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Towards an innovative model for knowledge management in public institutions: From knowledge accumulation to smart decision-making

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***Abstract*---**Knowledge management (KM) has emerged as a critical factor in enhancing the efficiency and effectiveness of public institutions. Traditional KM approaches often focus on data accumulation without effectively translating it into actionable insights for decision-making. This paper proposes an innovative model for KM in public institutions that emphasizes the transition from passive knowledge storage to smart decision-making. By integrating emerging technologies such as artificial intelligence (AI), big data analytics, and digital transformation strategies, this model aims to enhance institutional performance and responsiveness. The study reviews existing KM frameworks, identifies challenges in public sector adoption, and presents a strategic roadmap for implementing an innovative KM model that fosters a culture of continuous learning and smart governance.

***Keywords*---**Knowledge Management, Public Institutions, Smart Decision-Making, Digital Transformation, Artificial Intelligence, Big Data, Innovation.

1. Introduction

In the era of rapid digital transformation and increasing complexity in governance, knowledge management (KM) has become a critical factor for the efficiency and effectiveness of public institutions. Traditional bureaucratic

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models, often characterized by rigid structures and fragmented information, are proving inadequate in addressing modern administrative challenges. As a result, there is a growing need for an innovative approach to KM that goes beyond mere knowledge accumulation and facilitates intelligent decision-making.

Public institutions generate and process vast amounts of information daily. However, without a structured mechanism for capturing, sharing, and utilizing this knowledge effectively, much of it remains underutilized. A well-designed KM system can help institutions enhance transparency, improve service delivery, and foster a culture of continuous learning. By integrating emerging technologies such as artificial intelligence, big data analytics, and cloud computing, governments can move towards a smarter decision-making paradigm that is evidence-based and responsive to societal needs.

Moreover, the success of KM in public institutions depends on cultural and organizational factors, including leadership commitment, employee engagement, and interdepartmental collaboration. Overcoming resistance to change and fostering a knowledge-sharing culture are essential steps in building a sustainable KM framework.

This paper explores the need for an innovative KM model in public institutions, emphasizing its role in transforming knowledge from passive storage to a dynamic asset for decision-making. By analyzing current challenges, technological advancements, and strategic implementation methods, this study aims to provide insights into how public institutions can leverage KM to enhance their overall performance and responsiveness.

2. Research Problem

Public institutions face significant challenges in managing and utilizing knowledge effectively due to bureaucratic inefficiencies, fragmented information systems, and resistance to change. Traditional knowledge management approaches often focus on data accumulation rather than its strategic application in decision-making. With the rapid advancement of digital technologies, there is a growing need for an innovative KM model that transforms knowledge into a dynamic tool for smart governance. This study examines how public institutions can shift from passive knowledge storage to intelligent decision-making, addressing the barriers and opportunities in implementing a modern KM framework**.**

Public institutions play a crucial role in governance, policy implementation, and service delivery. However, many institutions face significant challenges in managing knowledge effectively due to bureaucratic inefficiencies, fragmented information systems, and resistance to change (Bučková, 2015; McNabb, 2006). Traditional KM practices in public institutions tend to focus on knowledge accumulation rather than its strategic utilization for decision-making. This paper explores the need for an innovative KM model that leverages emerging technologies to transform knowledge into actionable insights, thereby enhancing institutional efficiency and decision-making processes (Ordóñez de Pablos & Lytras, 2018).

Based on the above, the following main question can be posed:
How can innovative models in knowledge management contribute to improving the performance of public institutions?

3. Methodology of the Study

This study adopts the descriptive and analytical approach as the most appropriate methodology for investigating knowledge management (KM) in public institutions. The descriptive approach is utilized to systematically review existing literature, theories, and models related to KM, providing a comprehensive understanding of its foundations, challenges, and applications. This method enables the study to gather, classify, and interpret relevant data to form a well-structured knowledge base.

The analytical approach is employed to examine and interpret the collected data critically. By analyzing various KM frameworks, technological advancements, and institutional case studies, the study aims to identify key patterns and relationships that influence the transition from knowledge accumulation to smart decision-making. The analytical component also facilitates the evaluation of current KM practices, highlighting gaps and opportunities for innovation.

The choice of this methodology is justified by the study's objectives, which focus on understanding the theoretical underpinnings of KM while also proposing a practical model for its implementation in public institutions. By combining description with in-depth analysis, the study ensures a balanced approach that not only presents existing knowledge but also contributes new insights for enhancing KM efficiency and effectiveness in governance.

4. Literature Review

4.1. Theoretical Foundations of Knowledge Management

KM involves the systematic process of acquiring, organizing, sharing, and utilizing knowledge to achieve organizational goals (McNabb, 2006; Al-Mahruqi et al., 2019). Nonaka and Takeuchi's (1995) SECI model highlights the dynamic interaction between tacit and explicit knowledge, emphasizing the importance of knowledge conversion in organizational learning. Effective KM requires a balance between these two forms of knowledge, ensuring that tacit knowledge is captured and shared efficiently (García-Holgado & García-Peñalvo, 2014).

Knowledge management (KM) plays a critical role in enabling smart decision-making within the public sector. By systematically capturing, organizing, and sharing knowledge, public institutions can enhance their ability to make informed, data-driven decisions. For instance, Alvarenga et al. (2020) highlight how digital transformation and KM initiatives in the public sector improve efficiency and innovation, enabling governments to respond more effectively to citizen needs. Similarly, Chan (2018) demonstrates how Singapore’s Smart Nation initiative leverages KM to integrate data and technology, fostering smarter governance and decision-making. Furthermore, Adobor et al. (2019) emphasize that KM capabilities, such as knowledge acquisition and retention, are essential

for building organizational memory, which supports long-term strategic planning and decision-making in public agencies. By fostering a culture of knowledge sharing and collaboration, as noted by García-Holgado and García-Peñalvo (2014), public institutions can create ecosystems that promote continuous learning and innovation, ultimately leading to smarter, more responsive governance. Thus, KM serves as a foundational pillar for transforming public sector operations and enabling evidence-based, intelligent decision-making.

4.2. Challenges in KM Implementation in Public Institutions

Several studies have identified key challenges in KM adoption within public institutions, including:

- **Bureaucratic Rigidities**: Hierarchical structures hinder knowledge sharing and collaboration (Al-Mahruqi et al., 2019; Keeley, 2004). Bureaucratic rigidities, often characterized by hierarchical and centralized structures, significantly hinder knowledge sharing and collaboration within public sector organizations. These rigid structures create silos where information is compartmentalized, making it difficult for employees across different levels or departments to access and share valuable knowledge. As McNabb (2006) notes, traditional bureaucratic systems prioritize control and compliance over innovation, which stifles the free flow of ideas and expertise. This lack of collaboration limits the organization's ability to leverage collective intelligence, ultimately impairing decision-making processes. For example, Iacuzzi et al. (2020) highlight how rigid hierarchies in public institutions can delay responses to crises, as decision-making is often bottlenecked at the top levels.

  To overcome these challenges, public sector organizations must adopt more flexible and decentralized structures that encourage open communication and cross-functional collaboration. By fostering a culture of knowledge sharing, as emphasized by Nonaka and Takeuchi (1995), public institutions can break down bureaucratic barriers and enhance their capacity for innovation and effective governance.

- **Technological Barriers**: Limited IT infrastructure and interoperability issues impact KM effectiveness (García-Holgado & García-Peñalvo, 2014; Mungai, 2014). Technological barriers, such as limited IT infrastructure and interoperability issues, significantly hinder the effectiveness of knowledge management (KM) in public institutions. Many public sector organizations struggle with outdated or insufficient IT systems, which restrict their ability to store, retrieve, and share knowledge efficiently. As Alvarenga et al. (2020) point out, the lack of robust digital platforms and tools prevents public institutions from fully leveraging data and knowledge for decision-making. Additionally, interoperability issues—where systems and databases cannot communicate seamlessly—further exacerbate the problem, creating fragmented knowledge ecosystems. For example, Janssen et al. (2017) highlight how the absence of standardized data formats and protocols in open government initiatives limits the integration of knowledge across departments. These technological challenges not only slow down processes

but also reduce the quality of decisions, as critical information may be inaccessible or incomplete.

To address these barriers, public institutions must invest in modern IT infrastructure and adopt interoperable systems that facilitate seamless knowledge sharing and collaboration. By doing so, they can enhance their KM capabilities and improve overall organizational performance.

- **Cultural Resistance**: Employees often perceive KM initiatives as additional workload rather than an enabler of efficiency (Bučková, 2015). Cultural resistance is a significant barrier to the successful implementation of knowledge management (KM) initiatives in public institutions. Employees often perceive KM systems as an additional burden rather than a tool to enhance efficiency and productivity. This resistance stems from a lack of understanding of the long-term benefits of KM, as well as the fear of increased workloads associated with documenting and sharing knowledge. As Shujahat et al. (2019) note, when employees view KM processes as time-consuming or irrelevant to their daily tasks, they are less likely to engage with these systems, leading to underutilization. Furthermore, Bučková (2015) highlights that public sector employees, accustomed to traditional workflows, may resist changes that disrupt their routines, even if these changes are designed to improve organizational performance. To overcome this resistance, public institutions must focus on fostering a culture that values knowledge sharing and collaboration.

  This can be achieved through training programs, clear communication of KM benefits, and incentives that encourage active participation. By addressing cultural resistance, organizations can transform KM from a perceived burden into a recognized enabler of efficiency and innovation.

- **Lack of Knowledge Sharing Mechanisms**: Absence of structured knowledge-sharing platforms leads to redundancy and inefficiency (Keeley, 2004; Alvarenga et al., 2020).The absence of structured knowledge-sharing mechanisms is a critical challenge that leads to redundancy and inefficiency in public sector organizations. Without formal platforms or systems to capture, store, and disseminate knowledge, employees often rely on informal methods, such as personal networks or ad-hoc communication, which are neither scalable nor reliable. This lack of structure results in duplicated efforts, as employees may unknowingly work on tasks or projects that have already been addressed elsewhere. As García-Holgado and García-Peñalvo (2014) emphasize, the absence of centralized knowledge repositories or collaborative tools prevents organizations from leveraging their collective expertise, leading to wasted resources and missed opportunities for innovation. Furthermore, Keeley (2004) highlights that the lack of structured KM systems in public institutions often results in the loss of critical institutional knowledge, especially when employees retire or leave the organization.

  To address this issue, public sector organizations must invest in structured knowledge-sharing platforms, such as digital repositories, intranets, or

collaborative tools, that facilitate seamless access to and dissemination of knowledge. By implementing such mechanisms, organizations can reduce redundancy, enhance efficiency, and foster a culture of continuous learning and innovation.

5. The Role of Digital Transformation and AI in KM

Digital transformation and AI-driven analytics have the potential to revolutionize KM by enabling automated data processing, pattern recognition, and predictive analytics (Alvarenga et al., 2020; Iacuzzi et al., 2020). These technologies facilitate real-time knowledge retrieval and decision support systems, ensuring that public institutions operate with greater agility and responsiveness (Ordóñez de Pablos & Lytras, 2018).

Digital transformation and AI-driven analytics hold immense potential to revolutionize knowledge management (KM) in public institutions by enabling automated data processing, advanced pattern recognition, and predictive analytics. These technologies streamline the collection, analysis, and interpretation of vast amounts of data, transforming raw information into actionable insights. For instance, AI-powered tools can identify trends and patterns that might otherwise go unnoticed, enabling public institutions to make data-driven decisions with greater accuracy and foresight. As Alvarenga et al. (2020) highlight, digital transformation enhances KM by facilitating real-time knowledge retrieval, ensuring that decision-makers have access to up-to-date information when needed. Additionally, AI-driven decision support systems can provide predictive insights, allowing public institutions to anticipate challenges and respond proactively. This shift toward intelligent KM systems not only improves operational efficiency but also enhances the agility and responsiveness of public institutions, enabling them to better serve citizens in an increasingly complex and dynamic environment. By embracing these technologies, public sector organizations can unlock new levels of innovation and effectiveness in their KM practices.

6. Expanded Case Studies and Empirical Evidence

A detailed review of case studies highlights successful KM implementations:

- **Portugal's Digital Government Initiative**: Demonstrated the benefits of integrating KM with digital governance strategies (Alvarenga et al., 2020).
- **Kenya Institute for Public Policy Research and Analysis (KIPPRA)**: Showed the challenges of tacit knowledge management and the need for structured KM frameworks (Mungai, 2014).
- **Singapore Smart Nation Initiative**: Illustrates how a data-driven KM approach can transform governance and policy-making (Chan, 2018).
- **United States Open Data Initiative**: Highlights the role of open KM frameworks in enhancing transparency and citizen engagement (Janssen et al., 2012).
- **Italian public universities:** examined the role of performance management systems (PMS) in Italian public universities and their impact on knowledge management. The study found that PMSs, particularly diagnostic and interactive controls, influenced both explicit and tacit

knowledge. Italian universities used PMSs to enhance accountability, transparency, and knowledge sharing among administrative staff (Esposito et al (2013).

- **Malaysian public universities:** Ramachandran, Chong, and Ismail (2009) compared KM practices between public and private higher education institutions (HEIs) in Malaysia. The study found that both public and private HEIs moderately practiced KM processes, with public institutions excelling in knowledge dissemination and creation. The research highlighted the need for formal KM programs to enhance the understanding and implementation of KM processes in HEIs.

7. Proposed Innovative Model for KM in Public Institutions

The proposed model consists of five key components According to the following figure.

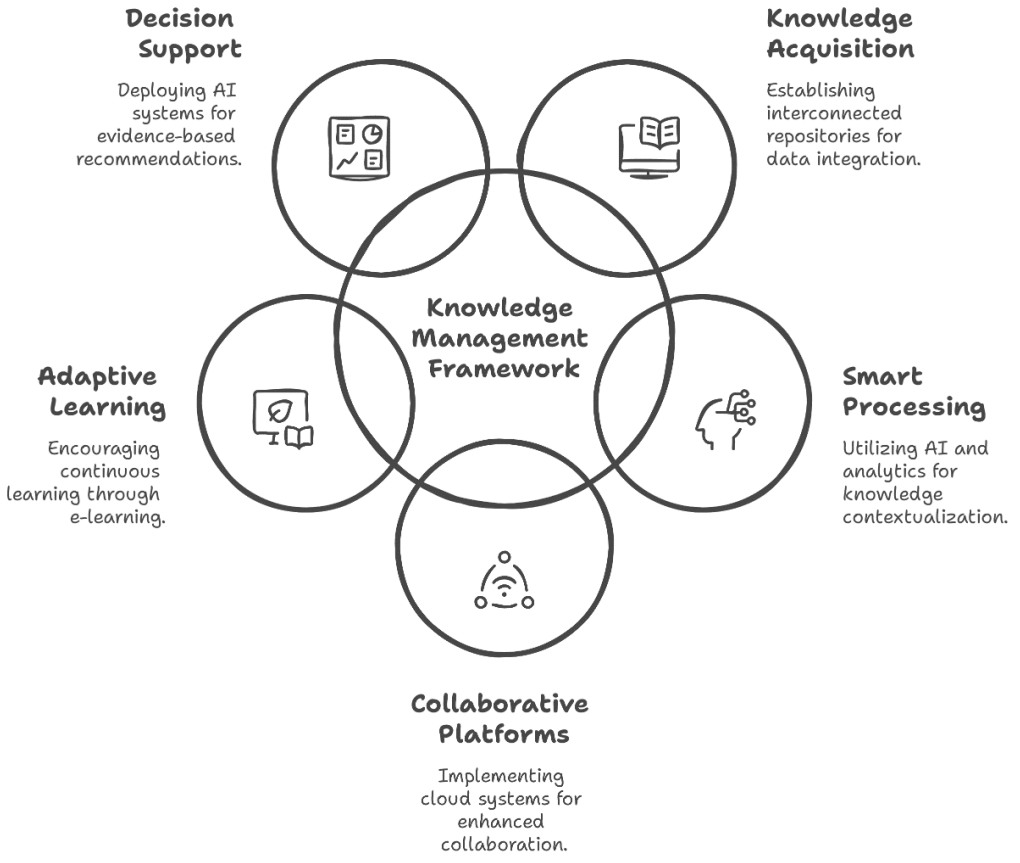

Figure 1: The proposed model for knowledge management in public institutions
Source: Prepared by the researchers

According to the figure, the proposed model consists of the following elements:

- **Knowledge Acquisition and Integration**: Establishing interconnected digital repositories that integrate structured and unstructured data sources

(McNabb, 2006; Keeley, 2004). Knowledge acquisition and integration are critical components of effective knowledge management (KM), particularly when public institutions establish interconnected digital repositories that integrate both structured and unstructured data sources. Structured data, such as databases and spreadsheets, and unstructured data, such as emails, reports, and multimedia files, often exist in silos, making it difficult for organizations to access and utilize their full knowledge base. By creating interconnected digital repositories, public institutions can centralize and harmonize these diverse data sources, enabling seamless access and analysis. As García-Holgado and García-Peñalvo (2014) emphasize, such repositories facilitate the aggregation of knowledge from multiple channels, ensuring that decision-makers have a comprehensive view of available information. This integration not only enhances the efficiency of knowledge retrieval but also supports more informed and holistic decision-making. Furthermore, Alvarenga et al. (2020) highlight that integrating structured and unstructured data through advanced technologies, such as AI and machine learning, can uncover hidden insights and patterns, driving innovation and improving public service delivery. By investing in interconnected digital repositories, public institutions can transform fragmented knowledge ecosystems into cohesive, accessible, and actionable resources.

- **Smart Knowledge Processing**: Utilizing AI and big data analytics to process and contextualize knowledge for decision-making (Ordóñez de Pablos & Lytras, 2018). Smart knowledge processing, powered by AI and big data analytics, is transforming how public sector organizations manage and utilize knowledge for decision-making. These advanced technologies enable the processing of vast amounts of structured and unstructured data, extracting meaningful insights and contextualizing them to support informed decisions. For example, AI-driven tools can analyze patterns in citizen feedback, operational data, and policy outcomes, providing public institutions with actionable intelligence to improve service delivery. As Alvarenga et al. (2020) highlight, big data analytics allows public organizations to identify trends, predict future challenges, and optimize resource allocation, enhancing their ability to respond to citizen needs effectively. Additionally, Ordóñez de Pablos and Lytras (2019) emphasize that AI can automate routine tasks, such as data categorization and knowledge retrieval, freeing up human resources for more strategic activities. By leveraging smart knowledge processing, public institutions can move from reactive to proactive decision-making, ensuring greater agility, efficiency, and responsiveness in addressing complex societal challenges. This shift not only improves operational performance but also strengthens public trust in government institutions.
- **Collaborative Knowledge Sharing Platforms**: Implementing cloud-based KM systems that enhance interdepartmental collaboration and accessibility (García-Holgado & García-Peñalvo, 2014). Collaborative knowledge sharing platforms, particularly cloud-based systems, are revolutionizing how public sector organizations manage and disseminate knowledge. These platforms break down traditional silos by enabling seamless interdepartmental collaboration and ensuring that knowledge is accessible to all stakeholders, regardless of their location or department. Cloud-based KM systems provide

a centralized repository where employees can store, retrieve, and share information in real-time, fostering a culture of transparency and cooperation. As García-Holgado and García-Peñalvo (2014) highlight, such platforms facilitate the integration of diverse knowledge sources, ensuring that decision-makers have access to comprehensive and up-to-date information. Additionally, Alvarenga et al. (2020) emphasize that cloud-based systems enhance scalability and flexibility, allowing public institutions to adapt quickly to changing needs and technological advancements. By implementing collaborative KM platforms, public organizations can improve efficiency, reduce redundancy, and promote innovation, ultimately leading to more effective and citizen-centric governance. These systems also support remote work environments, ensuring continuity and resilience in times of crisis or disruption.

- **Adaptive Learning and Innovation Mechanisms**: Encouraging continuous learning through e-learning platforms and communities of practice (Mungai, 2014). Adaptive learning and innovation mechanisms, such as e-learning platforms and communities of practice, are essential for fostering continuous learning and innovation in the public sector. E-learning platforms provide employees with flexible, on-demand access to training and development resources, enabling them to acquire new skills and stay updated on emerging trends and technologies. These platforms can be tailored to individual learning needs, ensuring that knowledge is effectively transferred and retained. Communities of practice, on the other hand, create spaces for employees to share experiences, solve problems collaboratively, and co-create innovative solutions. As Iacuzzi et al. (2020) highlight, such collaborative environments encourage knowledge exchange and collective problem-solving, which are critical for addressing complex public sector challenges. Furthermore, Nonaka and Takeuchi (1995) emphasize that communities of practice play a vital role in converting tacit knowledge into explicit knowledge, making it accessible to the entire organization. By integrating e-learning platforms and communities of practice, public institutions can cultivate a culture of continuous learning and innovation, empowering employees to adapt to changing demands and contribute to organizational growth. This approach not only enhances individual competencies but also strengthens the overall capacity of public sector organizations to deliver effective and responsive services.
- **Decision Support and Policy Optimization**: Deploying AI-driven decision support systems to provide evidence-based policy recommendations (Iacuzzi et al., 2020). AI-driven decision support systems are transforming how public sector organizations develop and optimize policies by providing evidence-based recommendations grounded in data analysis and predictive modeling. These systems leverage advanced algorithms to process vast amounts of structured and unstructured data, identifying patterns, trends, and correlations that inform policy decisions. For example, AI can analyze citizen feedback, economic indicators, and social data to predict the potential impact of proposed policies, enabling governments to make more informed and proactive choices. As Alvarenga et al. (2020) highlight, such systems enhance the accuracy and efficiency of decision-making by reducing reliance on intuition and guesswork, ensuring that policies are aligned with real-world needs and outcomes. Additionally, Ordóñez de

Pablos and Lytras (2019) emphasize that AI-driven tools can simulate various policy scenarios, allowing decision-makers to evaluate potential risks and benefits before implementation. By deploying these systems, public institutions can optimize resource allocation, improve service delivery, and address complex societal challenges with greater precision. This shift toward data-driven governance not only enhances policy effectiveness but also strengthens public trust in government institutions by demonstrating transparency and accountability in decision-making processes.

8. Implementation Roadmap with Detailed Steps

For public institutions to adopt the proposed KM model, a structured implementation roadmap is essential, The following figure illustrates the stages required to achieve this goal:

Figure 2: Stages of applying the proposed model
Source: Prepared by the researchers

Achieving the successful implementation of the proposed model requires passing through the following interconnected and sequential stages:

- **Assessment and Readiness Evaluation**: Conduct KM maturity assessments to identify institutional readiness (Al-Mahruqi et al., 2019). Conducting Knowledge Management (KM) maturity assessments is essential to determine the readiness of public institutions for KM implementation. These assessments evaluate existing infrastructure, cultural alignment, and technological capabilities to manage knowledge

effectively. By identifying strengths, weaknesses, and gaps, institutions can develop tailored strategies for integrating KM practices, ensuring a smooth transition from knowledge accumulation to smart decision-making. Regular readiness evaluations also help in tracking progress and refining KM strategies over time.

- **Strategic Planning and Policy Alignment**: Align KM initiatives with institutional goals and national digital transformation strategies. Aligning Knowledge Management (KM) initiatives with institutional goals and national digital transformation strategies ensures that KM efforts contribute directly to the broader mission of public sector organizations. This alignment helps prioritize KM projects that support policy objectives, enhance service delivery, and improve operational efficiency. By embedding KM within strategic plans, public institutions can foster a culture of knowledge sharing, innovation, and continuous improvement, while also ensuring that technological investments align with national digital agendas.
- **Technology Deployment and Training**: Invest in AI, big data tools, and cloud-based KM systems while ensuring adequate staff training (Ordóñez de Pablos & Lytras, 2018). Investing in advanced technologies such as AI, big data tools, and cloud-based KM systems is critical for modernizing public sector knowledge management. These technologies facilitate efficient data processing, real-time information access, and seamless knowledge sharing across departments. However, successful deployment requires comprehensive staff training programs to build digital competencies. Equipping employees with the necessary skills ensures effective utilization of KM tools, fosters innovation, and enhances decision-making processes within public institution
- **Knowledge Governance and Security**: Establish policies to regulate data access, cybersecurity, and ethical KM practices (Shujahat et al., 2019). Establishing robust knowledge governance frameworks is essential for regulating data access, ensuring cybersecurity, and promoting ethical KM practices in public institutions. This involves creating policies that define roles, responsibilities, and protocols for managing sensitive information. Implementing strong cybersecurity measures protects institutional knowledge from breaches, while ethical guidelines ensure responsible data usage. Effective knowledge governance not only enhances trust and transparency but also safeguards critical information, enabling secure and efficient knowledge sharing across public sector organizations.
- **Continuous Monitoring and Improvement**: Establish key performance indicators (KPIs) to measure the effectiveness of KM initiatives. Establishing key performance indicators (KPIs) is vital for measuring the effectiveness of Knowledge Management (KM) initiatives in public institutions. KPIs such as knowledge sharing rates, user adoption levels, and operational efficiency improvements provide valuable insights into the success of KM efforts. Regular monitoring and evaluation enable institutions to identify areas for enhancement, ensure alignment with strategic objectives, and foster a culture of continuous improvement. This iterative approach helps public institutions adapt to evolving challenges and optimize their KM systems over time.

9. Conclusion

The transition from knowledge accumulation to smart decision-making in public institutions requires an innovative KM model that integrates emerging technologies and fosters a knowledge-sharing culture. By addressing bureaucratic, technological, and cultural barriers, this model can significantly enhance the efficiency, transparency, and responsiveness of public institutions. Future research should focus on empirical validation of the proposed model through pilot implementations in various government agencies.

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