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A Conceptual Framework for Knowledge Management Implementation in Organizations

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Abstract: This study aimed to identify the processes associated with knowledge management implementation and develop a framework with different stages that combines these processes to guide the initiative for implementing knowledge management in organizations. The study was approached from a theoretical perspective. The study contributes to the knowledge management literature by developing a conceptual framework of knowledge management. A comprehensive review was conducted of recent progress and the rapidly growing number of published studies on knowledge management implementation. The review revealed ten critical processes that should be considered to ensure successful knowledge management initiatives. Based on that, a framework for knowledge management implementation is proposed. Specifically, the processes associated with implementing knowledge management are logically distributed among the PDCA framework promulgated and reflecting the four domains of the Plan–Do–Check–Act, which has consistently shown the capability to encompass all processes of effective knowledge management implementation. The framework can be used as a reference for implementing knowledge management initiatives in organizations. Finally, this study emphasizes that continuous process methods are significant in implementing knowledge management initiatives. By placing knowledge management implementation processes in the PDCA cycle, task-based knowledge can be better recognized and understood.

Keywords: Knowledge Management, Implementation, Knowledge Strategy Planning, Knowledge Processes, Performance Measurement, Knowledge Management Improvement, Framework, PDCA Cycle.

1. Introduction

In the modern environment, rapid changes are happening in global marketplaces, customer needs, and technology. Such an environment requires uninterrupted adaptation and transformation of organizations. Furthermore, knowledge becomes critical to surviving in such settings; Knowledge has become the lifeblood of organizational growth and development. Proponents of the knowledge-based view consider knowledge to be the most important strategic resource for long-term sustainable competitive advantage and organizational success [1]; thus, knowledge management (KM) studies have gained academic attention. During the past decade, studies on KM have been published in various disciplines, including business and management, information systems and social sciences. A common implication among KM studies is that effectively managing knowledge brings many positive outcomes and improves organizational performance. In other words, organizations that can handle the knowledge they own will gain a competitive advantage; as a result, many managers want to embrace an initiative for implementing knowledge management in their organizations to increase their competitive advantage and improve their performance [2].

Despite the large number of studies that emphasized the importance of KM in achieving a competitive advantage for organizations, knowledge management implementation (KMI) is ambiguous to many organizations [3], [4]; thus, a critical concern for an organization that intends to embark on a KM initiative is how to accomplish it [5]. One of the reasons behind this situation is the lack of a suitable process for implementing KM [6]. Many KM scholars have asserted that one of an organization's biggest challenges is building a systematic process for managing knowledge. According to [7], organizations face a crucial question regarding what processes an organization should consider for undertaking a KM initiative. [8] argue that the diffuse and inconclusive nature of literature on KM is partly due to a lack of attention to the

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implementation process. [6] A critical challenge facing organizations is building a systematic process for managing knowledge. The former assertations imply that implementing KM requires a solution often structured around the concept of the processes [8]–[10]. Numerous research was done in response to such claims, and as a result, innumerable processes for effective KM initiatives have been proposed in the literature. For example, some researchers focused on the planning processes needed for utilizing knowledge as a base to implement KM [11], [12]; planning seems to be a robust process through which an organization can develop a strategy for effective knowledge processing. Knowledge processes (KPs) also get attention in previous literature, and several attempts were made to identify these processes, such as creating, sharing, storing, capturing, and reusing knowledge [13], [14]. KPs aim to create value for organizations that intend to apply, and consensus arises a processes-oriented knowledge is critical for successful KM implementation [15]. Given the significant role of KPs in creating value, numerous studies have also investigated KPs surrounding issues. For example, some researchers propose different ways to measure KPs [16]–[18], while others focus on presenting specific practices that might enhance and enable KPs in an organizational environment [19]–[21]. Thus far, previous individual studies have proposed various processes surrounding knowledge, including planning, processing, measurement, and improvement. As a result of the preceding efforts, it is evident that the extensive academic literature on KM implementation does not provide enterprises seeking to embrace KM with a comprehensive view. Yet, decision-makers or managers must grasp such a view to guide them in implementing KM initiatives [22]. Consequently, many researchers have advocated the development of a framework that may steer an organization's KM initiative [2], [3], [23], [24]. Developing a framework is essential for an organization intending to embrace KM [23]. The role of the KM framework is to provide guidance and direction for how KM should be done [25] [26]. Yet, no KM framework has become the standard [27] [28].

However, [29] states that KM might have more staying power if a unifying theory can be integrated within KM implementation processes. Also, [30] emphasizes that KM needs to be grounded on accepted theory. Many organizations are still struggling with KM and failing to realize its potential benefits because they lack a solid theoretical foundation to guide them in its implementation [23][31][32]. Nevertheless, there is no standard theoretical foundation for implementing KM [7], [27], [33].

As a result, this study seeks to provide a preliminary conceptual framework that could direct businesses' efforts to implement KM effectively. Two research questions are constructed in line with this aim to aid this study in achieving its goal. What critical processes need to be considered for KM initiatives to succeed? And how to integrate the processes into a framework that might direct an organization in its KM initiatives?

In response to the aim of this study, the authors aimed to utilize the qualitative findings of prior research in this area and put forth a more comprehensive and clear vision of the concept of knowledge management implementation. A comprehensive review was conducted on previous studies to identify the processes surrounding the KMI phenomenon using the meta-synthesis method. By combining descriptive data and examples from theoretical and empirical studies, meta-synthesis can serve the purpose of this study well [34]. Moreover, The meta-synthesis is instrumental in developing a conceptual framework [35], reflecting this study's aim. Furthermore, extracted processes from synthesis studies were integrated with the Plan–Do–Check–Act (PDCA) cycle, which was then introduced as a framework for KM, encompassing all identified implementation processes.

Besides this introductory section, the remainder of this study is organized as follows: first, a review of the processes surrounding KM implementation discussed by various authors in the literature is outlined and provided in section two. Next, an explanation of how the identified processes can be integrated with the (PDCA) framework is presented in section three. Then, a KM framework based on this integrated approach is proposed in section four. Lastly, a conclusion is provided in section five.

2. Knowledge management implementation processes

To successfully manage knowledge, it is prudent to define it clearly. The definition of knowledge adopted here is proposed by [36], who states that KM is not accidental. Typically, the word 'management' implies that 'something' has to be managed, so a set of management activities is directed toward dealing with 'something,' which is 'knowledge'; This means that knowledge is the object of the management process. [37] emphasizes if knowledge is viewed as a critical resource for organizational survival and success, it demands good management like any other resource. [38] define the management process related to knowledge as the planning, organizing, coordinating, controlling, and evaluating of people, structures, processes, tools, and other organizational components to add value to the organization through the production and integration of knowledge. Similarly, [39] refers to KM as a planned and structured approach to managing and leveraging knowledge as an organizational asset to enhance an organization's ability, speed, and effectiveness in delivering products and services for the benefit of clients. From the above, it can be inferred that implementing the KM initiative combines comprehensive management processes targeting knowledge to create a sustainable competitive advantage and improve organizational performance.

Therefore, this section aims to outline a critical process discussed among researchers. After careful analysis and synthesizing of previous KM literature, ten crucial processes have been outlined. Table 1 above lists these processes with the source indicated. The following sub-sections will explain and discuss each process and related aspects.

Table 1: Synthesis of KM Implementation Process

KM Implementation Processes	**Sources**
Business performance analysis	[7], [10]–[12], [33], [40]–[49]
Setting goals for the KM initiative	[5], [6], [10], [38], [40], [43]–[47], [49]–[60]
Define organizational knowledge	[7], [10]–[13], [31], [38], [42], [47]–[50], [54]–[57], [61]–[65]
Selecting KM strategies	[11], [31], [55], [58], [60], [62]–[64], [66], [67], [33], [43]–[47], [49], [52]
Establishing and provisioning KM infrastructure	[5], [6], [42], [43], [45]–[52], [7], [53], [55], [58]–[63], [65], [66], [10], [67]–[70], [11], [24], [33], [38], [40], [41]
Knowledge Processes	--[5], [10], [13], [41], [46], [51], [53], [56], [57], [61], [63], [68]–[71]
KM Outcome measurement	[16], [35], [72]–[77]
KM performance measurement	[17], [78]–[83]
Dissemination and expansion	--[40], [42], [49], [57], [60], [62], [69], [71], [84]
KM Improvement	--[5], [7], [33], [60], [62], [71]

2.1 Business performance analysis

An initial question that needs to handle for any KM initiative is why they need to manage knowledge. KM should be led by the organization's needs[43]; the most successful KM initiative was driven by a strong business need. Different types of drivers may trigger the need for KM. For example, environmental pressures such as rapidly changing socioeconomic and technical factors, globally increasing competition, and changing customer demands for knowledge-intensive products or services enforce the need for KM. If organizations do not fully comprehend what drives their desire for KM, they may create an inefficient KM initiative. Thus, to identify such needs, an organization is advised to analyze their business performance to determine what needs may be addressed by managing knowledge [45]. Analyzing business performance can be a ground way of discovering where KM initiatives might be aimed. For example, there could be quality problems, customer service issues, a shortfall in new product development, or a weakness in making alliances or joint ventures work. Discovering the business performance gaps or shortcomings is one way to align knowledge with an organization's business strategy.

2.2 Setting the goals for knowledge management

KM should not be implemented because it is just "nice to have". It is believed that KM is not an end in itself [39], but it is likely addressed to achieve particular goals. Several researchers state that setting the goals behind KM in an organization is crucial. Every KM initiative should have clear, focused goals that define what KM will achieve. Thus, an initiative for KM must contribute to concrete goals and not remain theoretical. KM is only cost-intensive if it fails to add value to the organization's business objectives. According to [50], The goal of any KM initiative should be value creation. The most successful KM initiatives were driven by adding value to the organization, such as product and service development, operations excellence, sales, and customer service improvement. Therefore to achieve the potential contribution of KM, organizations should specify the goals of KM and disseminate them to the whole organization through diverse communication channels [3]. Setting goals for KM is a better way to harness employees in the organization to reach them [47]. Furthermore, A significant advantage of defining specific KM goals was that it provided organizations with initial metrics to measure whether the goals were being achieved [31] [40].

2.3 Knowledge resource identification

Another process that can be infrared for a successful KM initiative is identifying valuable knowledge. Knowledge is the most vital strategic resource for achieving organizational intent from the knowledge-based view [85]. Therefore, an organization should identify the knowledge it considers helpful in achieving its business goals [52], [86]. As KM is all about managing and utilizing different types of knowledge [62], identifying critical knowledge from an organizational perspective is essential for any KM initiative [49]. In order for organizations to perform knowledge identification, it is necessary to set the criteria by which knowledge can be classified [11]; This involves defining the types of knowledge and their sources [61], [63]. Primary knowledge source refers to where the organization gets its knowledge; knowledge resources vary from organization to organization and can exist in many forms [50]; Thus, organizations should map their

knowledge types to their embodied resources for better utilization and proper management [55]. The most prevalent way to differentiate types of knowledge is to categorize them as either tacit or explicit. Tacit knowledge resides within the individual's mind, usually hidden and difficult to communicate. This type of knowledge is associated with terms such as "skill," "know-how," "working knowledge," and "expertise" that describe knowledge of the ability necessary to perform work. In contrast, explicit knowledge can be articulated, documented and shared across the organization. Explicit knowledge is found in commercial publications, e-mail, the internet, GroupWare, intranets, database, organizational business records and self-study. It is essential to identify knowledge because each kind of knowledge requires different KM strategies [11], [62].

2.4 Selecting a knowledge management strategy

KM strategy can be described as an organization's method for managing and utilizing knowledge. Researchers agree that managing knowledge requires specific KM strategies [87]. KM strategies state what should be implemented in the KM initiative by which methods. Therefore, Selecting a KM strategy is crucial to the success of a KM initiative because the KM strategy that organizations select to approach denotes the application of KPs. One of the most important criteria by which organizations select KM strategies depends on knowledge itself [88]. There are different KM strategies that organizations can approach to manage knowledge, the most dominant including personalization and codification strategy [61], [89]; This classification is based on the distinction between tacit and explicit knowledge. The codification strategy, also named (system-oriented) focuses on the manipulation of explicit knowledge; the personalization strategy (human-oriented) aims to improve knowledge flows and mainly focuses on tacit knowledge manipulation. The above discussion implies that understanding the different organizational knowledge types is key to selecting a KM strategy [43]. Importantly, the KM strategy that an organization may approach not only denotes the KPs application [46], [63] but also helps in identifying the infrastructure needed to implement these strategies [90].

2.5 Establishing and provisioning infrastructure for knowledge management

KM infrastructure reflects the long-term foundation for managing knowledge. KM infrastructure refers to factors essential for increasing the efficiency of KM efforts. In terms of KMI, KM infrastructure is those factors that should be addressed to ensure successful KM strategy implementation. Many researchers claim for KM strategies to be effective, factors that combine the KM infrastructure must be considered [3], [58]. According to [68], KM infrastructure plays a vital role in guiding the performance requirements of KM strategy that an organization may approach or acting as a barrier in case of ineffective performance among these factors. Therefore, establishing and provisioning these factors in the early stage of the KM initiative is essential. Given the importance of KM infrastructure for effective KM strategy implementation, many classifications have been proposed in the literature. For example,[62] classified them as human and technological factors, while [61] described them as organizational and technical factors. Other researchers [20] [3] describe these factors as individual, technological and socio-organizational factors that promote the knowledge strategy execution. Hence, it can be stated that KM infrastructure plays a pivotal role in accelerating various KM strategies; as a result, an organization should identify and use the related factors and the infrastructure based on the chosen strategy. A proper KM infrastructure promotes the achievement of KM goals by utilizing KPs, While ignoring such factors will likely hinder the realization of the full benefits of a KM initiative [56].

2.6 Knowledge processes

Knowledge processes are a collection of activities for manipulating knowledge. Much work on KPs has concentrated on developing one or more of these processes, such as creation, sharing, storing, and reusing [91] [61] [51] [26]. A common interpretation across previous studies is that process-oriented knowledge is a fundamental function of the KM initiative [62]. Through effective KPs, knowledge resources can be exploited for organizations to benefit from using KPs. Since KPs aim to create value for organizations from their knowledge resources [69]; therefore, these processes should be carefully identified and integrated into the organization's business process to harvest its benefits. Laying out a high-level knowledge process is crucial for an effective KM initiative. The choice of a KPs process has to consider the knowledge nature, tacit versus explicit, of the knowledge to be managed [54]. To do this, an organization should first identify the KM strategy to approach [37]. KM strategies used by an organization guide KP's identification. According to the literature [52], [92], existing KM strategies should be transformed into a set of KPs; therefore, selecting a suitable KM strategy leads and facilitate KPs execution.

2.7 Measuring the outcome of knowledge management

An investment in KM is intended to improve organizational performance; therefore, it is crucial to clearly understand KM's potential outcomes and benefits [95]. All organizations demanded better justification for investments in any KM initiative and expected results [33]. Therefore, measuring the KM initiative's outcome is paramount [35]. Without valid and reliable measurement of KM outcomes, it becomes complicated to demonstrate their success. The researcher's implication of this issue implies that KM outcomes are challenging to measure, but their contribution to organizational

business performance is proposed as an instant process [72], [76]. Organizational performance reflects the outcomes of activities carried out by members of an organization. Thus, the outcomes of KPs that an organization may execute must be measured to show that they have generated value or advantages for business performance [75]. The underlying logic behind measuring KPs outcomes is that managing knowledge is not an end, but a means to add value to business performance objectives. Top management needs to know the benefits of investing in the KM and its contribution to business performance; hence measuring KPs outcomes helps to provide such evidence [39]. Several researchers assert the importance of measuring KPs outcomes and focus on this type of measurement by linking different KPs with performance outcomes [16], [35], [73]–[75], [77]. One of the conclusions that can be made from the findings that have been previously cited is that KPs significantly improve desired organizational performance.

2.8 Measuring the performance of knowledge management

KM Performance measurement is the degree to which KPs harness organizational resources to achieve the goals or purposes of KM initiatives. KM performance measurement focuses on the execution of effective KPs and is distinct from but connected to organizational performance measurement [15]. Accordingly, KM performance measurement aims to discover the key factors restraining the enhancement of the organization's performance [16]. The underlying logic behind measuring KM performance is that execution of KPs is affected by some influencing factors; as a result, measuring these factors enables an organization to identify the potential bottlenecks to achieving its desired goals when KPs are executed [17]. Tracking barriers to effective KPs is an integral part of KM initiatives because it provides evidence for continuous improvement [67]. Influencing factors should be measured to define the limitation in KM performance because KPs outcome measurement does not elucidate the problems or identify what actions should be taken [79]. As proposed by researchers, the influencing factors may include culture, management, leadership, organizational infrastructure, and technology. Several researchers focus on this type of measurement [17], [78]–[81]. One of the implications that can be drawn from the findings previously stated is that measuring the influencing factors enables one to discover bottlenecks or obstacles that provide an opportunity to increase KPs' efficiency.

2.9 Dissemination and Expansion

The best way to disseminate knowledge is by systematically transferring the best practice. It is worth noting that one of the fundamental reasons for investment in KM is to establish best practices. Establishing best practices for managing knowledge in an organization will be the ones that ride this competitive wave [69]. Best practices for managing knowledge can be defined as activities that have produced outstanding results or success in a situation [93]. The former definition implies that knowledge practices are only best if it makes successful outcomes based on subjective and objective evaluation. Many scholars assert the importance of formulating and transferring KM best practices among organizations. In the opinion of [62], if the results of KM evaluation indicate that it is worthwhile, then its expansion across the organization is essential. According to [7], demonstrating success with a single KP may encourage arrangements to invest in others. [33] propose transferring the best practices and publicizing testimonials about the benefits of KM. [60] also emphasize capturing the success stories and practices and promoting early results throughout the organization. The former author argued that enthusiasm for the KP will quickly spread based on the benefits derived from KPs execution. Capturing success stories and transferring best practices is crucial for demonstrating the value and worth of KPs to managers, employees, and stakeholders [35]. Best practices should also be embedded into the organization's processes and management model and integral to overall business operations. By reusing best practices, organizations can improve their work, eliminate repeat mistakes, reproduce process improvements, and reduce costs.

2.10 Knowledge management improvement

Improvement is critical for a successful KM initiative [65], [70], [71]. It is believed that any organization attempting to implement KM shall be able to continually improve its efforts and increase its maturity to achieve its KM goals [94]. One of the most important reasons for continuous improvement in any KM initiative is that when applying KPs, many barriers tend to arise that prevent the effective generation and sharing of knowledge [94], [95]. Thus, improvement or remedial actions might be needed to respond to a lack of performance in a particular element [33]. According to [7], processes targeted at improvement occur when work is accomplished. Therefore, failings and remedial action should not be ignored [45]. Otherwise, the KPs will be random and unsystematic[19]. Failure can be avoided by taking actions to improve KPs' efficiency, or in other words, by dealing with the overall set of organizational activities that positively affect KPs [96]. Researchers have identified several practices relevant to improving and enhancing the KPs, including human resource practices and technology tools that support creating, transferring, and accessing knowledge. A growing interest in this area indicates improving the conditions that combine the KM infrastructure is essential in improving the KPs and supporting organizations intending to embark on a KM initiative [20].

3. Integration of the knowledge management implementation processes

From the above review, it is clear that several processes need to be considered for a successful KM initiative. Therefore, it is argued that a KM initiative should take account of all processes identified and discussed in the previous section. Ignoring just one of these processes will limit the successful implementation of the KM initiative. Given the preceding arguments, a sound theoretical framework incorporating various processes is required to explain how these processes can be integrated with such a framework. KM needs to be grounded in a solid theoretical foundation, and an inadequate theoretical underpinning makes understanding and explaining how and why implementation succeeds or fails challenging. Therefore, developing such a framework can help practitioners understand the tasks and investments associated with KM and identify elements that make sense in their context. KM framework is a high-level approach for outlining the processes needed to manage knowledge and permits the ability to flow effectively [29], [41]. Thus, by integrating the processes identified in section two with a theoretical foundation, an organization can realize the tasks that must be undertaken during the implementation initiative. Since there isn't a framework widely acknowledged for guiding an organization to embrace KM, Maier & Remus (2002) claim that process management, which incorporates the concept of continuous process improvement, can integrate the life cycle of the KM initiative.

In this study, a well-defined concept, namely, the Plan–Do–Check–Act (PDCA) cycle, will be used to organize the tasks to be performed. The PDCA cycle is also known as the Deming or Shewhart cycle [98]. It is a structured framework aiming to help organizations incrementally improve products, services, or processes. The cycle is an iterative process designed to drive continuous improvement. PDCA as a framework for KM is appropriate and helpful because it goes beyond continuous improvement and provides a complete cycle for the KMI initiative, reflecting the most critical processes identified in the literature. Thus, as shown in (Figure *1*), The PDCA cycle is displayed using four quadrants. We integrate the processes identified in the previous section with PDCA Cycle. The first quadrant is labelled as "Plan", which relates to the processes needed to formulate a plan for KM. This stage includes five processes: business performance analysis, developing KM goals, identifying knowledge resources, determining KM strategies, and establishing KM infrastructure. The second is labelled "Do" and relates to carrying out the KPs following the KM plan. The third quadrant is labelled "Check", which refers to performance and outcome KM measurement. The fourth quadrant is labelled "Act". Act refers to an organization's action in response to measurement results with two processes, including disseminating best practices and taking an improvement action. This integration approach considers all the above-mentioned processes and offers a highly structured framework for organizations interested in implementing a KM initiative. It also provides organizations with a systematic way to ensure that KM is sustainable because the cycle has an iterative rather than a sequential mode.

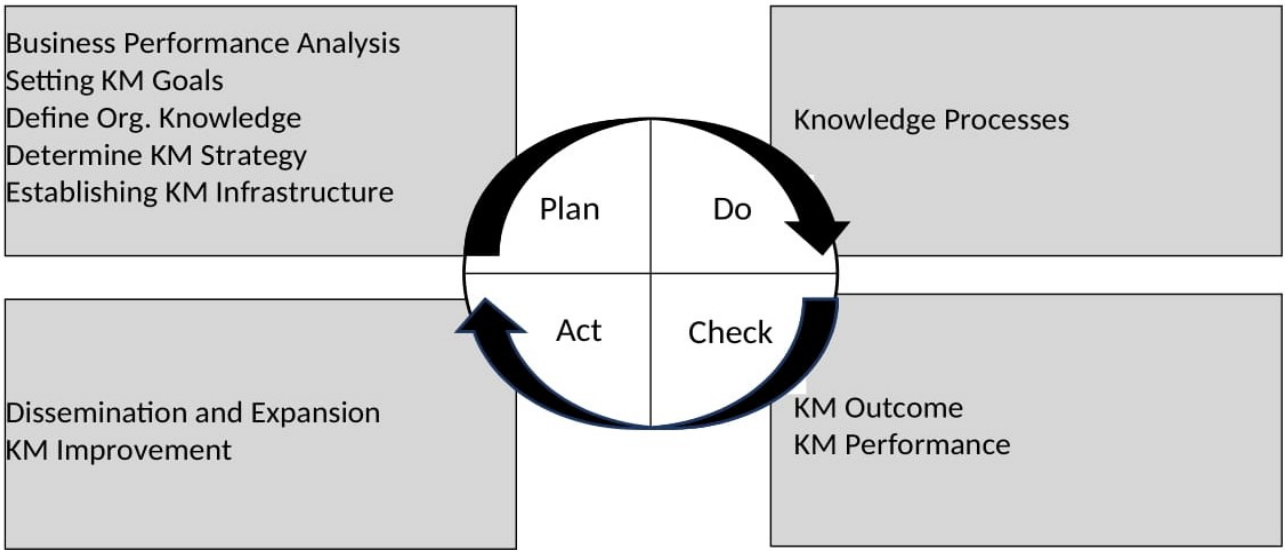

Fig. 1: Integration of KM Implementation Processes with PDCA Cycle

Moreover, embedding KM in the PDCA cycle yields an observation that can be considered in future KM framework development. The structure of a framework for implementing KM should be based on a continuous improvement process because the PDCA framework has a clear structure that explains the tasks that need to be accomplished in each stage. As the PDCA cycle is ongoing incremental improvement, embedding KM in this cycle ensures that an organization can continue its normal business activities while constantly seeking new opportunities to add value to its products, services, and processes. In this way, an organization can ensure that the complete cycle of KM practices is in place and continuously

and systematically applied KM. Therefore, we argue that the PDCA cycle provides the foundation for developing a framework for KM initiatives. The following section explains this argument by explaining the inherent processes in each stage of the proposed framework.

4. Proposed knowledge management implementation framework

Based on the above review, we propose that KMI can be viewed as a process of planning, executing, measuring, and improving knowledge, whether tacit or explicit, for adding value to an organization. Additionally, the success of a KMI lies in adopting a suitable and well-defined framework [3]. Since no theoretical framework for KMI has been accepted, we propose that the PDCA cycle be used. The proposed framework is based on an integrated ten identified processes for implementing KM into the four-stage PDCA cycle. A discussion of each stage and the intrinsic processes follows.

4.1 Plan Stage

Successful KM does not occur through isolated interventions but through a systematic and comprehensive plan outlining the specific component an organization intends to develop. How can the organization creates a plan for the implementation of KM is still challenging, therefore in this stage, organizations are advised to follow five steps to perform their KM implementation Plan: (1) perform a business performance analysis, (2) set goals for KM, (3) identify organizational knowledge, (4) determine the KM strategic direction (5) and establishing and provisioning KM infrastructure (Figure 2).

Accordingly, the first step to be handled is to analyze business performance from an internal and external perspective to identify the driving force behind introducing KM. An initiative for KM is fruitful when it addresses responding to a particular business driver. Several business drivers may trigger the need for KM, such as ICT advancements, changing customer needs, and competition. Defining the business driver's pressures organizations and forces them to respond and react differently. These reactions become the long-term goals an organization must achieve through KM. This implies that the goals of KM should be formulated based on business performance needs. A firm idea of the desired future organizational need is required to set appropriate goals for embracing the KM initiative. However, failure to articulate reasonable goals will push the whole endeavor completely wrong.

When an organization analyses the business performance and the goals set, the next step is to identify the knowledge that is considered valuable to achieve these goals. Organizations seeking to achieve their goals based on KM should strive to identify and demarcate organizational knowledge across various working scopes [52]. Organizational knowledge is a critical resource that should be managed strategically; therefore, addressing KM goals will direct the organization to what knowledge should be managed and how it should be managed. Identifying organizational knowledge is essential for any organization that wishes to implement KM [11]. To identify its knowledge, the organization should choose one or more criteria by which its knowledge can be classified. There are two considerations when performing this task. The first involves defining what types of knowledge (tacit or explicit) are needed to accomplish the identified goals, and the second involves determining where that knowledge resides [61]. Defining the knowledge resources to manage is essential because different knowledge types require different knowledge strategies [11], [23].

Auricle questions arising after identifying knowledge resources are how well they are managed. This question leads to the fourth step, which concerns identifying and selecting the KM strategy. Literature indicates that identifying knowledge resources by knowledge type leads to discovering KM strategies organizations may use to manage their knowledge. Therefore, the details of KM strategy selection vary according to which type of knowledge the target is. For example, when an organization identifies that tacit knowledge resources are most often required to achieve its goal, a human-oriented strategy (personalization) works best. In contrast, when an organization's goals rely on explicit knowledge resources, the system-oriented strategy (codification) makes the most sense.

Lastly, in this stage, appropriate KM infrastructure should support selected KM strategies. The infrastructure of KM is those factors that an organization should be established and provision to ensure KM strategy execution effectively. Therefore, the selected KM strategy provides an opportunity to identify these factors. For example, when a human-oriented strategy (personalization) is selected, the focus will be on human-related factors. In contrast, firms that use a system-oriented strategy (codification) are advised to focus on IT-related factors.

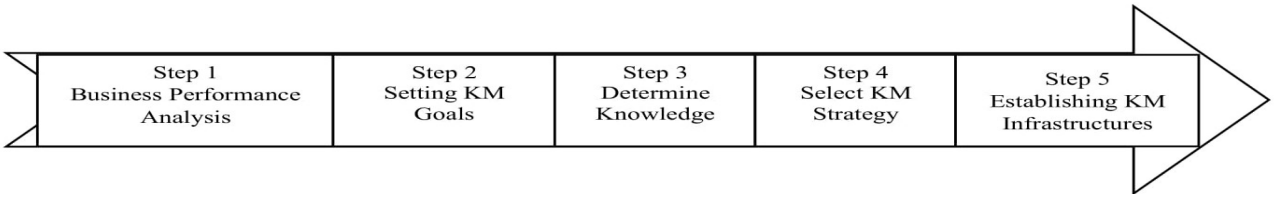

Fig. 2: Plan Stage

4.2 Do Stage

After developing the plan for implementing KM, the next stage concerns the execution of the KM Plan, which is centered on the KP. The KPs are executed with the help of a KM strategy; thus, performing this stage relies on the outcomes of some steps in the planning stage. As shown in (Figure 3), this stage involves manipulating the knowledge identified in step (3) by applying the KM strategy identified in step (4) supported by infrastructure performed in step (5) to achieve the desired goal identified in step (2).

Many KPs can be done in this stage based on the outputs of the first stage. For example, socialization and internalization are crucial when a company chooses a personalization strategy to achieve its KM goals. In contrast, externalization and combination are more effective when a codification strategy is used. Alternatively, all four processes can be used if both strategies are identified as essential [91], [99]. The KP, in this stage, is the activities that the organization derives from the identified KM strategy to manipulate organizational knowledge. This stage requires understanding the work context to drive activities related to these processes. Thus, these processes aim to provide an employee with a related knowledge task or activities related to these processes.

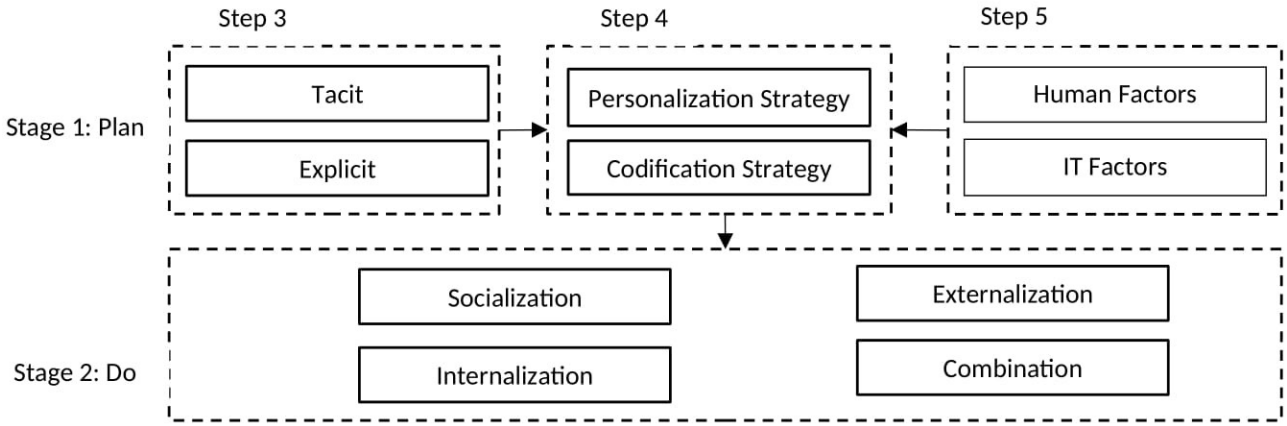

Fig. 3: Do Stage

4.3 Check Stage

Performance measurement plays a pivotal role in the entire KMI. Practical performance measurement should be able to measure KP outcomes and provide evidence for continuous improvement. Hence, it is beneficial to develop a measurement index that combines both the outcome and the influencing factors indicators. As shown in (Figure 4), This stage proposes two-step to measure KM performance. The first step is to measure the KPs outcome to investigate if the executed processes in stage 2 have reached the goals set in step (2) from the planning stage; lagging indicators could be used in this step to evaluate the KPs contribution in terms of KM goals. The second step is related to measuring infrastructure factors that can be derived from step (5) in the planning stage to examine the current state of KPs for investigating potential improvement; leading indicators could be used in this step for tracking any obstacles that may have an adverse impact on the desired outcomes. Therefore, an organization should employ both lagging and leading indicators to measure KPs at this stage. A performance measurement using both indicators can help an organization ensure that its knowledge investment adds benefits to business goals and track any obstacles that need improvement.

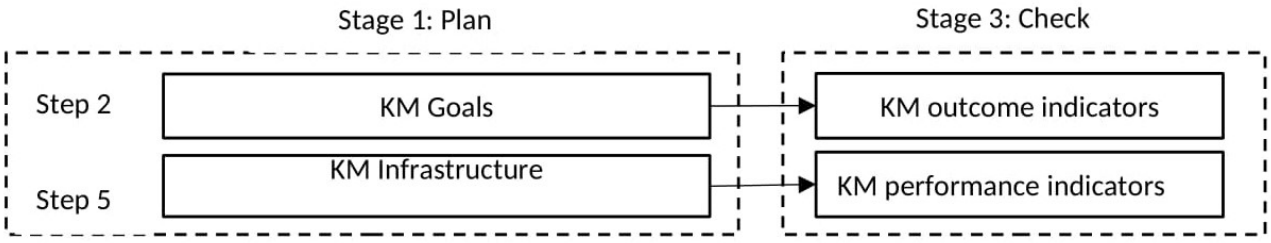

Fig. 4: Check Stage

4.4 Act Stage

It is essential to understand that the KM initiative is a journey rather than a destination. One reason behind this claim is related to dynamic knowledge aspects; The term 'knowledge dynamics' implies that the notion of knowledge that an

individual or an organization possesses is elusive and requires continuous improvement based on evaluation results. Thus, the Act stage in this framework refers to acting based on the outcome of the check stage. In other words, depending on the evaluation outcome, the KM initiative may either need to be modified, or it can be expanded. Typically, a KM evaluation produces either positive or negative results, which means that the KM performance evaluation result represents an opportunity to undertake an action. Therefore, as shown in (Figure 5), the Act stage in this framework consists of two steps involving the dissemination and expansion of best practices and improvement. The dissemination step is necessary to justify that investment in KP has created some benefits for organizational performance based on the goals set for the KM initiative. This step involves capturing success stories from evaluation results, publicizing early results, and transferring best practices to other parts of the organization [25], [55], [62].

On the other hand, an improvement step might be needed to address a lack of performance in specific areas that negatively influence the KPs. Furthermore, the results of the causes of KM problems can be good criteria for selecting the appropriate action to facilitate the implementation of a KM. KPs will be enhanced by all kinds of enablers [46]. Enablers are significantly related to KPs, and improving the condition of enablers in the organization leads to the efficiency of KPs. For example, a potential remedy could include developing individuals or teams (e.g., training, skills), solutions that focus on rewarding individual performance (e.g., incentive/reward systems) or upgrading IT infrastructure. Thus, the best way to improve KPs is to take advantage of these factors. Generally, the KP requires support from various influencing factors that can enhance an organization's capability to manage knowledge effectively and, in return, achieve better performance outcomes [21].

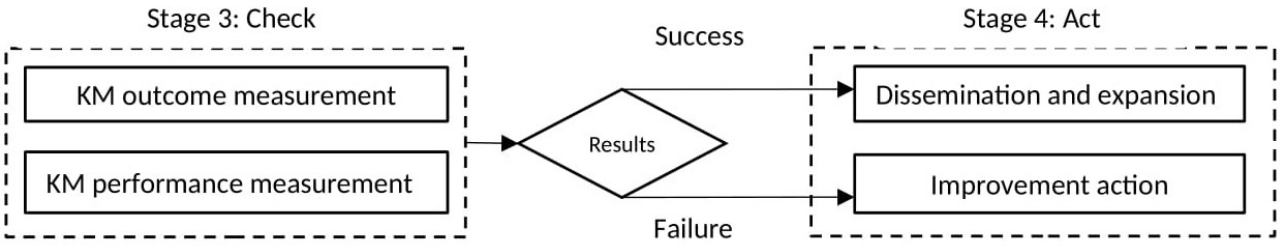

Fig. 5: Act Stage

5. Conclusion

The increasing challenges and uncertainties in the current business environment drive organizations to pay more attention to KM because managing knowledge can lead to a significant competitive advantage. Given its importance, much research has been undertaken on KM. This study reviewed the empirical and theoretical research on KMI and presented an overview of the KM domain, focusing on the implementation processes for KM. After careful analysis and synthesis of relevant literature, ten critical processes have been outlined and identified. The utilization of only one of these processes limits the efficiency and effectiveness of KM. It does not provide organizations seeking to embrace KM with a holistic view of the processes involved. Therefore, we concluded that a new framework for KM combined all the processes identified in previous KM research. Such a framework is essential to ensure that KM is applied systematically. Hence, we suggested integrating the processes into an iterative PDCA cycle. This continuous approach enables organizations to characterize and organize the activities they need to perform in each stage of the KM initiative. The use of the PDCA cycle also ensures that KM improvement is an integral part of the KMI initiative that organizations must realize if they want to implement a successful KM initiative. Thus, we recommend using the PDCA cycle as a reference framework for KMI in an organization.

Recommendations

The proposed framework needs to be validated; therefore, a future study to validate the proposed framework in this study is recommended.

Ethics Statement

This research did not require ethical approval. Data Availability Statement Data associated with the manuscript is public and has been referenced appropriately.

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Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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