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# Maximizing the Efficiency of Knowledge Management Systems

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***Abstract*—**The objective of this study was to propose strategies to improve the efficiency of Knowledge Management Systems (KMS). This study highlights best practices from various industries to create an overall summary of Knowledge Management (KM) and efficiency in organizational performance. Results indicated 11 best practices for maximizing the efficiency of organizational KMS that can be divided into four categories: Designing the KMS, identifying case studies, implementing the KMS, and promoting adoption and usage. Our findings can be used as a foundation for scholars to conduct further research on KMS efficiency.

***Keywords*—**Artificial intelligence, knowledge management efficiency, knowledge management systems, organizational performance.

## I. Introduction

BASED on KM principles of sharing, transmitting, distributing, collecting, and documenting knowledge, KMS are platforms that house data, business processes, and visualizations [1]. Although the efficient use of KM practices can increase an organization's performance [12], many organizations use KM and respective systems without guidance or foundation [16]. In addition, only 43% of companies budget for KM practices [12]. Despite literature showing the benefits of implementing KM in organizational programs, further research on KM, specifically regarding best practices, is necessary as technology, culture, and organizations evolve.

Although academia has used and benefited from KM over the past two decades, there has been resistance in commercial sectors, indicating the need for clarity on properly using KMS [12]. More research is necessary to clarify the role of KMS and its proper use. A gap in the reviewed literature indicates the need for an overview of KM best practices as a foundational tool for their proper use in KMS. Without clear KMS best practices, organizations might not receive optimal benefits, which could adversely impact organizational performance. Therefore, we believe this research is necessary and will help fill the void of KMS best practices. Although 57% of companies still need to provide a budget for KM activities, companies that do budget for KMS are currently not maximizing the value of their investment [12]. Reference [15] noted that more than 70% of companies will increase productivity by at least 20% when using KM. Research has shown the significance of KM in companies, including the effective use of KMS in customer support organizations, yet there is a gap in identifying best practices [19]. Reference [17] recommended future research to identify the differences between a KMS strategy with and without AI.

This paper will answer the following questions:

- High-level question: What are the best practices for maximizing KMS?
- Q1: How can organizations maximize KMS efficiency using AI?
- Q2: How can organizations integrate AI into a standing KMS?
- Q3: What are the future expectations for AI regarding KM?

## II. Literature Review

### *A. The Lack of Understanding or Awareness of the Benefits of KM*

Some employees might need help understanding how a KMS can help them or the organization, leading to low adoption and usage. Resistance could be due to lacking KMS understanding or inconvenience [8]. Reference [11] found a link between ignorance and critical failure factors that impact knowledge sharing. Minimal evidence showing the relationship between KM and business performance could cause hesitation and suspicion, leading to KMS under usage [12].

### *B. Complex or Difficult-to-Use Technology*

Information technology is fundamental to and assists with all aspects of KM [1]. Employees might be less likely to use a KMS that is difficult to navigate or use. With the growth of the internet, the proliferation of network-capable computing devices, and the vast quantity of data being stored in digital formats, the need for professionals capable of securing communication channels and information storage become a critical task for government entities, businesses, and individuals [6].

### *C. Limited Incentives for Participation*

Employees must have proper incentives to see the value in contributing to the KMS. Individuals could resist knowledge sharing or reporting due to their lack of KMS understanding, the inconvenience and time it takes, or a lack of desire to use it [8]. Companies face different challenges, and several factors could be at play. A comprehensive analysis of a company's specific context is necessary to understand why it is not maximizing its KMS use. In Table I, we discuss the general best

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practices of KMS, grouped by category.

*D. Maximizing the Efficiency of KMS*

A well-designed and implemented KMS can benefit an organization significantly, such as improved efficiency, increased innovation, and enhanced decision-making. However, many companies need help to realize their KMS's potential fully. This section presents guidance on how companies can maximize the efficiency of their KMS. One of the most significant elements in implementing a KM process is the organizational structure, which includes roles, responsibilities, policies, and procedures [1]. Leaders and knowledge managers must understand the organizational context in which a KMS will be implemented, including the hierarchy of positions and offices, goals and objectives, and current processes and systems. Knowledge managers could identify specific areas where a KMS would provide the most value, such as areas of high employee turnover and where there is a lack of expertise or inefficiencies in the organization's culture. The organizational culture comprises the behaviors, assumptions, and beliefs that shape its members' behavior [26].

*E. Designing the KMS*

KMS can be designed and customized to fit any organization. Generally, a KMS comprises four systems: knowledge application, capture, sharing, and knowledge [20]. In a literature review, [1] examined how the KM infrastructure provides a long-term foundation to support a KMS. Designing a KMS is a process to determine what types of knowledge the organization will capture and manage and how it will share that knowledge. Some companies might use a centralized database to store and share knowledge, whereas others could use a more decentralized approach, such as communities of practice or peer-to-peer networks. A critical aspect of designing the KMS is ensuring it is easy to use and navigate. The system should be intuitive and user-friendly, with a clear interface that makes the content searchable. Additionally, the system should be flexible, adaptable, and easily updated and expanded as the organization's needs change. Recommended steps for designing a KMS include:

- Provide a weekly or monthly KM forum series for your organization to better educate everyone in KM and create further awareness.
- Select a targeted business area and conduct a knowledge audit to see the types of knowledge needed for that area, the available and missing knowledge, who has the knowledge, and how that knowledge is being used.
- Attend KM seminars or conferences, many of which are industry-focused.
- Bring in - KM "advisors" who could help shape a KM strategy for the organization.
- "Start developing some best practices/lessons learned/ yellow pages of expertise for your organization" [14].

*F. Promoting Adoption and Usage*

Promoting the adoption and use of the KMS is crucial for success. Organizations should encourage employees to share their knowledge and expertise and provide incentives for using the system. A KM incentive design or gamification could increase employee motivation [8]. For example, organizations could recognize and reward employees who contribute to the KMS or provide bonuses for those who actively use it.

It is also essential to foster a knowledge-sharing culture within the organization, promoting a sense of community and collaboration among employees and encouraging open communication and idea-sharing. Company leaders should regularly communicate the value of the KMS to employees and demonstrate how it can help in their work. Increasing knowledge-sharing creates a reciprocal dynamic as the KM process directly affects intellectual capital [1].

User training can help an organization adopt new systems by providing employees with the necessary skills and knowledge to use the new system effectively. User training can also increase employees' confidence in using the new system and help minimize resistance to change. Reference [23] analyzed a technology acceptance model, finding that user acceptance and confidence were critical to new technology adoption.

*G. Maximize the Efficiency of KM Using AI*

The history of AI with knowledge-based systems dates to the 1990s and 2000s. The main emphasis of AI research has been to develop knowledge-based systems, computer programs that employ knowledge and reasoning to facilitate problem-solving and decision-making through data mining [13]. AI, computer science, machine learning, database administration, data visualization, mathematical methods, and statistics comprise the interdisciplinary data mining topic [13]. These systems enable storing, organizing, and retrieving knowledge from various sources, such as documents, databases, and the internet, and making it available to users.

The study of AI integrating with KM adds to the academic body of knowledge in several ways:

- Improved understanding of using AI to improve the efficiency of KMS: By understanding how AI can automate repetitive tasks, provide more accurate and relevant information, and support decision-making processes, researchers can develop more effective KMS and improve how organizations manage knowledge.
- Advancement of AI techniques for KM. By studying ways to use AI in KMSs, researchers can develop new AI techniques and algorithms applicable to other domains, including natural language processing and machine learning.
- Better insight into the ethical and societal implications of using AI in KMS. As AI becomes more integrated into KMS, it is important to understand ethical and societal implications, such as privacy, transparency, and bias.
- Advancement of KM theory. By understanding how AI could support knowledge creation, sharing, and retention, researchers can contribute to developing KM theory and improve the understanding of how organizations can manage their knowledge effectively.
- Improved ability to address practical challenges. Research on AI integration into KMS could help organizations address practical data management, security, governance,

and scalability challenges.

Recently, AI researchers have shifted their KM focus to developing natural language processing and machine learning techniques to analyze and understand unstructured data, such as text and voice [4]. The techniques are useful for extracting knowledge from unstructured data, such as documents, emails, and social media, and making it available to users. As a result, employees can find the information they need more quickly without spending hours searching through vast amounts of data.

As AI techniques have advanced, they have become increasingly integrated into KMS. Organizations that use contemporary business intelligence and analytics systems with enhanced data discovery skills will grow twice as quickly and produce twice as much business value [5]. In addition, organizations will increasingly depend on the automated data-analysis tools offered by robust business intelligence systems that enable AI and machine learning [18]. Reference [2] found that business intelligence–powered AI positively correlates with customer and user knowledge creation and external market knowledge.

Organizations can use AI to support KM activities such as search, recommendation, and categorization. In the 1990s, corporations employed people solely to categorize, search, and distribute knowledge [24]. The rise of computers led to extensive research on information categorization systems, and today, "AI can automate knowledge-intense tasks" [9, p.4].

Although typical KM projects include generating, transferring, storing, and evaluating a firm's knowledge throughout the knowledge lifecycle, the projects frequently exclude continuous advancements in AI [9]. Integrating AI into a standing KMS can benefit organizations by making their KMS more intelligent and efficient; however, integration can be complex and requires careful planning and execution. As a result, organizations struggle to integrate AI into working environments to leverage outcome efficiency [9]. In this section, we discuss best practices for integrating AI into a KMS, thus maximizing the KMS's efficiency.

### *H.Identify and Study: Case Studies*

Case studies provide real-life examples of how organizations have applied a product, service, or strategy and achieved results. Researchers could use case studies as practical examples of AI implementation in real-world scenarios, showcasing best practices and challenges. Case studies could offer insights into the benefits and limitations of AI regarding KM, allowing organizations to avoid common pitfalls and make informed decisions about implementation. For brevity, we analyze one case where a company used an AI-powered KMS for customer service.

In 2021, HSBC received many calls from different time zones that they could not effectively manage [25]. In addition, customers received different answers to the same questions based on who answered the phone. To meet its goal of "answer[ing] questions faster and…improv[ing] the overall consistency and quality of policy response" [25, p.1]; the bank implemented an AI-powered KMS to streamline the process of answering customer queries. The system uses machine learning algorithms to analyze customer inquiries, extract relevant information from various sources, and provide accurate answers in real-time.

We looked at Trust Pilot reviews of HSBC's AI-powered KMS. Of the 184 reviews in the last 12 months, 162 were one-star reviews. A few comments about HSBC's customer service chatbot comments were:

> "After 90 minutes in 2 days, I am still yet to speak to an actual person. More than an hour to answer a chat…its really not good enough. There should be a regulated requirement for a vaguely acceptable level of service…its just not acceptable." (October 29, 2022)
>
> "What poor customer service you get when using the app to talk with an agent. The response times to each question takes at least 19 minutes. It took 45 minutes to close two accounts. I did try using tele-phone banking to speak with an agent but to no avail, just stuck in a queue. What's happening to HSBC." (October 16, 2022)
>
> "Are there any real human beings working as CS agents at HSBC? When I try to chat with a real agent online, I get a bot. When I ask that bot to connect me to a real agent, I then get an online msg which says give HSBC a call. When I try to call, I'm kept on hold for hours, and eventually give up due to frustration. HSBC CS used to be good but today it is failing customers miserably. If this continues, customers will be voting with their feet and signing up with other banks. Customers, who prop up their business, really do need to be treated much better than this." (October 4, 2022)
>
> "If I could have given 0 stars I would have, over 1 month I've been with this bank and they've still not got me access to my account, I can use my card (thankfully) but can't do or see anything else, their online chat is useless as you have to log in to actually speak to anyone and if you don't have access like I don't then it's game over, the chat cancels and kicks you out. As soon as I manage to speak to anyone, I will be closing my account!" (August 4, 2022)

Despite the negative feedback, we cannot determine if HSBC's AI-powered KMS is effective based on these reviews. Customers' negative reviews could stem from the inability to articulate their problem or the AI system failing to meet customer needs properly.

In an interview, Andy Kingston, head of UK Customer Service Strategy and Transformation at HSBC, discussed the conversational use of AI. One of Kingston's suggestions: "If your on-demand banking goes wrong, there can be some pretty big ramifications. So having the humans sat alongside that technology is, I think, absolutely vital in financial services" [7, p.1]. Kingston also recommended,

> Only automate simple processes if you can improve the experience—for example, customers probably already know how to pay their credit card bills. A chatbot will not improve the experience unless you add value—perhaps give them the information they cannot find themselves, such as insights into great personal financial management [22, p.1].

## III. Method

A literature review provided the data for this qualitative, descriptive study. We adopted a qualitative–constructivist research paradigm. Owing to multiple approaches by organizational leaders implementing KMS, it was necessary to evaluate sufficient samples before concluding that any was a best practice. The literature search included several databases, newspapers, and corporate websites. While considering the authors' opinions, we also evaluated expert opinions recently published in newspapers or online as part of the study sample. The use of quality evidence was necessary for the recommendation of a best practice. This literature review presents best practices from various industries to create an overall summary of KM and efficiency in organizational performance.

Gathering relevant literature for the review entailed conducting a comprehensive search using Google Scholar. The search terms used were KMS, efficiency, and maximizing. Except for historical articles about the foundation of KM and its integration with AI, the search results included articles published after 2018. After identifying the relevant literature, we extracted data from each article, including the authors, publication year, study design, sample size, and main findings. Next, we organized this information in a spreadsheet for easy reference and analysis. Assessing the literature with the Newcastle-Ottawa Scale ensured the inclusion of only high-quality studies. Analyzing the extracted data to identify common themes and patterns in the literature involved reading and rereading the articles, taking notes, and grouping similar findings.

As with any research, this literature review had several limitations. The search was limited to English articles, excluding any relevant studies published in other languages. Also, we limited the search to articles published after 2018, so some important older studies could have been omitted from the review. Finally, in this era of digitization, the lack of AI and KM tools adoption creates significant research obstacles.

## IV. Results

### A. High-Level Question: What Are the Best Practices for Maximizing Knowledge Management Systems?

Our review identified 11 best practices for maximizing KMS, as categorized in Table I.

### B. Q1: How Can Organizations Maximize KMS Efficiency Using AI?

A key way that AI can maximize the efficiency of a KMS is through natural language processing techniques. Organizations can use natural language processing algorithms to automatically extract key information from unstructured data, such as text documents, emails, and social media posts, and make it more easily searchable and accessible.

Another way to use AI to maximize KMS efficiency is through machine learning algorithms, which analyze patterns in the data stored in a KMS and predict what information employees will need in the future [21]. With these algorithms, organizations can make information more easily accessible and visible to employees.

TABLE I
Best Practices for Maximizing KMS

| Best practice | Category | Reference |
|---|---|---|
| i. Focus on Knowledge Management infrastructure. | Designing the KMS | [1] |
| ii. Break the KMS down into 4 subcomponents. | Designing the KMS | [20] |
| iii. Have humans monitor and AI chat bots, especially in financial services. | Identify Case Studies (AI) | [7] |
| iv. Only automate simple processes if you can improve the experience. | Identify Case Studies (AI) | [22] |
| v. Focusing on the quality, competitiveness, and effectiveness of an organization. | Implementing the KMS | [10] |
| vi. Implement a KMS with the aid of Information and Communications Technology in order to improve the knowledge documentation, dissemination, adoption, development and creation. | Implementing the KMS | [20] |
| vii. Increase knowledge sharing to create a reciprocal dynamic; there is a direct effect of the Knowledge Management process on intellectual capital. | Promoting adoption and usage | [1] |
| viii. Incentive design and reward is a feasible approach to increase employee motivation. | Promoting adoption and usage | [8] |
| ix. User acceptance and confidence are important to new technology adoption and can be accomplished by user training. | Promoting adoption and usage | [23] |
| x. Focus on organizational structure. | Understanding the organizational context | [1] |
| xi. Focus on organizational culture. | Understanding the organizational context | [26] |

### C. Q2: How Can Organizations Integrate AI into a Standing KMS?

The literature showed that conducting a case study is the best way to integrate AI into a standing KMS. Reference [17] stated, "Learning from errors across different companies and industries can minimize similar errors in an organization" (p.12). Due to the multiple factors and the high complexity of integrating KMS with AI, we suggest that organizations conduct their own case studies.

### D. Q3: What Are the Future Expectations for AI Regarding KM?

In future AI and KM combinations, we can expect scholars to understand how organizations use AI to support knowledge creation and sharing. A deeper understanding would come from research to identify experts, facilitate collaborations, and determine AI can create new knowledge through data and text mining.

## V. Conclusion

A well-designed and implemented KMS can provide significant benefits to an organization, including improvements to efficiency, innovation, and decision-making. However, many companies need help to realize their KMS potential fully. Business leaders who understand the organizational context, design the KMS to meet unique needs, promote its adoption and

use, and identify the correct case studies will maximize KMS efficiency.

Recent research has shown how AI can significantly improve KMS efficiency by automating repetitive tasks, providing more accurate and relevant information, and supporting decision-making processes. Further research on integrating AI with KM is essential to understand how organizations can use AI to improve the efficiency of KMS and support their KM efforts. Additional research would contribute to advancing AI techniques and understanding its ethical and societal implications, which is paramount as AI becomes more prevalent throughout many aspects of individuals' lives. One suggestion for further research is to examine how ChatGPT; a generative AI tool [3]; could help organizations collect data for KM.

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