

Knowledge Management Strategy to Support Remote Work (Work from Anywhere) at PT. Bukit Makmur Mandiri Utama

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Abstract

This study examines the implementation of Knowledge Management (KM) strategies to support the Work From Anywhere (WFA) model at PT BUMA, a leading mining contractor in Indonesia. The research identifies the need to manage tacit knowledge (practical experiences from senior employees, problem-solving techniques, field-based intuition, and hybrid knowledge retreats) and explicit knowledge (documented procedures, operational guidelines, real-time monitoring data, digital repositories, blockchain for knowledge security, and crowdsourcing initiatives) to effectively support remote work. These findings were derived through thematic analysis of interviews with key stakeholders, highlighting the importance of both tacit and explicit knowledge for maintaining operational continuity and efficiency in WFA settings. Using SWOT analysis, the study highlights strengths such as documented procedures and cloud-based platforms, weaknesses in sharing tacit knowledge, opportunities for cross-division collaboration, and threats related to data security. Proposed strategies include virtual mentoring programs, integration of cloud and blockchain technology, and enhanced digital documentation practices. The findings provide actionable KM strategies to improve operational efficiency, knowledge accessibility, and employee engagement, supporting WFA in the mining sector. This research offers practical insights and innovative solutions for managing knowledge effectively in industries with complex operational demands.

Keywords: Knowledge Management, Work From Anywhere, Tacit Knowledge, Explicit Knowledge, Mining Industry, SWOT Analysis.

1. Introduction

The global shift in work dynamics, accelerated by the COVID-19 pandemic, has brought significant transformations to organizational operations, including the widespread adoption of remote work practices [1]. Among these, the Work from Anywhere (WFA) model has emerged as a solution for offering flexibility to employees, allowing them to work without geographical constraints [2]. While this model provides numerous benefits, such as operational efficiency and flexibility in time management, it also introduces new challenges, particularly in managing organizational knowledge effectively [3]. Effective knowledge management (KM) is critical to ensure seamless collaboration, productivity, and the transfer of essential knowledge in a distributed workforce.

In the mining contractor services sector, adapting to remote work presents unique challenges and opportunities. Unlike other industries, mining operations rely heavily on field-based activities, the use of heavy machinery, and constant coordination among geographically dispersed teams [4]. These characteristics make KM indispensable for maintaining smooth operations, optimizing resource utilization, and ensuring productivity. KM strategies in this context are particularly relevant for managing operational knowledge, facilitating on-the-job training, enforcing safety protocols, and bridging collaboration gaps between remote and on-site workers [5].

Digital tools, cloud-based platforms, and virtual communication methods have emerged as key enablers for KM, enabling companies to maintain operational continuity despite physical distance [6]. However, the transition to remote work in the mining industry introduces challenges, including resistance to adopting digital platforms, managing data security, and maintaining team engagement [7]. Addressing these challenges and overcoming barriers to effective KM is critical for ensuring that remote work models like WFA are not only sustainable but also contribute to operational efficiency and employee well-being.

PT. Bukit Makmur Mandiri Utama (BUMA), one of Indonesia's leading mining contractors, faces unique challenges in implementing KM strategies to support WFA. The mining industry's complexity, which includes a high reliance on tacit and explicit knowledge transfer, requires an integrated approach for effective KM. This involves adopting digital technology, fostering a supportive organizational culture, and ensuring robust information technology infrastructure [5] & [6]. However, research on implementing KM specifically in the mining sector within the context of WFA is still limited, particularly in Indonesia.

Previous studies have extensively discussed KM implementation in manufacturing and technology sectors, but little attention has been given to the mining sector, especially in relation to WFA. Key challenges include the lack of integrated IT systems to facilitate remote collaboration and resistance within organizational culture to adapt to change. Zhang and Patel (2022) found that digital integration significantly improves KM effectiveness in distributed work environments, though its success depends heavily on organizational readiness, including infrastructure and culture.

In BUMA's case, ensuring that operational and technical knowledge is accessible to employees working from various locations remains a pressing challenge. Furthermore, varying levels of digital adoption among employees hinder the effective use of technology as a KM mediator. These issues underscore the gap between the need for KM strategies that support WFA and the availability of actionable, tailored strategies to address this need. This study aims to address the following research questions:

- (a) What types of knowledge must be managed in the knowledge management (KM) strategy for Work From Anywhere (WFA) at BUMA?
- (b) What are the recommendations for effective strategies for managing knowledge (KM) to support the Work From Anywhere (WFA) model at BUMA?

By using the SWOT framework, this study systematically analyzes BUMA's KM practices, evaluating the internal capabilities and external challenges that influence the effectiveness of WFA. The first research question focuses on identifying critical types of knowledge—such as operational, technical, and tacit knowledge—that are essential for BUMA's mining operations and must be managed effectively in a remote work setting. The second research question aims to propose actionable KM strategies tailored to BUMA's needs, addressing challenges such as resistance to digital adoption and infrastructure limitations while leveraging opportunities from digital transformation trends.

The novelty of this research lies in its use of the SWOT framework to systematically identify and address key internal and external factors affecting KM in BUMA. By focusing on internal strengths, such as existing technical expertise, and external opportunities, such as advancements in digital technology, this study offers a structured approach to enhancing KM practices in support of WFA. The findings aim to provide practical recommendations for BUMA to improve KM implementation and contribute to a broader theoretical understanding of KM strategies in the mining sector during the era of digital transformation and remote work.

Using a case study methodology that incorporates interviews, observations, and document analysis, this research provides actionable insights and strategies for BUMA to



address its unique KM challenges in a WFA environment. Additionally, it seeks to advance the theoretical understanding of KM practices in industries with complex operational demands, such as mining.

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2. Literature Review

When This chapter provides an overview of the key concepts and research areas relevant to this study, including knowledge management, knowledge management strategies, the coal mining industry and the Work from Anywhere (WFA) model. The purpose of this review is to establish a theoretical foundation for understanding how knowledge management (KM) strategies can support remote work, particularly in the context of coal mining contractor services.

2.1. Knowledge Management

Knowledge Management (KM) is a systematic process for capturing, organizing, sharing, and utilizing knowledge within an organization to achieve better performance and competitive advantage [9]. KM involves both tacit knowledge, which is experience-based and difficult to articulate, and explicit knowledge, which can be easily documented and shared [10]. The effective implementation of KM practices allows organizations to leverage their intellectual assets, ensuring that knowledge is accessible and usable across the workforce [11]. In the context of remote work, KM plays a critical role in enabling communication, collaboration, and information sharing among geographically dispersed employees [12]. The mining contractor services sector, with its complex operations and field-based activities, can benefit significantly from well-structured KM practices to ensure seamless information flow and operational continuity.

2.2. Coal Mining

The coal mining industry is a critical sector that provides energy resources and supports various industrial activities globally [17]. It involves extracting coal from underground or surface mines, often using heavy machinery and requiring extensive coordination among teams [18]. The industry is characterized by challenging working conditions, including remote and often hazardous locations, which makes communication and knowledge sharing among teams essential [19]. Traditionally, the coal mining industry has been heavily reliant on on-site operations; however, recent technological advancements have enabled a gradual shift towards digitalization and remote management of operations [20]. The adoption of digital tools and KM practices in this sector can support more efficient operations, improve safety standards, and enhance the ability to adapt to changing market and regulatory environments [21].

2.3. Work From Anywhere

Work from Anywhere (WFA) is a flexible work arrangement that allows employees to perform their tasks from any location, as long as they have access to the necessary technological tools and a stable internet connection [22]. The WFA model gained significant popularity during the COVID-19 pandemic, as companies sought ways to maintain business continuity while adhering to social distancing measures [23]. WFA offers benefits such as improved work-life balance, reduced commuting time, and access to a broader talent pool [24]. However, it also introduces challenges such as managing employee engagement, maintaining productivity, and ensuring effective knowledge sharing across dispersed teams [25]. For industries like coal mining, which traditionally rely on physical presence, implementing WFA requires careful adaptation of digital tools and KM strategies to maintain operational standards and communication [26]. The WFA model's success in the mining sector depends heavily on leveraging KM practices to bridge the gap between field-based and remote operations [27].

2.4. SWOT Analysis

SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is a strategic framework used to assess internal and external factors that influence organizational performance. In the context of Knowledge Management (KM), SWOT analysis helps identify key areas for improvement and development, ensuring effective implementation of KM practices [28].

- (a) Strengths in KM often include well-documented procedures, advanced digital tools, and a culture of knowledge sharing. These factors enhance the accessibility and usability of knowledge across an organization.
- (b) Weaknesses typically involve challenges in sharing tacit knowledge, lack of employee digital literacy, and limitations in infrastructure, particularly in remote or field-based industries like mining.
- (c) Opportunities for KM include advancements in digital technologies, such as cloud platforms and virtual collaboration tools, which can improve knowledge flow and operational efficiency.
- (d) Threats often stem from data security risks, loss of undocumented tacit knowledge, and resistance to adopting new digital systems.

By applying SWOT analysis to KM, organizations can leverage their strengths and opportunities while addressing weaknesses and mitigating threats. This approach provides a structured foundation for designing KM strategies that align with organizational goals and support remote work models like Work From Anywhere (WFA). For the coal mining sector, integrating SWOT analysis into KM practices can bridge the gap between field-based and remote operations, ensuring both efficiency and adaptability.

3. Methodology

/This study employs a systematic methodology to explore the factors influencing the implementation of knowledge management (KM) strategies in supporting the Work From Anywhere (WFA) model at PT. Bukit Makmur Mandiri Utama (BUMA), one of Indonesia's leading mining contractors. The research adopts a structured approach based on the Input-Process-Output (IPO) framework to ensure that each stage of the investigation is clearly defined and aligned with the study's objectives.

To achieve these objectives, the research integrates qualitative and case study methods. Data collection involves interviews with key stakeholders, including managers and employees, as well as the analysis of internal documents such as Standard Operating Procedures (SOPs). The study is guided by the SWOT framework (Strengths, Weaknesses, Opportunities, and Threats), which provides a comprehensive tool to evaluate the internal and external factors affecting KM implementation in a remote work context [28].

Each step of the methodology is carefully structured to identify the challenges and opportunities associated with KM implementation in a remote work environment. The results from this study aim to provide actionable recommendations for BUMA and contribute to the broader understanding of KM strategies in the mining sector, particularly during the era of digital transformation and remote work.

3.1. Input-Proses-Output Framework

a. Input

This study collects data from various primary and secondary sources relevant to the implementation of Knowledge Management (KM) at PT Bukit Makmur Mandiri Utama (BUMA). Primary data were obtained through in-depth interviews with key stakeholders, including managers and critical staff members, to explore experiences and challenges in applying KM to support the Work From Anywhere (WFA) model. Secondary data include internal company documents, such as standard operating procedures and reports related to



digital technology implementation. Additionally, a literature review was conducted to strengthen the theoretical framework concerning KM, remote work, and best practices in the mining sector.

b. Process

The research process involves several key stages aimed at identifying critical knowledge types and factors influencing KM implementation in the WFA environment. First, content analysis of interview transcripts was conducted to extract themes related to operational, technical, and tacit knowledge needs. Subsequently, a SWOT analysis was used to assess internal strengths and weaknesses, as well as external opportunities and threats affecting KM, including technological advancements and cybersecurity risks. The next stage involved a case study analysis to map knowledge types and their transformation processes utilizing digital tools. The role of technology was validated through data triangulation from interviews and company documents. Finally, KM strategies were developed and validated using triangulated data from interviews, focus group discussions (FGDs) with management and employees, and SWOT mapping to ensure the proposed strategies effectively address both internal and external challenges.

c. Output

The study results include the identification of knowledge types critical to PT BUMA's operations, encompassing tacit, explicit, technical, and operational knowledge. Furthermore, a comprehensive analysis of factors influencing KM implementation within the Work From Anywhere model is presented based on SWOT analysis findings. These results provide a strong foundation for designing effective KM strategies aimed at improving knowledge management efficiency and supporting seamless operations in geographically distributed work environments.

3.2. Research Design

The diagram represents the systematic research process undertaken to explore the implementation of Knowledge Management (KM) strategies to support the Work From Anywhere (WFA) model at PT BUMA.

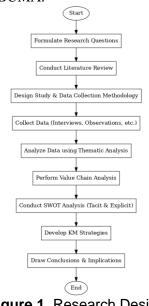


Figure 1. Research Design

It illustrates the progression from defining research questions and conducting a literature review to collecting and analyzing data. The methodology integrates thematic



analysis, value chain analysis, and SWOT analysis to identify and address key knowledge management challenges and opportunities. This comprehensive approach ensures the development of actionable KM strategies tailored to BUMA's operational context, with a focus on addressing tacit and explicit knowledge needs. The diagram concludes with the derivation of conclusions and implications, highlighting the practical and theoretical contributions of the research.

3.3. Data Collection

At this stage, semi-structured interviews were conducted to collect data from respondents. The respondents required for this research were individuals with strategic roles at PT BUMA, related to Knowledge Management (KM) and the implementation of the Work From Anywhere (WFA) model. Creswell (2015) states that the number of respondents in a study is determined by data saturation, which is the condition where the data collected sufficiently meets the research needs, making it unnecessary to add more respondents. In this study, the interviews involved three respondents: the Head of IT, Head of Safety and Health Environment, and Senior Staff IT Risk Management.

The semi-structured interviews were conducted onsite at PT BUMA's office, with each session lasting between 30 to 60 minutes. The interview sessions were recorded using audio recording devices with the consent of all respondents. The researcher also ensured the privacy and anonymity of the respondents, adhering to research ethics guidelines.

3.4. Data Analysist

In analyzing the effectiveness of knowledge management (KM) strategies at PT BUMA to support the Work From Anywhere (WFA) model, a SWOT analysis was conducted to identify the internal and external factors influencing the organization. This analysis aims to provide a comprehensive understanding of BUMA's strengths, weaknesses, opportunities, and threats in managing knowledge within a remote work context.

The Strengths and Weaknesses represent the internal factors that influence the effectiveness of KM implementation, such as the availability of documented procedures and challenges in sharing tacit knowledge. Meanwhile, the Opportunities and Threats highlight external factors, such as the potential for enhancing cross-division collaboration through digital tools and the risks associated with data security and the loss of undocumented tacit knowledge.

By mapping these factors, strategies were developed using the SWOT matrix to optimize BUMA's strengths and opportunities while addressing its weaknesses and mitigating threats. These strategies are designed to align with the research objectives, offering actionable insights to improve KM practices in support of WFA [28]. The following sections elaborate on the findings from the SWOT analysis and their relevance to the study's research questions.

4. Result and Discussion

4.1. Value Chain Analysist

One of the primary approaches used is Value Chain Analysis, which aims to map the core and supporting activities within the organization that play a crucial role in value creation and knowledge management.

Value Chain Analysis was chosen for its ability to identify critical types of knowledge at each stage of the value chain, both in main operational processes and supporting functions. This approach is relevant for understanding the relationship between knowledge transfer, operational effectiveness, and technology implementation in a remote work environment like WFA. Through this analysis, the study seeks to explain how technical, operational, and managerial knowledge elements can be optimized to support organizational efficiency.

The analysis process involves integrating interview data from management and employees, as well as evaluating internal documents such as SOPs related to KM practices. The results of the Value Chain Analysis not only provide insights into the challenges and opportunities in knowledge management at BUMA but also serve as a foundation for recommendations to effectively implement WFA.

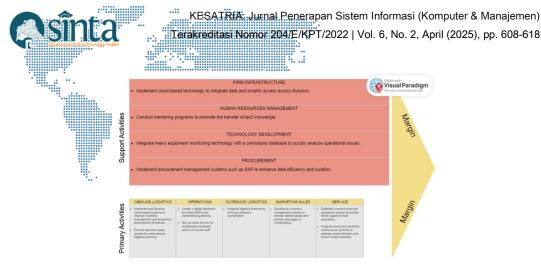


Figure 2. Value Chain Analysis

4.2. Types of Knowledge Must be Managed in The Knowledge Management (KM) Strategy for Work From Anywhere (WFA) at BUMA

The process began with conducting semi-structured interviews with key stakeholders, including the Head of IT, Head of Safety and Health Environment, and Senior Staff IT Risk Management, to identify tacit knowledge (such as practical experience, field-based intuition, and problem-solving techniques) and explicit knowledge (such as documented procedures, technical guidelines, and digital data). The interview results were transcribed and analyzed using thematic analysis to group codes into major themes, which were then linked to primary and supporting activities in the Value Chain Analysis. Primary activities, such as mining operations and safety protocols, and supporting activities, such as training and IT management, were connected to the relevant types of knowledge to ensure operational sustainability in the context of WFA. The integration of thematic analysis and value chain produced a comprehensive understanding of BUMA's knowledge management needs:

- 1) Tacit Knowledge
- (a) Practical Experiences from Senior Employees

This knowledge is vital for mentoring junior employees, identifying risks, and improving efficiency in both technical and operational contexts.

- (b) Problem Solving Techniques Sharing these experiences through virtual mentoring programs or recorded sessions can help preserve and transfer this knowledge to remote teams.
- (c) Field Based Intuition Intuitively identifying potential safety hazards or understanding unique equipment behavior in the field is critical for operational safety and efficiency.
- (d) Hybrid Knowledge Retreats
 Organize periodic hybrid retreats where employees work both onsite and remotely. During these retreats, teams can co-create knowledge artifacts (e.g., guides, technical documents) while also conducting live simulations and collaborative sessions.
- 2) Explicit Knowledge
- (a) Documented Procedures and Protocols

These documents must be centralized on a cloud platform to ensure easy access for remote employees.

- (b) Operational and Technical Guidelines Standard operating procedures (SOPs) for equipment usage, safety measures, and IT risk management must be readily accessible and regularly updated.
- (c) Real-Time Monitoring Data Integration of monitoring systems with cloud platforms ensures availability and reliability of data for remote decision-making.
- (d) Digital Knowledge Repositories
 Centralized digital repositories that house reports, risk assessments, and environmental monitoring data are crucial for cross-functional collaboration and operational continuity.
- (e) Blockchain for Knowledge Security Use blockchain technology to secure sensitive knowledge, ensuring data integrity and preventing unauthorized access. This approach is particularly relevant for maintaining the security of real-time operational data and sensitive procedures.



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- (f) Knowledge Crowdsourcing Initiative
 - Encourage employees to collaboratively contribute and update digital documentation, such as maintenance logs or best practices, in a crowdsourced manner. Use peer reviews and voting mechanisms to validate the quality of contributions, ensuring that knowledge remains up-to-date and relevant.
- (g) To Overcome Digital Adoption Resistance
 - Conduct regular digital literacy training sessions tailored to field and administrative employees to improve comfort and confidence with digital tools. Initiate change management workshops and internal campaigns to build awareness about the long-term benefits of digital KM platforms.

4.3. Recommendations for Effective Strategies for Managing Knowledge (KM) to Support The Work From Anywhere (WFA) Model at BUMA

The SWOT analysis in this study is based on the results of the Value Chain Analysis, which was used to identify the internal and external factors influencing knowledge management (KM) at PT BUMA. This approach ensures that each SWOT element is directly linked to the primary and supporting activities within the organization's value chain, resulting in a detailed SWOT categorization for both tacit and explicit knowledge. This categorization provides a solid foundation for developing KM strategies tailored to the WFA model.

Table 1. SWOT for Tack Knowledge		
BUMA	Strengths – S(a) Senioremployees'practicalexperiencesintegratedintomentoring programs.(b) Established practices for transferringfield-basedfield-basedintuitionduringon-siteoperations.(b) Construction(c) Construction	Weaknesses – W Difficulty in sharing tacit knowledge without direct interaction.
Opportunities – O Facilitating team collaboration through hybrid team-building workshops.	SO – Strategies Develop structured virtual mentoring programs utilizing video conferencing tools to preserve practical knowledge.	WO - Strategies Introduce tacit knowledge documentation initiatives during team meetings or through recorded interview
Treats – T(a) Data security risks when sharing technical knowledge on digital platforms.(b) Loss of tacit knowledge that is not well- documented.	 ST- Strategies (a) Strengthening data security protocols (b) Tacit knowledge documentation system 	 WT - Strategies (a) Combining remote and onsite work (b) Collaborative documentation mechanism

Table 1. SWOT for Tacit Knowledge

Table 2. SWOT for Explicit Knowledge		
Strengths – S	Weaknesses – W	
(a) Availability of documented procedures	Documentation gaps or	
that support operational and technical	outdated explicit knowledge	
tasks (e.g., troubleshooting, safety	affecting accessibility.	
protocols, etc).		
(b) Utilization of cloud-based digital		
platforms for knowledge transfer and		
remote communication.		
SO – Strategies	WO - Strategies	
Enhance cloud-based repository integration to	Regularly audit and update	
centralize and secure documented procedures	documentation to maintain	
and real-time data.	relevance and prevent	
	obsolescence.	
ST- Strategies	WT - Strategies	
Secure explicit knowledge through blockchain	Create redundant systems, such	
to ensure data integrity and prevent breaches	as offline backups, to ensure	
	explicit knowledge availability	
	during outages.	
	 Strengths – S (a) Availability of documented procedures that support operational and technical tasks (e.g., troubleshooting, safety protocols, etc). (b) Utilization of cloud-based digital platforms for knowledge transfer and remote communication. SO – Strategies Enhance cloud-based repository integration to centralize and secure documented procedures and real-time data. ST- Strategies Secure explicit knowledge through blockchain 	

Table 2. SWOT for Explicit Knowledge



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Recommendations for KM Strategy

- 1) For Tacit Knowledge:
- (a) Implement virtual mentoring programs using video conferencing tools to share experience-based knowledge.
- (b) Encourage the documentation of tacit insights during team meetings or through recorded interviews with senior staff.
- 2) For Explicit Knowledge:
- (a) Enhance the integration of cloud-based repositories to ensure all documented procedures, protocols, and real-time data are easily accessible.
- (b) Conduct regular audits to ensure all explicit knowledge is up-to-date and secure from potential breaches.
- (c) Conduct regular digital literacy training sessions tailored to field and administrative employees to improve comfort and confidence with digital tools.
- (d) Initiate change management workshops and internal campaigns to build awareness about the long-term benefits of digital KM platforms.

5. Conclusion

This This study identifies the key types of knowledge that must be managed in PT BUMA's Knowledge Management (KM) strategy for the Work From Anywhere (WFA) model, encompassing tacit knowledge (practical experiences, problem-solving techniques, and field-based intuition) and explicit knowledge (documented procedures, operational guidelines, real-time monitoring data, and digital repositories). These components are essential for maintaining operational continuity, enhancing collaboration, and ensuring knowledge accessibility in a remote work setting.

The findings reveal that tacit knowledge, such as practical experiences and field intuition, is critical for mentoring junior employees, identifying risks, and addressing operational challenges, while explicit knowledge, including documented procedures and real-time data, is vital for decision-making and cross-team collaboration. These insights emphasize the need to manage both types of knowledge to ensure effective KM implementation in WFA settings.

Based on a SWOT analysis, recommendations were developed to optimize strengths (e.g., cloud-based platforms), address weaknesses (e.g., challenges in sharing tacit knowledge), leverage opportunities (e.g., cross-division collaboration), and mitigate threats (e.g., data security risks). Strategies include virtual mentoring programs, improved documentation systems, and the integration of secure cloud technologies, as well as innovative solutions such as blockchain for knowledge security and hybrid retreats for co-creating knowledge.

By implementing these strategies, PT BUMA can enhance its KM practices to effectively support the WFA model, ensuring operational efficiency, employee engagement, and knowledge sustainability across remote and field-based operations. These findings not only provide actionable recommendations for BUMA but also contribute to a broader understanding of KM strategies in industries with complex operational demands. Moreover, these strategies can be effectively implemented during PT BUMA's transitional phases, offering a structured approach to adapt to operational changes while maintaining productivity and knowledge flow.

This research has both theoretical and practical implications. Theoretically, it expands the literature on Knowledge Management (KM) strategies in supporting the Work From Anywhere (WFA) model, particularly in the mining sector, by integrating SWOT analysis with Value Chain Analysis. This novel approach provides valuable insights for future studies on KM in similar work environments. Practically, the study offers strategic guidance for PT BUMA in managing tacit and



explicit knowledge to enhance operational efficiency under the WFA model. Recommendations such as virtual mentoring programs and cloud-based repositories can improve knowledge accessibility and cross-team collaboration, supporting the company's digital transformation and business sustainability. For future research, expanding the participant pool to include field workers and middle managers could offer a more comprehensive perspective on KM strategies across different organizational levels.

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