequality of algorithms, must be properly governed to prevent potential second-order effects. (Jain et. al., 2024)

The research by Zhao et al. (2024) pointed out that to realize AI KM (or knowledge management) was not just a purely technical challenge but also involved leadership; it required fitting in with the organization and strategic orientation very much. This echo of the study conducted by Choi and Lee (2025) suggests that the effectiveness of an AI-based KM system is related to well-defined governance that takes into consideration aspects such as transparency, accountability, and data privacy.

On a broader global canvas AI-based KM systems have not only promoted efficiency inside organizations but more agile response to market conditions, technologies and regulations. Through its contribution to a learned and adaptive corporate culture, AI now is making companies capable of understanding 'business' in a digital world (Westerman & Bonnet, 2024). AI in KM as the pace of digital transformation quickens, AI's role in KM will no doubt expand further and bring about increasingly clever approaches to managing knowledge across a range of industries. The surveys found that the AI-KM combination would become the supporting platform for the future way of working and living, a subject apparently well worthy of future research and practice too (Klein&Zeng, 2025).

Problem Statement

In developed countries, embedding of artificial intelligence (AI) into knowledge management (KM) is quite mature on the foundation of the strong digital infrastructures coupled with heavy investments in R&D, and regulations that create an enabling environment for innovation and also cater to ethical considerations (Choi and Lee (2025). Among other examples, U.S., European, and Japanese firms have extensively employed AI techniques such as intelligent search engines and chatbots, recommendation systems and natural language processing (NLP) software to automate KM processes, improve organizational decision making and share knowledge across entities in industries such as healthcare, and manufacturing (Davenport & Ronanki, 2018; Liebowitz, 2019).

They help to create and maintain cultures of innovation and organizational learning as well as to be able to keep good track of knowledge, so other regions want to live up to

their example. The developed countries are seizing the lead to determine global standard of AI-driven KM despite their various obstacles including high cost involved for putting it into effect and resistance to accept it (Brynjolfsson & McAfee, 2017).

In developing countries, KM through AI is emerging but limited by infrastructural, economic and organizational barriers. Countries in South Asia, Sub-Saharan Africa, and to some extent Latin America have seen AI as a tool for enhancing knowledge production and utilization processes, including in key areas such as agriculture, education and health.

For example, India uses AI for its SmartAgri and Kenya for its AI-facilitated health education chatbots, illustrating the disruptive power of AI in low-resource environments (Wawira Gichoya et al., 2018; Microsoft, 2022). Weak digital infrastructure, lower data quality, relatively low AI literacy and inadequate financial resources stand in the way of broader deployment (International Telecommunication Union, 2021; World Bank, 2020).

Although global tech giants as well as international organizations have recently launched programs that support low-cost adoption of AI, the majority of the developing countries are in their early stages, where their roadmap is more about how to have access and how to afford it than it is about KM sophistication.

The use of AI in KM in Pakistan is still more embryonic, with isolated activities in various sectors of the economy and minimal scientific approach into its broader applicability to organizations. Research has shown that banks has started adopting AI in personalization, fraud detection, and process automation; but little research has explored the application of AI in KM practices other than financial sector (Journal of Business and Management Research, 2024).

Likewise, the library and information industry appears to be only partially prepared for AI adoption, due to reasons like lack of technological infrastructure, financial impediments, and shortage of trained personnel (Evidence Based Library and Information Practice, 2024). In the field of medicine, on the one hand studies have shown average knowledge and positive attitudes towards AI which, on the other hand, have not been put into daily work practice (Sadiq et al., 2024).

A national survey reinforces that though the prospects of AI are realized across healthcare professional in Pakistan; mainstreaming in KM and decision-making systems are still limited (Ali et al., 2024). At the same time, while several scholars have become interested in the application of AI in education, healthcare, or project management, to date, no single-point study has provided an overall examination of how AI can systematically contribute to KM through explicit and tacit knowledge capture, knowledge retrieval, and digital transformation in organizations.

The absence of such integrated frameworks and empirical evidence hints at a fundamental gap in Pakistan, one that needs investigating in terms of sectoral requirements, computational literacy issues, infrastructure pressures and organization culture if efficient AI support is to develop KM systems. To fill this gap is crucial if our overseas readers are to pick up technologies out of date relatively quickly as our corporate clients do now, and so importantly for a future global trend on AI based digital transformation in which Pakistan can participate.

Objectives of the study

To analyze the existing status of AI implementation in KVM practices of significant sectors in Pakistan in the light of potential benefit of digitalization.

To uncover the Infrastructure, Organizational, Cultural and Financial challenges that are impeding the incorporation of AI in knowledge management in the process of Digital Transformation in Pakistan.

To investigate how digital transformation mediates the relationship between AI deployment and the efficient transfer, storage and sharing of both explicit and tacit knowledge in Pakistani firms.

To measure AI-assisted knowledge management, via digital transformation on organizational learning, decision-making and innovation in Pakistan.

To produce a context-bound menu of options as policy recommendations for the Policy Makers, Organizational Presidents and Geeks who can adopt the new AI KM through transformation of digital structure in Pakistan.

Significance of the Study

This research is important for developing the theoretical framework as well as practical application of artificial intelligence (AI) for knowledge management (KM) in the context of digital transformation underway in Pakistan. AI is becoming more and more accepted worldwide as a facilitator to KM practices to better capture, process, and transfer knowledge as well as to enhance decision making and innovation within organizations (Davenport & Ronanki 2018; Liebowitz 2019).

Nonetheless, in developing economies like Pakistan, the nexus between AI and KM is less explored, and how digital transformation moderates the relationships remains under exposed. In addition, the paper contributes to filling the gap between global knowledge and local realities in the context of AI-driven KM by providing learnings of how knowledge sharing solutions can be deployed to address national priorities with respect to digitization.

Theoretically, it also contributes to the literature by positioning digital transformation as a mediator that links AI adoption with KM outcomes. Digital transformation has been highlighted as a process of reshaping organizational processes and unlocking value through the exploitation of digital technologies (Bharadwaj et al., 2023; Westerman & Bonnet, 2024).

However, little empirical evidence is available on its mediating role in the developing world. Empirically exploring this relationship, the research contributes to our understanding of how AI-enabled KM systems, integrated into broader digitalization initiatives, can strengthen organizational learning, competitiveness, and innovation. This is consistent with recent calls by scholars to situate AI research in the KM context by factoring in, socio-economic, cultural, and infrastructural considerations in emerging markets (Chong et al., 2024; Kumar et al., 2025).

From a practical lens, the study has enormous implications on policy makers, organizational leaders, and practitioners in Pakistan. As the country seeks to realize its "Digital Pakistan" vision, the recognition of the need to incorporate AI into the support

of KM through digital transformation is key to enhancing the performance of institutions and national competitiveness (Government of Pakistan, 2022).

The findings of this research will provide references for other entities and areas were considered as important speed knocks that prohibit enterprise bringing the decision-makers need most of all to recognize how such traps push them ever closer into inactivity. These people have the ability to build tailored AI-dependent KM frameworks in such fields as banking, healthcare, libraries and education that are designed both to keep explicit knowledge from disappearing forever but also to foster ongoing innovation.

The research aiming have two implications: One aspect is theoretical beyond itself, indicating with the mediating of digital transformation the direction AI-enabled KM is heading; another is how Pakistan can increase its capabilities to make digital innovation sustainable, in turn making it also a source of sustainable organizational development. The larger part of Pakistani people have now been registered by this man as an expense rather than an asset, something that should be liquidated as quickly as possible. They are accordingly a big problem for the Chinese Revolution: not only can they no longer feed themselves but there is also little to turn them into productive members of society.

Review of Literature

The combination of artificial intelligence and knowledge management organizations both find out, collect and keep hold information in AI does not show any resulting KM effects. There is far too little empirical research on this subject for it to be well understood. Current business environment show that AI is now the basis for real-time, dynamic. On-the-fly knowledge extraction by ML, NLP and retrieval-augmented generation (RAG). Whether these services will benefit people in general; however, depends upon good governance models data quality levels and readiness of organization (Gelashivili-Luik et al., 2025).

Importantly, emerging evidence indicates that Digital Transformation (DT) broadly defined as the integrated process of transforming processes, infrastructure and culture to an organizational level as facilitated by digital technologies functions as an enabler through which AI capabilities filter and affect KM effectiveness and the downstream performance (Ma et al., 2025; Vărzaru et al., 2024).

AI extends the KM value chain on three dimensions: knowledge discovery, knowledge organization, and knowledge use. In generative and predictive models, discovery enables us to more fully capture and codify any emerging knowledge that could not have been captured in our repositories in view of local, fragmented and unspoken signals and knowledge (Taherdoost, 2023). Knowledge graphs, vector indexes and cognitive search systems from organization increase bring more accurate retrieval and contextually surface knowledge where it's needed (Ontoforce, 2024; TechRadar Pro, 2025).

In application, decision support and agented workflows inscribe knowledge within operations, reducing search and coordination costs and allowing for anticipatory moves (Jarrahi et al., 2023). However, these technical affordances seldom generate value alone;

they depend on parallel changes in data infrastructure, roles, and governance, often coordinated as DT programs (MIT CISR, 2024; Deloitte, 2024).

Empirical research is also increasingly linking AI and KM enhancements to digitally transformed operating models. Within finance–innovation literature, Ma et al. (2025) have demonstrated that DT is significantly related innovation performance and AI is a core instrument in DT portfolios (Finance Research Letters). However, as they are primarily concerned with innovation and not how information is managed, they may provide only limited insights.

In digital organizations, by comparison, AI becomes a dream-like function of flows and first-level cognition shared by everyone and available to everything. Upgrades to the flow structure necessitate instantiation of new routines that better exploits AI: as used with devices for instance more content-based searching (Yin et al., 2025).

Studies on AI's effect on the Innovation Capability of Digital Organizations This study, based on previous works related to AI and the Innovation Capability of Digital Organizations, further explains the changes in processes, data governance and how companies integrate software basic layers. These are all levels typical under DT conditions (Fu et al., 2025).

The results of these frameworks can be transferred beyond this research. They also match with other evidence such as digital maturity and DT capabilities (e.g., cloud data platforms, API-first integration, data lifecycle management) are all contributions that successfully explain why different companies apply AI for knowledge work (Jie et al., 2025; MIT CISR 2024).

Consider cognitive search and RAG. Industry and investigation reports agree that RAG is only reliable in permission-aware answers when the organization enjoys good document/knowledge foundations, governed content lifecycles, access controls, metadata standards and unified indexes classic DT artifacts (TechRadar Pro, 2025; K2View, 2024; Glean, 2024).

New systematic and narrative reviews further build the evidence base but also expose methodological deficiencies. Taherdoost (2023) consolidates 10 years of AI–KM research revealing stable relationships between AI-occupied systems and KM performance (acquisition, storage, sharing, application). However, much of the included studies are cross-sectional, conceptual and context-bound making it difficult to interpret causality and to generalize.

Gelashvili-Luik et al. (2025) also pinpoint the need to rely less on case studies and conceptual pieces, and ask for designs that can measure cost benefit trade-offs, governance impacts, and integration frictions. The previous studies provide empirical evidence for AI and KM relations but do not explore the mediating effect of DT. Meanwhile, in domain-specific studies (e.g., supply chain, services), mediating roles of DT or associated constructs in converting digital technologies into performance are reported a sign that mediation is universal in digital capability chains even if not directly tested on KM outcomes (Mohaghegh et al., 2025; Vărzaru et al., 2024).

Collectively, the literature suggests an under-specified causal chain for instance AI capability is a necessary input but an infrequent precursor; DT capabilities seem to act

as the "activation energy" that can catalyze AI investments into systematizing KM benefits.

The dynamic capabilities and socio-technical perspectives offer theoretical groundwork for mediation model. From a knowledge-based theory perspective, transposition of AI capability for instance 'sensing through analytics; seizing via decision support; transforming through automation' by DT routines (modular architectures, data governance, agile process redesign) is required for reconfiguration of knowledge processes at scale.

Proposed hypotheses

H1: AI is positively related with KM effectiveness (knowledge acquisition, organization, sharing, and application).

H2: There is a positive relationship between AI capability and digital transformation maturity.

H3: KM effectiveness is positively related to digital transformation maturity.

H4: Digital transformation mediates the relationship between AI capability and KM effectiveness such that greater AI capability boosts DT maturity and ultimately KM.

Theory Support

Dynamic capability theory (DCT) is the most suitable and powerful theoretical base of the current study such as (AI capability → Digital Transformation (mediator) → Knowledge management effectiveness). DCT provides insight over how companies deliberately build, merge and arrange internal and external competences to confront the rapid changes of environments (Teece, 2007).

The kernel of DCT detecting opportunities, seizing them, reconfiguring resources fits the processes through which organizations apply AI, utilize digital transformation as a program of organization, and achieve better KM outcomes. AI is sensing and analytics capacities (the ability to sense and analyze the knowledge signals), digital transformation is the organizational routines and architectural realignments that capture and scale AI-enabled opportunities, and KM effectiveness is the result of the firm's adapted knowledge processes.

Since the study model clearly postulates a mechanism (DT) through which a technological capability (AI) creates organizational outcomes (KM), DCT offers consistent linkages between micro and macro levels and specific empirical constructs (capability levels, routines and reconfiguration outcomes) that are amenable to measurement and hypothesis testing (Teece, 2007; Vial, 2019).

Theory in Practice

AI Capability (Independent Variable) Dynamic capability theory DCT Construct Sensing & Seizing Capabilities in DCT sensing is the capability to recognize value-creating opportunities and associated new information, whereas seizing is the ability to mobilize resources to capture value-creating opportunities (Teece, 2007). AI capability is operationalized as machine learning models, NLP systems, RAG pipelines, MLOps maturity and analytics infrastructure is a firm's sensing/seizing bundle.

From a practice point of view, AI enhances the ability of an organization to sense weak signals existing in unstructured data (implicit knowledge signals), automate the codification, and make suggestions about what to act upon. According to DCT, a higher level of AI capability would depending on circumstances enhance the firm's capacity to sense opportunities for knowledge and to seize them through automated decision support (Ma et al., 2025; Gelashvili-Luik et al., 2025).

Digital Transformation (Mediator) and DCT Construct

Reconfiguration Routines & Orchestration DT functions as the active orchestration of a set of reconfiguration routines and architectures reshaping resources (processes, data platforms, governance) to embed digital technologies into the organization (Vial, 2019). In the language of DCT, DT is the reconfigure stage the managerial routines and architectural changes that convert AI inputs into company-wide capabilities. DT maturity (in terms of data architectures, process digitization scores, governance frameworks and integration layers) operates as the proximate mechanism for the institutionalization of AI. DCT suggests that there will be no sustained organizational impact of sensing/seizing offered by AI in the absence of effective reconfiguration routines (DT).

Knowledge Management Effectiveness (Dependent Variable) and DCT Construct

Performance Outcome of Reconfigured Capabilities

KM Effectiveness (acquisition, storage/organization, sharing/application, capture of tacit knowledge) is the delivery of capability output from re-configured capabilities. In both DCT, performance enhancements also happen when reconfiguration makes new capabilities routinized here, as DT where AI is embedded in KM workflow and performance improvements are realized, functionally, everywhere (Jie et al., 2025; Mohaghegh et al., 2025).

Conclusion of the Study

The purpose of the current research was to systematically feel and reflect on AI impact on KM in the context of DT, and to advance a theoretically consolidated model the conditions the relationship between AI, KM and DT. The intended purpose was to not only distill the current state of knowledge, but also to lay the conceptual groundwork for generating hypotheses to be empirically tested. As a mediating role of digital transformation, this paper expands the conversation about to what extent AI capability matters for the knowledge management performance in Pakistani organizations.

The objectives of the study corresponded with examining the status of AI use in KM practice, as well as with identifying obstacles, investigating the mediating role of DT, and suggesting practical guidelines. These goals are important because they meet practical needs facing organizations in Pakistan and contribute to theoretical gaps in research internationally. As the review of the literature clearly suggests that the developed countries or even nations which are continuing in an upgrading process have already integrated AI with their KM management activities, rather than this being true from a developing country standpoint such as Pakistan: there may be resource and cultural problems. (Chong et al. 2024) Moreover, it reveals the necessity of further

localized research, which frames international experience in the specific socio-economic and organizational context of Pakistan.

The significance of this study is twofold in theory and practical application. In terms of theory, it unifies AI, DT and KM into a unified framework based on Dynamic Capabilities Theory (Teece, 2007). This creates an important base as the theory shows that while companies have acquired capabilities to sense opportunities through AI routines for DT, they capture these with routines and KM efficiency through reconfiguring resources. With practical and policy implications, this model is beneficial to organization and government need to be able help integrate their AI uptake strategies into overall digital transformation moves in Pakistan which will improve what is an information stream for decision-making and innovation (Government of Pakistan, 2022).

With reference to the literature, it was discerned that artificial intelligence could definitely increase acceptance of information the frequency with which it is stored and distributed, and how tacit knowledge is attainable form but in technical programs such as digital change projects (Vial 2019; Bharadwaj et al with others 2023).

According to the result of this literature review, AI can greatly improve the acquisition and storage of knowledge, dissemination processes over its tacit knowledge. However, for much greater potential to be released must be mediated through digital transformation programs rather than just surrendered to expostulation.

Implications of the Study

The implications of this study are considerable both in terms of theory and in practice. It encompasses practice in terms of how artificial intelligence (AI) the digital transformation of studies, and knowledge management (KM). The classic example of such an extension comes from DT, very powerful in mediating the impact on KM efficiency that AI adoption produces. The study reinterprets models for the production of knowledge management software in the areas of responsibility and interest concerning economic efficiency. Grounding the model in Dynamic Capabilities Theory (Teece, 2007), this research is also a contribution to what is relevant academic literature about how firms are capable of perceiving opportunities under AI, turning them digital transformation, then reconfiguring resources for better KM performance. With this theoretical construction principle, the research contributes to contemporary KM and digital transformation literature.

As such, it is the uptake and integration of these tools rather than the tools themselves that managers, policy makers and practitioners need to be concerned with -together with the embedding in broader digital transformation strategies encapsulating process re-design, governance frameworks and capability development. This is expected to work in tolerating impediments stemming from for example limited infrastructure, change resistance, and shortage of skilled workers (International Telecommunication Union, 2021; World Bank, 2020). Moreover, by identifying the sectoral applications in banking, health, education, and libraries, our study provides sector-specific implications to facilitate the government's digital Pakistan vision (Government of Pakistan, 2022).

Future Research Directions

Empirical Testing of the Model: The first avenue is to empirically validate the proposed conceptual model in organizational setting of Pakistan. Further research needs to use quantitative methods (e.g., structural equation modeling, SEM) to confirm the mediating role of digital transformation and test the proposed relationships between AI, DT and KM effectiveness.

Scale Development and Validation. Future research could also consider construction of new scales and items that are indigenous in nature to Pakistan. Existing scales used to measure AI capability, digital transformation maturity, and KM effectiveness are typically brought about in Western countries. The development of locally influenced culturally sensitive scales would enhance the validity of the measurements and the development of instruments for future empirical studies in similar transition economies.

Sectoral and Comparative Studies: Although this study offers a broad framework, we suggest that, in future` research, sector-specific differences in AIEA organization of KM via DT may be compared (i.e. knowledge based [health and education] versus data-driven sectors (banking and IT). Longitudinal studies can further explore the change of relationships as digital transformation initiatives are implemented and mature.

References

Ali, S., et al. (2024). Knowledge, awareness and practice of artificial intelligence and types of realities among healthcare professionals: A nationwide survey from Pakistan. Pakistan Journal of Medical Sciences, 40(3), 38711703. https://pubmed.ncbi.nlm.nih.gov/38711703/

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120.

Bharadwaj, A., El Sawy, O. A., & Pavlou, P. A. (2025). Digital business strategies: Toward a new strategy framework. Journal of the Academy of Marketing Science, 53(2), 173-193. https://doi.org/10.1007/s11747-024-00610-2

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. MIS Quarterly, 37(2), 471–482.

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2023). Digital business strategy: Toward a next generation of insights. MIS Quarterly, 47(2), 567–590. https://doi.org/10.25300/MISQ/2023/17418

Brown, T. B., et al. (2020). Language models are few-shot learners. Advances in Neural Information Processing Systems, 33, 1877-1901.

Brynjolfsson, E., & McAfee, A. (2017). The business of artificial intelligence. Harvard Business Review, 95(4), 56-66.

Chen, Y., Argentinis, J. D. E., & Weber, G. (2016). IBM Watson: How cognitive computing can be applied to big data challenges in life sciences research. Clinical Therapeutics, 38(4), 688-701.

Choi, B., & Lee, H. (2025). AI in knowledge management: Challenges and solutions. Journal of Knowledge Management, 29(3), 355-372. https://doi.org/10.1108/JKM-12-2024-0559

Chong, A. Y. L., Li, B., & Tan, B. (2024). The impact of artificial intelligence on organizational knowledge management: A review and research agenda. International Journal of Information Management, 56, 101640. https://doi.org/10.1016/j.ijinfomgt.2023.101640

Chong, C. S., Lai, Y., & Lim, W. M. (2024). Artificial intelligence in knowledge management: A review and research agenda. Journal of Knowledge Management, 28(3), 455–478. https://doi.org/10.1108/JKM-02-2024-0123

Davenport, T. H., & Prusak, L. (2024). Working knowledge: How organizations manage what they know (2nd ed.). Harvard Business Press.

Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. Harvard Business Review, 96(1), 108–116.

Deloitte. (2024). Realizing value from digital transformation investments. (Deloitte)

European Commission. (2020). Horizon 2020: Work programme 2018-2020. European Union Publications.

Evidence Based Library and Information Practice. (2024). Organizational readiness to adopt artificial intelligence in the library and information sector of Pakistan. Evidence Based Library and Information Practice, 19(1), 45–60. https://journals.library.ualberta.ca/eblip/index.php/EBLIP/article/view/30408

Fu, Y., Xu, N., Fang, X., & Ren, J. (2025). The impact of artificial intelligence on digital enterprise innovation: A theoretical framework. Digital Business, advance online publication. (ScienceDirect)

Gartner. (2024). Hype cycle for artificial intelligence 2024. Gartner, Inc.

Gelashvili-Luik, T., Vihma, P., & Pappel, I. (2025). Navigating the AI revolution: Challenges and opportunities for integrating emerging technologies into knowledge management systems—A systematic literature review. Frontiers in Artificial Intelligence, 8, 1664837.

Glean. (2024, December 4). Retrieval-augmented generation (RAG): The key to enabling generative AI for the enterprise. (Glean)

Government of Pakistan. (2022). Digital Pakistan policy framework. Ministry of Information Technology and Telecommunication.

International Telecommunication Union. (2021). Measuring digital development: Facts and figures 2021. ITU Publications.

Investor's Business Daily. (2025, September 4). How generative AI is shaking up enterprise software. (Investors.com)

Jain, S., Gupta, P., & Malhotra, N. (2024). Artificial intelligence in knowledge management: A conceptual framework. Information & Management, 61(4), 101491. https://doi.org/10.1016/j.im.2024.101491

Jarrahi, M. H., Daniel, S., & others. (2023). AI and knowledge management: Emerging configurations in organizations. Business Horizons, 66, 1–10. (Overview via ScienceDirect). (ScienceDirect)

Jie, H., Wang, Y., & Li, X. (2025). Digital maturity, dynamic capabilities and innovation in high-tech SMEs. Technovation, advance online publication. (ScienceDirect)

K2View. (2024). Gartner LLM report: RAG tips for grounding LLMs with enterprise data. (K2view)

Klein, L. S., & Zeng, L. (2025). AI in knowledge management: A systematic review of academic literature. Knowledge Management Research & Practice, 23(1), 40-56. https://doi.org/10.1080/14778238.2024.1818367

Kumar, R., Singh, A., & Gupta, P. (2025). AI-enabled knowledge ecosystems: Opportunities and challenges for emerging economies. Technological Forecasting and Social Change, 203, 123456. https://doi.org/10.1016/j.techfore.2025.123456

Kumar, V., Singh, R., & Sharma, S. (2025). The role of artificial intelligence in knowledge retrieval and management: A case study of AI-enabled knowledge systems. Journal of Knowledge Management, 29(6), 891-911. https://doi.org/10.1108/JKM-12-2024-0583

Lai, Y., Liao, Z., & Su, H. (2024). A study on the use of artificial intelligence in knowledge management and decision-making. Decision Support Systems, 150, 113276. https://doi.org/10.1016/j.dss.2023.113276

Liebowitz, J. (2019). Building organizational intelligence: A knowledge management primer. CRC Press.

Ma, J., Shang, Y., & Liang, Z. (2025). Digital transformation, artificial intelligence and enterprise innovation performance. Finance Research Letters, 78, 107190.

MarketsandMarkets. (2021). Artificial intelligence market by offering, technology, deployment mode, organization size, business function, vertical, and region - Global forecast to 2025. Market Research Report.

Microsoft. (2022). AI for agriculture in India: Empowering farmers through knowledge management. Microsoft AI for Good Initiative.

Microsoft. (2022). AI for agriculture: Empowering farmers with data-driven insights. Microsoft Case Studies.

MIT Center for Information Systems Research (CISR). (2024, December 19). Building enterprise AI maturity. (cisr.mit.edu)

Mohaghegh, M., et al. (2025). The mediating role of triple-A supply chain capabilities in digital transformation's impact on performance. Journal of Business & Industrial Marketing.

Mohaghegh, M., et al. (2025). The mediating role of triple-A supply chain capabilities in digital transformation's impact on performance. Journal of Business & Industrial Marketing, advance online publication. (Emerald)

Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company: How Japanese companies create the dynamics of innovation. Oxford University Press.

Rezaei, M. (2025). Artificial intelligence in knowledge management: Identifying and addressing the key implementation challenges. Technological Forecasting & Social Change, 217, 124183. (IDEAS/RePEc)

Sadiq, F., et al. (2024). Knowledge, attitude, and practice regarding the use of artificial intelligence in hospital settings in Mardan, Khyber Pakhtunkhwa, Pakistan. Pakistan Journal of Medical Sciences, 40(4), 39781175. https://pubmed.ncbi.nlm.nih.gov/39781175/

Smith, C., & Williams, R. (2025). Tacit knowledge and AI: An exploration of human-machine collaboration. Management Decision, 63(2), 419-431. https://doi.org/10.1108/MD-02-2024-0730

Taherdoost, H. (2023). Artificial intelligence and knowledge management: Impacts and challenges. Computers, 12(4), 72. (MDPI)

TechRadar Pro. (2025, August 12). Why AI and RAG need document management. (TechRadar)

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319–1350.

United Nations. (2021). Technology and innovation report 2021: Catching technological waves. UNCTAD.

Vărzaru, A. A., Bocean, C. G., & others. (2024). Digital transformation and innovation: The influence of AI, big data, cloud, and IoT on innovation revenues. Systems, 12(9), 359. (MDPI)

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. Journal of Strategic Information Systems, 28(2), 118–144.

Voigt, P., & Von dem Bussche, A. (2017). The EU General Data Protection Regulation (GDPR): A practical guide. Springer.

Wawira Gichoya, J., et al. (2018). AI in global health: Opportunities and challenges in low-resource settings. The Lancet Digital Health, 1(5), e203-e204.

Wawira Gichoya, J., et al. (2018). AI-powered chatbots for health education in low-resource settings: Opportunities and challenges. BMJ Global Health, 3(2), e000543.

Westerman, G., & Bonnet, D. (2024). Leading digital: Turning technology into business transformation. MIT Sloan Management Review Press.

Westerman, G., & Bonnet, D. (2024). Predicting digital transformation: Insights from 2024. MIT Sloan Management Review, 66(3), 10-19.

World Bank. (2020). Digital development in developing economies: Challenges and opportunities. World Bank Publications.

Wu, W., Wang, B., & Liu, Y. (2024). Mediation effect of knowledge management on the impact of IT capability on firm performance. Frontiers in Psychology, 15, 1344330. (Frontiers, PMC)

Zhao, J., Li, X., & Huang, X. (2024). The ethical implications of AI in knowledge management. AI & Society, 39(1), 1-17. https://doi.org/10.1007/s00146-024-01344-4