Full Length Research

Investigating the intersection of big data and knowledge management: opportunities and challenges in Nigeria

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The integration of Big Data and Knowledge Management (KM) presents significant transformative potential for organisations and institutions worldwide. In the context of Nigeria, a developing economy with increasing digital penetration and data generation, the intersection of big data and knowledge management (KM) offers a unique landscape of opportunities and challenges. This study investigates intersection of big data and knowledge management: opportunities and challenges particularly in the Nigerian context, where infrastructural, organisational, and policy related issues play critical roles. The research explores current state of big data and knowledge management, opportunities of leveraging big data and knowledge management, challenges of leveraging big data and knowledge management, impact of big data and knowledge management on economic growth, innovation and national competitive, cultural and organisational barriers to big-data and knowledge management. Using a systematic review approach that combines literature review, expert interviews, and case studies across sectors such as finance, healthcare, and education, the study identifies key enablers and barriers to the adoption of big data driven knowledge management (KM) systems. Findings reveal that while Nigerian organisations increasingly recognise the value of data-driven knowledge processes, they face barriers such as absence of a knowledge sharing culture, reluctance to share knowledge, weak integration of knowledge management, limited technical infrastructure, inadequate data governance frameworks, and concerns around data privacy and security. Despite these obstacles, the study highlights considerable opportunities: improved policy-making, enhanced customer insights, more efficient resource management, and the potential for predictive analytics to drive proactive strategies. The research concludes by proposing a framework for implementing Big Data-enabled KM in Nigeria, emphasising the need for strategic investment, cross-sector collaboration, capacity building, and supportive regulatory policies.

Keywords: Big Data, Knowledge Management, Opportunities, Challenges, Nigeria.

INTRODUCTION

Humanity in the last two decades of this century has found itself immersed in various confluences, faced with scenarios of multiple and accelerated transformations that have determined fundamental adaptations for countries and their societies. Although these changes indeed occur, other scenarios remain historically. For example, the great contradictions and deep inequalities still prevail. Knowledge is the central object for achieving sustainable development, inclusive well-being, and quality of life from any context. Wisdom is associated with the product, and it is said that the more knowledge a nation has, the more skilled it is for its social and economic development. Thus, access to expertise represents a comparative advantage for any individual or nation in the different areas of human performance. The production and competitiveness are defined by an input added value, such as the knowledge expressed in workers' intellectual contributions to their organisations, including the contributions that citizens make to the societies both publicly and privately (Hernández, Ravina, Chumaceiro & Tobar, 2021). Therefore, knowledge has revolutionized economic and technological globalization, being the mainstay of the experienced transformations.

The advent of big data and knowledge management (KM) has transformed the way organizations operate, make decisions, and create value. However, Nigeria, like many other developing countries, faces significant challenges in harnessing the potential of Big Data and KM to drive economic growth, innovation, and competitiveness. Knowledge is the central object for achieving sustainable development, inclusive well-being, and quality of life from any context. Organisations employ various tools and technologies to support KM efforts. These include document and content management systems, intranets, enterprise social networks, customer relationship management systems, knowledge bases, wikis, and increasingly, artificial intelligence and machine learning applications. These tools help capture, store, and disseminate information efficiently, allowing employees to collaborate and innovate more effectively (Alavi, & Leidner, 2001). Data, and eventually Big Data, is generated from practically everywhere; e.g., social media sites (Facebook, Instagram,Twitter, Linkedin), digital pictures and videos, e-mails, purchase transaction records, cell phone, global positioning system (GPS) signals, smart household appliances, meteorological sensors, to name a few (Alunge, & Alunge,2018).

The primary objective of knowledge management is to harness both explicit and tacit knowledge within an organisation to enhance performance and innovation. KM helps organisations avoid duplication of effort, reduce knowledge loss due to staff turnover, and streamline operations. It encourages collaboration, promotes a culture of continuous learning, and supports strategic goals by ensuring that the right knowledge is available to the right people at the right time.KM comprises several key components. People are at the heart of KM, as they create and share knowledge. Cultivating a culture that values knowledge sharing is critical. Processes are another core element, involving structured methods to capture, store, and disseminate knowledge. Technology plays a supportive role, offering platforms and tools that facilitate the storage, retrieval, and exchange of knowledge. Finally, strategy is essential; a well-aligned KM strategy ensures that efforts are coordinated with the organization's broader objectives and are supported by leadership and appropriate resource allocation.

Looking forward, the future of knowledge management is being shaped by emerging technologies such as artificial intelligence, machine learning, and big data analytics. These technologies are making KM more dynamic and responsive, allowing organisations to deliver personalized knowledge in real time and automate knowledge discovery. KM is increasingly being integrated into the flow of work, enabling smarter and more agile operations. Knowledge management is a vital discipline that helps organizations unlocks the full potential of their intellectual assets. By creating systems and cultures that encourage the flow of knowledge, organizations can become more innovative, efficient, and resilient. As competition and complexity increase, those who manage knowledge effectively will be better positioned to adapt, thrive, and lead in their industries.

Yazdani, Bayazidi and Mafi (2020) opined that organisation in the age of knowledge is an organisation that is based on the best available knowledge and information. To succeed in today's challenging organisational environment, organizations need to learn from past mistakes rather than repeating those mistakes. This process occurs through knowledge management (Bart, 2020). Knowledge management (KM) is important, especially for organisations that their successes depend on the production, use and integration of knowledge by professionals and employees. KM is a new field in the academic environment, and many universities are actively involved in related activities in this field (Hsia, Lin, Wu,& Tsai (2016).

Conferences and seminars are taking place at the national and international levels in this regard. In the field of education, due to the need to explore the power and intellectual capital available to share experiences, this area has been very much considered (Prusak ,2021).All knowledge production organisations such as research, development centers and higher education institutions from colleges to universities are looking for new concepts in their favorite subject. They also help create knowledge through various programs, considered as "knowledge houses"(Laal 2011) so, the knowledge of the professors flows to the students and new knowledge is produced. Information is created in various

forms and sources such as books, articles, dissertations, reports, and more. Knowledge management helps these institutions to enhance the capacity to collect information and knowledge and apply it to problem solving and decision making (Pircher & Pausits, 2021).Therefore, evidence shows that any academic institution is associated with knowledge. In these institutions, the information and knowledge gained in the scientific community's core area should be disseminated for further growth. But, there are challenges in this direction. Studies have demonstrated that knowledge created in educational institutions is not properly stored and obtained. Most of the time, knowledge created in that system remains unknown and is considered as gray literature. The academic environment is considered as the knowledge houses, but if the generated knowledge in that organisation is not properly organized, it will minimize its usefulness and leads to repeat activities (Yazdani, Bayazidi & Mafi, 2020). Despite the potential benefits of big data and KM, Nigerian organisations face numerous challenges in adopting and effectively utilizing these technologies. The country's inadequate infrastructure, limited technological expertise, and cultural and organisational barriers hinder the effective collection, storage, analysis, and application of big data and knowledge management. Furthermore, the lack of awareness, inadequate skills, and limited resources among Nigerian organizations impede the adoption and effective use of knowledge management (KM) practices. Despite these benefits, implementing knowledge management can be challenging. One major obstacle is cultural resistance employees may hesitate to share what they know out of fear of losing job security or due to a competitive mindset. Other challenges include lack of leadership support, poor alignment of technology with user needs, and difficulty in capturing tacit knowledge.

Additionally, the risk of information overload can undermine the goal of making knowledge useful and accessible. However, the adoption of big data analytics in Nigeria is not without challenges. A study examining factors influencing the adoption of cloud enterprise resource planning (ERP) and Big Data analytics identified several determinants, including relative advantage, complexity, compatibility, trialability, observability, ICT infrastructure, top management support, and regulatory environment. These factors highlight the multifaceted considerations organisations must address to successfully implement big data solutions. Therefore, the current studies examine the investigating the intersection of big data and knowledge management: opportunities and challenges in Nigeria.

Literature review

Concept of knowledge management

Knowledge Management (KM) is a multidisciplinary approach that focuses on achieving organisational objectives by making the best use of knowledge. In today's information-driven world, knowledge has emerged as one of the most vital assets an organisation can possess. KM involves a systematic process of identifying, creating, capturing, organizing, sharing, and utilizing knowledge to foster learning, innovation, and improved decision-making. This process enables organisations to leverage collective expertise, enhance productivity, and maintain a competitive edge (Alavi, & Leidner, 2001). According to Gartner (2022), knowledge is generally distinguished from data and information. While data represents raw facts and figures, and information is data given meaning and context, knowledge is the deeper understanding that emerges from the application and interpretation of information. Knowledge allows individuals and organisations to make informed decisions and take effective action. It can be classified into different types: explicit knowledge, which is documented and easily shared through manuals, databases, and reports; tacit knowledge, which is personal, experience-based, and often difficult to articulate; and embedded knowledge, which resides within organisational processes, products, culture, and norms.

Knowledge Management is a broad area. It has been, and remains, both a blessing and a curse. There is scope for contributions from any area of expertise, and the potential for cross-fertilization between the understandings of different disciplines. The literature reflects this, with inputs from sociology, economics, finance and accounting, computer science, library and information science, human resource management and operational research/management science (John & Lönnqvist, 2023). Knowledge is the central object for achieving sustainable development, inclusive well-being, and quality of life from any context (Hernández, Ravina, Chumaceiro, &Tobar, 2021).

Current state of Big Data and Knowledge Management (KM) in Nigeria

In recent years, Nigeria has witnessed significant advancements in both big data and Knowledge Management (KM), reflecting a global trend towards data-driven decision-making and efficient information utilization. These developments are evident across various sectors, including healthcare, finance, and education, indicating a growing recognition of the importance of data and knowledge in enhancing organizational performance and national development (Ajayi, & Ogunleye, 2023).

This development is part of the most recent strategic management trends to explain its vision, based on the knowledge that generates multi-dimensional strategies to create value. The 21st century company or organisation must integrate capacities that allow the creation, evolution, and recombination of resources into a new competitive advantage source (Korshenkov & Ignatyev, 2020; Laužikas & Miliūtė, 2020). This systematic process of generating new abilities through routine learning processes has been called dynamic capabilities (HernándezLinares et al, 2020; Kurtmollaiev, 2020; Schilke et al, 2018; Schoemaker et al, 2018; Teece, 2018).

The current of big data analytics in Nigeria is gaining momentum as organisations seek to improve operational efficiency and competitiveness. A study focusing on lending firms in Nigeria demonstrated that the adoption of big data analytics significantly enhances risk mitigation and decision-making processes. The research employed linear regression analysis, revealing a statistically significant relationship between Big Data analytics adoption and improved performance indicators in these firms (Anake, & Okeke, 2023). This underscores the potential of data analytics in transforming business operations within the Nigerian financial sector.

In the healthcare sector, big data analytics is being utilised to address operational challenges. (Jimoh, & Abdullahi, 2023) conducted a study in Lagos State investigated the impact of big data analytics on healthcare service firms, highlighting its role in enhancing operational value. Despite the strategic importance of healthcare in Nigeria, the sector faces underfunding and resource constraints. The study suggests that leveraging big data can improve service delivery and resource management, thereby addressing some of these challenges. Despite the progress, several challenges hinder the widespread adoption of big data and KM practices in Nigeria. One significant issue is the skills gap; particularly in the context of Africa's green energy transition (Reuters, 2024).the shortage of skilled professionals hampers the development and maintenance of projects that rely on advanced data analytics and knowledge management. Addressing this gap through targeted training programs is essential for sustainable development (Osabutey, & Jin, 2022).

The current state of big data and knowledge management in Nigeria is characterised by a growing awareness of their potential benefits and an increasing number of implementation efforts across various sectors. While challenges such as infrastructural deficits, regulatory concerns, and skills shortages persist, ongoing initiatives and research indicate a positive trajectory towards a data-driven and knowledge-centric economy. Continued investment in infrastructure, education, and policy frameworks will be crucial in overcoming existing barriers and fully harnessing the transformative power of big data and knowledge management in Nigeria (World Economic Forum, 2024)

Opportunities of leveraging Big Data and KM in Nigeria

Nigeria stands at a pivotal point in its journey towards embracing digital transformation, with big data and knowledge management (KM) offering immense potential for socio-economic development. As the country's population, internet penetration, and mobile usage continue to grow, so does the volume of data generated across sectors such as healthcare, finance, education, and agriculture. Leveraging big data and KM provides an opportunity to unlock actionable insights, drive innovation, enhance public service delivery, and foster informed decision-making in both the public and private sectors (Ajayi, & Ogunleye, 2023). One of the foremost opportunities lies in economic growth and competitiveness**.** Big data analytics can help businesses identify market trends, understand consumer behavior, and improve operational efficiency. When coupled with robust KM practices, organisations can harness institutional knowledge to refine strategies, avoid redundancy, and maintain continuity even amid workforce changes. In sectors like banking and finance, the integration of data analytics is already streamlining credit assessments and fraud detection, contributing to financial inclusion and stability.

Knowledge management systems (KMS) have witnessed a significant uptick in adoption across multiple industries, spurred by the rise of data-intensive operations and remote work requirements (Deloitte, 2023). Recent real-time survey data suggest that organizations are increasingly recognizing the value of KMS in improving operational efficiency, fostering innovation, and enhancing strategic decision-making (Munikrishnaiah,Thiyagarajan, Rutul ,Piyush, Bhadrappa,& Navjyot, 2025). A consolidated view of this trend is presented in Table, which shows the reported adoption rates and primary benefits of KMS across five major sectors.

KMS Adoption Rates and Key Benefits by Industry (2023)

S/N	Industry	Adoption Rate (%)	Primary KMS Benefit
1	Manufacturing	68	Accelerated process optimization
2	Financial Services	75	Enhanced compliance & informed decision
3	Healthcare	62	Streamlined cross-departmental sharing
4	Technology	80	Rapid innovation & product development
5	Retail	64	Improved customer insights & efficiency.

According to the survey, the technology sector leads with an 80% adoption rate, primarily because tech companies often experiment with cutting-edge collaboration tools and aim to streamline knowledge transfer among geographically dispersed teams (Alavi & Leidner, 2001). In the financial services domain, adoption stands at around 75%, driven by compliance mandates that require robust data storage, audit trails, and systematic retrieval (Davenport & Prusak, 1998). Meanwhile, the Healthcare industry, at 62%, underscores the need for secure and rapid exchange of patient and research data across different departments (Oracle, 2022).

Public service and governance can also benefit immensely from the combination of big data and KM. Government agencies can use real-time data to track infrastructure projects, monitor health epidemics, manage urban development, and improve resource allocation. For example, during the COVID-19 pandemic, the Nigerian Center for Disease Control (NCDC) utilized digital dashboards and data analytics tools for monitoring infection rates and managing vaccine logistics. With proper knowledge capture and dissemination practices, such institutional memory can inform future crisis response strategies.

Healthcare: In healthcare, the application of Big Data can lead to predictive diagnostics, improved patient care, and better allocation of scarce resources. KM can assist in preserving valuable medical knowledge and protocols that enhance treatment outcomes and standardize service delivery.

Agriculture: Similarly, agriculture a critical sector in Nigeria's economy can benefit from data-driven approaches for crop forecasting, climate adaptation, and supply chain optimization, while KM can support knowledge transfer between research institutions and rural farmers.

Challenges of Leveraging Big Data and Knowledge Management in Nigeria

Despite the growing recognition of KMS as pivotal to organizational success, implementing such systems often presents various challenges. These impediments can manifest across cultural, technological, and operational domains. Thus, implementation of big data and knowledge management (KM) in Nigeria, while offering enormous potential, faces several deep-rooted and systemic challenges. These barriers span infrastructure, skills, organisational culture, policy, and ethics posing significant limitations to the full realisation of data-driven innovation and knowledge-based governance.

- **Infrastructure inadequacy**: One of the most pressing challenges is infrastructure inadequacy, particularly regarding internet access and electricity. Despite Nigeria's digital growth, broadband penetration remains uneven across urban and rural areas. According to the *National Broadband Plan (2020–2025)*, the country aims for 70% broadband coverage by 2025, but many rural communities still lack reliable internet connectivity. This digital divide severely limits the ability of organizations to gather, process, and utilize Big Data efficiently. Similarly, frequent power outages and underdeveloped ICT infrastructure hinder consistent access to digital tools needed for both data analytics and KM systems (NITDA, 2021).

- **Shortage of skilled professionals**: Another significant constraint is the shortage of skilledprofessionals. Big data analytics and KM both require specialized expertise in areas such as data science, database management, artificial intelligence, and information systems. However, the current education and vocational training systems in Nigeria have not yet evolved to meet these demands. A report by Reuters (2024) emphasised that the talent gap is particularly acute in sectors requiring advanced digital competencies, such as health technology, fintech, and e-governance. Without a sufficient pool of qualified professionals, organizations struggle to effectively design, implement, and maintain KM platforms or interpret and act on big data insights.

- **Low awareness and organizational resistance to change**: The challenge is further compounded by low awareness and organizational resistance to change. Many Nigerian institutions especially within the public sector operate with rigid, hierarchical structures that discourage knowledge sharing. The concept of KM is often misunderstood or undervalued, leading to limited institutional support. As observed by Osabutey and Jin (2022), asset management departments in Nigerian public organisations often lack structured KM policies, resulting in knowledge silos and poor information flow. Similarly, many businesses do not yet have a culture that promotes the strategic use of data, and decisions are frequently based on intuition rather than data insights.

- **Data privacy and regulatory issues** also present substantial hurdles. Although the Nigeria Data Protection Regulation (NDPR) was introduced in 2019 to guide data governance, enforcement remains weak, and awareness is limited among stakeholders. This creates a trust deficit among users and consumers, making it difficult to collect, process, and share data responsibly. In the context of KM, the absence of strong data protection laws may also discourage organizations from capturing and sharing sensitive internal knowledge, especially if they fear legal repercussions or security breaches (NITDA, 2021).

- **Lack of interoperability and integration between systems**: A further challenge lies in the lack of interoperability and integration between systems. Many government ministries, departments, and agencies (MDAs) operate with siloes systems, using different data formats and storage protocols. This lack of standardization makes it difficult to consolidate and analyze data across sectors. It also undermines KM efforts, as fragmented information systems impede seamless knowledge capture, archiving, and retrieval. For example, a study by Jimoh and Abdullahi (2023) found that even where cloud ERP systems and big data tools are adopted, their effectiveness is limited by poor integration with existing legacy systems.

- **Financial constraints** are another notable barrier. Setting up and maintaining Big Data infrastructures such as data centers, analytics platforms, and secure servers requires significant investment. For many Nigerian SMEs and public institutions, budgetary limitations make it challenging to adopt these technologies at scale. Even when international support or pilot funding is available, there are often sustainability issues due to lack of long-term funding and local ownership.

- **Knowledge retention and continuity** present a unique challenge in Nigeria's workforce. Frequent staff turnover, especially in the public sector, means that tacit knowledge is often lost when experienced personnel leave. Without proper KM systems in place to capture and institutionalize this knowledge, organizations lose valuable insights that could inform policy and operations. Law Pavilion (2024) highlighted this issue in the legal sector, where firms that implemented KM systems saw significant improvements in continuity, compliance, and efficiency, while those without such systems faced recurring setbacks.

Nevertheless, big data and knowledge management have the potential to transform Nigeria's economy and governance, a range of structural, technical, and cultural challenges must be addressed to unlock their full value. These include improving digital infrastructure, bridging the skills gap, fostering a culture of collaboration and knowledge sharing, strengthening legal and regulatory frameworks, and ensuring interoperability of systems. Addressing these challenges will require coordinated efforts between government, academia, private sector, and international partners to build an inclusive, knowledge-driven digital economy.

The Impact of Big Data and Knowledge Management on Economic Growth, Innovation, and Competitiveness in Nigeria

In today's rapidly evolving global economy, big data and knowledge management (KM) have become essential drivers of transformation, particularly in developing countries like Nigeria. These tools offer the potential to catalyze **economic growth**, stimulate **innovation**, and enhance **national competitiveness** by enabling data-driven decision-making, fostering collaboration, and facilitating continuous learning and adaptation across sectors.

i. **Economic growth**: One of the most profound impacts of Big Data and KM is their contribution to economic growth through improved efficiency and productivity. Big Data allows organizations to analyze massive volumes of information to identify patterns, optimize operations, reduce costs, and make informed decisions. In Nigeria's financial sector, for example, banks and fintech companies use predictive analytics to assess credit risk, detect fraud, and offer personalized services thereby increasing financial inclusion and driving economic participation (Ajayi & Ogunleye, 2023). Knowledge Management complements this by ensuring that organizational knowledge is effectively captured, shared, and reused, avoiding duplication and enhancing strategic planning. Together, they enable more agile and intelligent business operations, which are critical in a dynamic and competitive economy.

ii. **Innovation**: The integration of big data and KM also stimulates innovation, particularly in sectors like agriculture, education, and healthcare. In agriculture, data analytics is used to forecast weather patterns, assess soil quality, and optimize supply chains while KM facilitates the sharing of indigenous farming techniques and research-based knowledge

among farmers, researchers, and policy-makers. Similarly, Nigeria's emerging edutech sector benefits from analytics to track student performance and engagement, while KM helps in curating and disseminating teaching resources. These innovations not only enhance sectorial productivity but also create employment and promote entrepreneurship.

iii.   **National competitiveness**: The impact on national competitiveness is equally significant. As the global economy becomes more knowledge-intensive, countries that can effectively harness data and knowledge are better positioned to compete. Nigeria's ability to use big data for policy formulation, urban planning, and business intelligence enhances its appeal to investors and international partners. Knowledge management ensures that best practices, lessons learned, and strategic insights are retained and applied, which enhances institutional memory and resilience. According to Osabutey and Jin (2022), Nigerian public organizations that implemented KM practices experienced improved performance and accountability factors that are crucial in a globally competitive environment. According to Iftikhar, Ali and Shah, (2021). In the dynamic marketplace where supply chains are competing with other supply chains, competitiveness is gained through the knowledge of SC partners. As a result, knowledge management (KM) has emerged as an important field of study within the supply chain management domain (Ali & Gurd, 2020).

iv.   **Public sector**, in the public sector big data and KM are improving service delivery and governance, which indirectly contributes to economic stability and trust. Government agencies can leverage data analytics for real-time monitoring of infrastructure projects, public health surveillance, and disaster response. For instance, during the COVID-19 pandemic, Nigeria's health agencies used data dashboards and mobile data to monitor cases and vaccine distribution (Anake & Okeke, 2023). KM frameworks ensure that such knowledge is institutionalized and accessible for future policy development, reducing response time in future emergencies and improving public confidence in governance structures.

v.   **Healthcare**: In healthcare, big data is transforming patient care through predictive diagnostics, electronic health records, and resource planning. Anake and Okeke (2023) note that private healthcare providers in Lagos State have begun integrating data-driven systems to improve operational outcomes. KM plays a critical role in standardizing medical procedures, training healthcare professionals, and preserving clinical knowledge that can improve service quality across the board. These enhancements lead to better population health an essential component of human capital development, which underpins economic growth.

Despite these gains, it is worth noting that the full impact of big data and KM is constrained by systemic challenges such as inadequate infrastructure, data silos, and skill shortages. Nevertheless, the growing adoption of these tools across sectors signals a shift towards a more efficient, innovative, and competitive national economy. With continued investment in digital infrastructure, capacity building, and policy support, Nigeria can fully unlock the transformative potential of Big Data and Knowledge Management.

Cultural and Organizational Barriers to the Adoption and Effective Use of Knowledge Management Practices in Nigeria

The implementation of Knowledge Management (KM) in Nigeria holds significant potential to enhance institutional effectiveness, innovation, and competitiveness. However, the adoption and integration of KM practices remain hindered by a range of cultural and organizational barriers deeply rooted in institutional norms, societal values, and systemic inefficiencies. These barriers not only slow down the uptake of KM systems but also compromise their sustainability and overall impact across both public and private sectors.

i.   **Reluctance to share knowledge**: A key cultural barrier is the reluctance to share knowledge, which stems from traditional beliefs, job insecurity, and organizational power dynamics. In many Nigerian institutions, knowledge is often treated as a personal asset or a source of competitive advantage rather than a shared organizational resource. Employees may hoard knowledge out of fear that sharing it could reduce their relevance or make them expendable in environments where job security is uncertain. This mindset undermines the core objective of KM, which is to foster collaboration and collective learning. As observed by Osabutey and Jin (2022), many public sector workers view knowledge as a means of retaining power, leading to silos that weaken institutional performance.

ii.   **Absence of a knowledge-sharing culture**: Unlike in some knowledge-driven societies where collaborative work is incentivized, many Nigerian organizations lack formal policies or cultural reinforcements that encourage open

knowledge exchange. Employees are rarely rewarded for contributing to shared repositories or mentoring junior colleagues. This cultural gap limits the informal and tacit knowledge transfer that is essential to KM, particularly in complex fields like healthcare, engineering, and academia (Ogbari et al., 2018).

iii.   **Leadership and management practices** also play a crucial role in shaping organizational culture around KM. In Nigeria, leadership styles are often hierarchical and top-down, leaving little room for participatory decision-making or innovation from lower-level staff. This discourages knowledge flow across organizational levels. Moreover, many leaders lack awareness or understanding of KM concepts, and as a result, do not champion KM initiatives or allocate resources toward them. A study by Egbu (2020) highlights that KM adoption in Nigerian construction firms was hampered by leadership that did not value knowledge as a strategic asset, leading to inconsistent or failed implementation.

iv.   **Lack of clear KM policies and frameworks** within organisations is another organizational barrier. Many Nigerian institutions, especially in the public sector, do not have dedicated KM strategies or infrastructure in place. KM efforts are often ad hoc and fragmented, without formal processes for knowledge capture, storage, and retrieval. This makes it difficult to institutionalize KM as a standard practice. According to the Federal Ministry of Health's Knowledge Management Guidelines (2020–2024), only a few health institutions have structured KM units, resulting in loss of institutional memory and poor continuity in program implementation.

v.   **Weak integration of KM into daily workflows and processes:** Another barrier lies in the weak integration of KM into daily workflows and processes. KM is often treated as a separate initiative rather than being embedded into existing systems and routines. Employees see KM activities such as documentation, archiving, or content curation as additional burdens rather than value-adding processes. This lack of alignment between KM and operational goals leads to low participation and ineffective knowledge systems. Anake and Okeke (2023) note that without user-centered design and integration, KM tools in Nigerian healthcare organizations remained underutilized despite their potential to enhance clinical and administrative performance.

vi.   **Technological and infrastructural limitations** also reinforce cultural and organizational barriers. Even where there is willingness to engage in KM, poor access to reliable digital tools, databases, and communication platforms hampers effective implementation. In many rural or underfunded institutions, there is limited access to internet connectivity, cloud storage, or digital knowledge repositories making it difficult to store and retrieve institutional knowledge systematically (Jimoh & Abdullahi, 2023). These infrastructural gaps further discourage employees from engaging with KM practices, reinforcing the perception that KM is irrelevant or too cumbersome.

vii.   **Inconsistent training and capacity-building efforts**: additionally, inconsistent training and capacity-building efforts prevent organizations from fully leveraging KM. Employees may not be familiar with KM tools such as knowledge repositories, collaborative platforms, or document management systems. Without adequate training and change management processes, organizations fail to build a culture of continuous learning and knowledge sharing. This issue is exacerbated in institutions that do not prioritize professional development or lack KM champions who can guide and mentor staff in adopting best practices (Akhavan et al., 2021).

viii.   **Inaccurate and IncompleteData**: Big data is meaningless unless it is used for improved decision-making. For that, organisations must take necessary actions to manage data such as data acquisition, extraction and recording, data cleansing, data integration and aggregation, as well as data representation and analytics including modelling, analysis and interpretations. Data that will be used to analyse comes from diverse sources and of different formats. It may contain wrong information, duplication and contradictions. It is unlikely that data of extremely inferior quality can bring any useful insights or promising opportunities to organization's precision-demanding business tasks (Saleh, Ismail, Ibrahim, & Hussin, 2018).

ix.   **Data Availability and Accessibility**: This is referring to data being available and accessible much larger and faster in real time and across various industries (Saleh, Ismail, Ibrahim, & Hussin, 2018).This huge amount of data needs to be processed and analysed, and the tasks could be time-consuming as it takes longer time to analyse. In this fast moving world, results of the analysis are demanded almost immediately (Intezari, & Gressel, 2017).

x.   **Technology moves too fast**: Decision making about adopting new technologies can often take a long time or too due to necessary process to be followed including levels of approvals. It can also be confusing to choose big data technologies on the market (Krishnaveni, & Udhayakumar, 2018). Choosing a technology itself can be time consuming

and it evolves to fast making organizations hard to keep abreast with the latest technologies and trends, resulting in poor decision making even from the beginning of choosing a product or solution to help them with actual issues with big data management (Bekker, 2018).

The effective adoption of knowledge management practices in Nigeria is significantly constrained by both cultural factors such as fear of knowledge loss, weak sharing culture, and hierarchical leadership and organisational issues including poor infrastructure, lack of policies, and insufficient training. Overcoming these barriers will require a multi-level approach involving cultural reorientation, strategic leadership commitment, investment in digital infrastructure, and the development of enabling KM policies and incentives. By addressing these challenges, Nigerian organisations can unlock the transformative potential of knowledge as a tool for growth, innovation, and resilience.

CONCLUSION

The intersection of big data and knowledge management presents significant potential for enhancing decision-making, operational efficiency, and innovation in Nigeria. Big data offers an unprecedented volume, velocity, and variety of information that, when effectively harnessed, can improve the capture, sharing, and utilization of knowledge across various sectors. However, Nigeria faces several challenges, including limited infrastructure, data privacy concerns, skill shortages, and inadequate policy frameworks, which hinder the effective integration of big data into knowledge management systems. Despite these constraints, there are growing opportunities for leveraging data-driven insights to transform sectors such as healthcare, agriculture, finance, and education. The success of this integration largely depends on the nation's ability to invest in digital infrastructure, build human capital, and implement supportive policies.

RECOMMENDATIONS

1. **Invest in Digital Infrastructure:** The Nigerian government and private sector should prioritize investments in ICT infrastructure to support large-scale data collection, storage, and processing capabilities necessary for big data applications.
2. **Develop Skilled Workforce:** Institutions of higher learning and training centers should integrate data science and knowledge management into their curricula to produce professionals equipped with the necessary analytical and technical skills.
3. **Establish Regulatory Frameworks:** Clear policies and regulations around data governance, privacy, and ethical use of data should be enacted to foster trust and ensure responsible data handling.
4. **Promote Public-Private Partnerships:** Collaboration between government, academia, and industry stakeholders should be encouraged to drive innovation and facilitate knowledge sharing and application of big data technologies.
5. **Encourage Awareness and Adoption:** National awareness campaigns and stakeholder workshops should be organized to promote the benefits of big data and its role in knowledge management, especially among SMEs and government agencies.
6. **Enhance Data Accessibility:** Creating centralized and open data platforms can facilitate easier access to high-quality data, enabling more effective knowledge creation and utilization across sectors.

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