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Perspectives of Knowledge Management Systems Implementation

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Perspectives of Knowledge Management Systems Implementation

Abstract

The implementation of systems to manage the knowledge of organizations requires robust technical and non-technical support in order to be successful. Knowledge management systems integrate people, processes, and technology. These systems result in changes in the operations and processes in organizations. The study assessed knowledge management systems from the two main perspectives (technical and non-technical) by emphasizing the technologies that drive the creation, processing, sharing, and storage of knowledge. From the nontechnological perspective, the study focussed on the interaction of people, process and that promote KM. This paved the way for the discussion of the various perspectives or procedures for the deployment and implementation of KM systems in organizations. The study established some protocols and methodology for implementing KM practices in organizations.

Keywords: Knowledge, knowledge management, knowledge management systems, knowledge management implementation.

1. Introduction

Knowledge, either tacit or explicit (Dei, 2019), is a complex set of dynamic skills, know-how (Abubakar, Elrehail, Alatailat, & Elçi, 2019) that is constantly changing and need to be managed (Frost, 2014; Mohajan, 2017) as an organizational asset, process, and object (Dei, 2017). This requires lots of human efforts (Harold, 2012), and the deployment of technology (Al Mansoori, Salloum, & Shaalan, 2021) to facilitate the processing, extraction, sharing, and storage of knowledge (Frost, 2014; 2017).

Management of knowledge entails the identification, sharing, and creation of knowledge (Ganguly, Talukdar, & Chatterjee, 2019). This requires systems for the creation and maintenance of knowledge (Anduvare, 2015; Dei, 2017) and to facilitate the sharing of knowledge (Farooq, 2018). Managing knowledge, therefore, calls for turning personal knowledge, know-how, and tacit knowledge into corporate and explicit knowledge (Mohajan, 2017). This corporate and explicit knowledge can then be shared and used throughout the organization, among the staff within the organization, and beyond (Dei, 2017; 2020; Mohajan, 2017).

Knowledge management (KM) consequently, suggests a correlation between knowledge as an organizational asset/resource, the management functions (Tang, 2017), the goals, objectives, and strategies of the organization (Frost, 2014). It is concerned with the development of knowledge assets of an organization (Hoaihongthong, 2021) to further the organization's objectives (Demir, Budur, Omer, & Heshmati, 2021).

From the process point of view, KM can be seen as the process of managing information and knowledge (Hajric, 2017) and their usage in organizations (Anduvare, 2015). The knowledge must be identified, captured, processed structured, leveraged, and shared (Barão, de Vasconcelos, Rocha, & Pereira, 2017) as an organizational asset to enhance organizational performance (Ha, & Lo, 2018) and competitive advantage (Mohajan, 2017; Owusu-Manu, Edwards, Pärn, Antwi-Afari, & Aigbavboa, 2018; Dei, 2020). This implies that knowledge is recognized as a critical asset and resource by organizations for competitive advantage (Owusu-Manu, et al., 2018; Mohajan, 2017).

The implementation of KM systems in organizations often includes planning, initiation, development, and integration. Motlhakk (2015) found seven steps to use when deploying KM in organizations include assessing the knowledge required in the organization; the degree of knowledge creation, retention, and sharing, obtaining support from the leadership of the organization; designing integrated systems for KM tools and technologies; designing incentives for the use of knowledge; measuring the impact; and promoting and advertising the KM success.

This is a conceptual study that seeks to analyze and assess literature on the topic. The studies draw on various concepts, literature streams, and theories that play different roles and propose new relationships and theories. Therefore, this study is purely qualitative and desk research. It reviews research reports, books, journals, and articles from both manual and electronic sources. This study sought to assess the various perspectives of KM, KM systems, and the implementation strategies in organizations.

2. Knowledge Management System

Many organizations are deploying KM systems as a strategic asset and for a competitive advantage. These systems may be technology bases which emphasizes the technologies or tools that facilitate the creation, processing, storage, sharing, and usage of knowledge (Oliva & Kotabe, 2019; Frost 2014:2018) or nontechnologically based consisting of the processes, culture, and people elements that facilitate KM practices in organisations (Young, 2010; Craig, 2014).

While the people components focus on the individual(s) or groups and the various roles they play in managing knowledge in organizations (Harlow, 2017), the processes are concerned with the process of creating, processing, sharing, storing, and usage of knowledge of organizations (Hajric, 2017; Owusu-Manu et al., 2018). Again, the culture component seeks to address the various protocols, rules, norms, and traditions that guide the knowledge creation, sharing, storage, and use within and outside organizations (Dei, 2017; Anduvare, 2015). Finally, the technology emphasizes the tools/infrastructure that is used to enable knowledge creation, processing, storage, usage, and dissemination in organizations (Al Mansoori, 2021; Anderton & Watson, 2018; Dei, 2017).

2.1. Knowledge Management from Non-Technocentric Perspectives

Organizations seek to use knowledge for competitive advantage (Mason, 2019). As a result, the need for the deployment of systems to manage knowledge (Meihami & Meihami, 2013) in organizations and position them to achieve and gain competitive advantage (Mahdi, Nassar, & Almsafir, 2019). The deployment of KM systems in organizations seeks to address two challenges that are faced by organizations seeking competitive advantage (Mahdi et al., 2019; Halawi, McCarthy, & Aronson, 2017). The first is to enable the organization to work better with all the knowledge created and used in the organization by establishing ways of controlling the knowledge sources aimed at not losing the knowledge created and captured (Demir, Budur, Omer, & Heshmati, 2021). The second is to help organizations use the knowledge to answer business questions to facilitate decision-making processes (Zaim, Muhammed, & Tarim, 2019). Due to this, organizations are better positioned to gather, create and use knowledge for decision making and competitive advantage (Abubakar, Elrehail, Alatailat, & Elçi, 2019)

From the non-technocentric perspective, KM can also be seen to consist of two basic elements namely tactical and strategy (Mohajan, 2017; Koochakzadeh & Behzadi, 2019). Managers in the organizations should focus on linking these elements to KM processes in the organization. (Mohajan, 2017). The emphasis should again be on the use and improvement of knowledge-based assets of the organizations. Also, knowledge as a complex adaptive system requires flexibility in its management to facilitate feedback (Oliva, Couto, Santos, & Bresciani, 2019). As a complex system, it comprises different sources, forms, and values (Barley, Treem, & Kuhn, 2018) in a synergetic connection of productive exchange and value creation. Furthermore, knowledge involves collaborative and symbiotic social (Chedid, Carvalho, & Teixeira, 2020), cultural, values, belief, and work process that shapes the creation, processing, sharing, and usage of knowledge in organizations (Dei, 2017)

KM can also be discussed in the context of business education (Pour & Asarian, 2019). KM thus represents the core work organizations such as schools (Dei, 2017; Brito, Pais, Santos, & Fernandes, 2017). These organizations consist of scholars, practitioners, trainers, learnings, and knowledge promoters who are involved in the creation, interpretation, critiquing, usage, and distribution of knowledge (Brito et al., 2017).

The non-technocentric perspective focus on how individuals and organizations can be equipped to design and facilitate KM processes (Dei, 2017). The elements here include storytelling; cross-functional project team and project specialists working towards a common goal (Frost, 2014); training (developing human resources and imparting skills and know-how); education (transferring know-how, skills, value, beliefs, and norms to groups or individuals through teaching, training, storytelling, research, etc.(Frost, 2014; Young, 2010); meetings, storytelling (Dei, 2017); Communities of Practice (Nonaka, 2005; Dei, 2020); interactive sessions (Frost, 2014); and brainstorming and discussion forums (Frost, 2014; Young, 2010).

2.2. Knowledge Management Systems from the Tecno-Centric Perspective

From the technological perspective, KM systems refer to any kind of information technology (IT) tool or system (Sanzogni, 2017; Qdah & Salim, 2013; Hajric, 2018) that stores and retrieves knowledge, improves collaboration, locates knowledge sources (Ganguly et al., 2019), mines repositories for hidden knowledge, captures and uses knowledge, or in some other way enhances the KM process (Al Mansoori, 2021; Hajric, 2018). These technologies or systems support and improve the management of knowledge (Owusu-Manu et al., 2019), including processes such as knowledge creation, storage, retrieval, transfer, and application (Anderton & Watson, 2018). They also process and generate value from their intellectual and knowledge-based assets (Frost, 2018).

KM systems are engrained in IT systems, information systems (Sanzogni, Guzman & Busch, 2017; Al Mansoori et al., 2021), data science, data mining, and data warehousing (Bhatia, 2019; Sharma & Mehta, 2012). In other words, KM systems are repositories of knowledge from a collection of experts (Hoaihongthong, 2021), organized in such a manner that they can be accessed easily (Anduvare, 2015). Generating value from such assets involves sharing them among employees, departments, and even with other organizations in an effort to devise best practices (Dei, 2017).

The technology based tools include artificial intelligence (Sanzogni et al., 2017; Al Mansoori, 2021), content management, collaboration, content creation, adaptation, personal tools, networking, decision support systems, expert systems (Hajric, 2018; Hecht et al., 2011), data warehousing, data mining (Bhatia, 2019), e-learning systems (Kalyanaraman, Anuncia, & Balasubramanian, 2018; Dei, 2017), communication, groupware systems (Sharma & Deb, 2019), KM 2.0 (Orenga-Roglá & Chalmeta, 2019), the intranet and extranet (Mishra, 2018), decision support systems, content management systems (Laudon & Laudon, 2015; Hajric, 2018; Alosaimi, 2018), document management systems, simulation tools, semantic networks (Hajric, 2018), portals, profile, collaborative tools (Cerchione & Esposito, 2017), urgent requests, document libraries, servers, databases, knowledge bases, blogs, and advanced search tools (Young, 2010).

3. Knowledge Management System Implementation Procedures

The implementation of systems to manage the knowledge of organizations requires robust technical and non-technical support in order to be successful (Frost, 2018, Dei, 2017; 2019). KM systems integrate people, processes, and technology (Al Mansoori et al., 2021). These systems result in changes in the operations and processes in organizations (Frost, 2018; Rao, 2014). Nevertheless, several organizations are still grappling with issues regarding the deployment systems to manage the knowledge of organizations and the practical procedures to implement them.

Practitioners and researchers of KM have tried to develop mechanisms and protocols toward implementing KM practices, concepts, and techniques. These protocols are aided by access to KM

tools by employees, a user-friendly working environment, communities of practice, teamwork and collaborations, and adequacy of capital (Rao, 2014).

Alosaimi (2018) and Oliveira, Caldeira, & Romao (2012) indicate that the procedures include planning, initiation, development, and integration. Motlhakk (2015) found seven steps to guide the deployment of KM systems in organizations which include assessing the required knowledge for the organization; evaluating the extent of knowledge sharing and retention in the organization; obtaining senior management support; designing integrated system of KM tools and technologies; designing incentives for the use of knowledge; measuring the impact; and promoting and advertising the KM success.

Alosaimi (2018) and Dataware Technologies (1999) also outline a seven-step method toward the deployment of KM systems in organizations. These include identifying the problem of the organization; preparing for change, creating a KM team, performing knowledge audits defining key features and solutions; implementing KM building blocks; and linking knowledge to people. This also presents technical outcomes and capabilities that allow for a step-by-step implementation of the KM building blocks mentioned in the sixth stage. These outcomes are:

1. accessing the existing knowledge silos to obtain return on investment (RIO) from the present resources of the organization
2. implement simple knowledge mining for efficient access to knowledge
3. automatically categorize to deal with new knowledge
4. build a knowledgebase and repository to make knowledge available and accessible
5. enable the end-user(s) contribute to the KM process to increase knowledge flow and usage
6. for effective categorization of knowledge, expand the use of metadata and taxonomies
7. locate the KM experts and create a knowledge directory in the organization

Based on the critical success factors to the successful implementation of KM systems propounded by Chong and Choi (2005) provided eleven tremendous essential insights for a successful implementation of KM systems. This was based on the KM enablers propounded by Chong and Choi (2005). These are training employees; involving employees in the process; establish an open and trustworthy spirit of teamwork; empower employees; leadership commitment to the implementation and usage of the system; design an information systems infrastructure; measure performance; develop a knowledge-friendly culture; establish benchmarks; develop a knowledge structure; and eliminate organizational constraints.

Paguio, Fasal, and Gonzales (2016) and Hecht, Maier, Seeber & Waldhart (2011) on the other hand contend that there are three main stages involved in the successful implementation of KM systems in organizations. These include

1. adoption,
2. acceptance

3. assimilation.

The adoption stage is influenced by innovation characteristics (Al-Emran, Mezhuyev, Kamaludin & Shaalan, 2018), fit for purpose, expected results, and communication characteristics (Frost, 2018; Hecht et al, 2011); cultural values (Kayas & Wright, 2018), information quality, organizational viability (Uden, Oshee, Ting & Liberona, 2019), and systems quality (Hecht et al, 2011). It consists of internal analysis of the firm; evaluation of the needs (information and knowledge) (Paguio et al, 2016; Hecht et al, 2011); conducting a cost-benefit analysis (CBA) of the organization by aligning it to the needs and requirement of the organization (Cahyaningsiha, Sensusea, & Noprisson, 2017); and assess the present condition and work profile of the organization and determine how the system fit into the general objective of the organization and how it will either improve or hinder the success of the system. adopt the rule of thumb, the more tacit the knowledge, the less high-tech the required solution (Alosaimi, 2018). For instance, knowhows and skilled knowledge is often supported by IT or communication systems and by expert finders (Hecht et. al. 2011).

The acceptance stage is where the user(s) of the system decides to accept and use the KM system in the organization (Alatawi, Dwivedi, Williams & Rana, 2012). Hecht et. al. (2011), itemized the acceptance of the KM systems as job-fit, ease of use, anxiety, results demonstrability, job-fit, intrinsic motivation, and social factors. The acceptance of the system can be facilitated by involving the users in the development, design, and application of the KM when possible; involving the user in the assessment of the system when appropriate; making the system more user friendly and as intuitive as possible; supporting multiple viewpoints of the knowledge stored in the system; providing acceptable technological and administrative support; and using KM champions to promote the acceptance of the newly deployed system throughout the organization (Frost, 2018).

The final stage, assimilation, shows the business activities and the sharing of KM solutions in the organization (Hecht, Maier, Seeber & Waldhart, 2011). Hecht et. al. (2011) comprehensively outlined the KM systems assimilation as knowledge barrier, KM champions, leadership support, promoting collaboration, process quality, and process cost. The assimilation of KM systems in the organization can be enhanced by managing the content of the KM system through the constant update, revision, filtering, organization, etc (Gamble & Blackwell, 2011); management perceiving the advantage of the system, using it, championing, and convincing others to use it and benefit from the advantage (Hecht et. al. 2011); properly budgeting for the system by planning the expenses and implementation of the KM system that is cost-efficient; and adopting cost-effective collaborative tools such as enterprise 2.0/KM 2.0 systems (Frost, 2018). Hecht et al (2011) finally indicated that these factors naturally dos not necessarily apply to all KM systems deployment or implementation. They posit that some KM systems are relatively direct and straightforward when it comes to their deployment and need not follow these stages.

Furthermore, Aldabaldetrek, Lautiainen & Minkova (2016), Frost (2018), Lingham (2010), and Tiwana (2002) outlined a 4-phase KM system implementation roadmap in organizations. This is regrouped into a 10-step road map. According to Tiwana (2002), this is a guideline for strategizing, designing, developing, and implementing KM systems and initiatives in organizations. The 10 steps and the phases in which they appear are as follows:

1. Phase 1: Infrastructural evaluation
 - a. Analyze the current KM infrastructure
 - b. Align the KM processes with the business strategy of the organization
2. Phase 2: KM system analysis, design, and development
 - c. Design the architecture of the KM and integrate them into the existing KM infrastructure
 - d. Audit the existing knowledge
 - e. Develop KM team
 - f. Create KM blueprint
 - g. Develop the KM system
3. Phase 3: KM system deployment
 - h. Deploy results-driven incremental (RDI) methodology
 - i. Outline leadership issues
4. Phase 4: Metrics for performance evaluation
 - j. Assess the impact of return and performance

The 4-phase (10 step road map) is adopted for this study. The first step calls for analyzing existing infrastructure, then identifying concrete steps that can be taken to leverage and build on KM system. The analysis and accounting of the existing infrastructure involve developing an understanding of various components that constitute the KM systems (Al Mansoori et al., 2021). This is to identify critical gaps in the existing infrastructure and build upon what already exists (Frost, 2018). The key lies in accurately identifying and fixing what will work as a part of the KM system and what will not (Senseuse, 2021). The leveraging of the existing infrastructure (Claver-Cortés, Zaragoza-Sáez, Úbeda-García, Marco-Lajara, & García-Lillo, 2018) in the logical, scientific, theoretical, and financial approach enables a better chance of generating stronger management support for the KM (Rumetna, Lina, Pakpahan, Ferdinandus, Pormes, & Lopulalan, 2021).

The second step in the road map facilitates the connection between the KM and business strategies (Dayan, Heisig, & Matos, 2017). It calls for performing a SWOT (strengths, weaknesses, opportunities, and threats) analysis (Bawack, 2019); create knowledge; create CBA (Cost-Benefit-Analysis) (Rüzgar & Yazici, 2019); analyze knowledge gaps and identify how KM can fill those gaps (Sumbal, Tsui, & See-to, 2017). A balance exploitation, exploration, just-in-time (JIT), and just-in-case (JIC) analysis is also conducted (Maharaj, 2017).

The third step toward the deployment of KM system involves the selection of the infostructure and infrastructural components (Den Hertog & Bilderbeek, 2019) that constitute the KM system architecture (Almeida, de Vasconcelos, & Pestana, 2018); identifying internal and external knowledge source feeds that must be integrated (Bamel & Bamel, 2018); identifying the elements of the interface layer (clients, server, gateways, and the platform) (Gavrilović & Mishra, 2021); and deciding on the collaborative platform and the collaborative intelligence layer (artificial intelligence, data warehouses, genetic algorithms, neural networks, expert reasoning systems, rule bases, and case-based reasoning) (Bhatia, 2019; Sharma & Mehta, 2012).

The fourth step calls for auditing and analyzing knowledge by understanding why a knowledge audit is needed (Hoaihongthong, 2021) and assembling the audit team representing various organizational units (Kashirskaya, Sitnov, Davlatzoda, & Vorozheykina, 2020). The team performs a preliminary assessment of knowledge assets within the organization to identify those that are both critical and the weakest (Lee, Yip, & Shek, 2021; Dei, 2017).

In the fifth step on the KM road map, the KM team that will design, build, implement, and deploy the organization's KM system are identified (Lee et al., 2021; Dei, 2017). Specifically, this stage deals with identifying and designing an effective KM team (Alosaimi, 2016); identifying the key stakeholders both within and outside the organization (Lee et al., 2021; Dei, 2017); identifying sources of expertise that are needed to successfully design, build, and deploy the system while balancing the technical and managerial requirements (Tiwana, 1999; Lee et al., 2021); identifying the critical points of failure in terms of unmet requirements, control, management buy-in, and end-user buy-in (Fink & Ploder, 2009); constitution of KM teams (organizationally, strategically, and technologically) (Obaide, 2004); and balancing the technical and managerial expertise that forms a part of this team (Tiwana, 1999; Alosaimi, 2016).

The KM team identified in step 5 builds upon a KM system blueprint that provides a building plan and incrementally improving a KM system at the sixth stage. This step integrates work from all preceding steps so that it culminates in a strategically oriented KM system design (Tiwana, 2002). Specifically, this stage customizes the details of the layers of the KM architecture; design the system for high levels of interoperability with existing IT investments; optimize for performance and scalability (Clayton, 2021); position and scope the KM system to a feasible level where benefits exceed costs; make the build-or-buy decision and understand the trade-offs (Fink & Ploder, 2009; Tiwana, 2002).

Once the blueprint for the KM system has been created, it calls for the next step (step 7) which involves the actual putting together of a working system. In this step, the interface layer; access and authentication layer; collaborative filtering and intelligence layer; application layer;

middleware and legacy integration layer; and repository layer are developed (Fink & Ploder, 2009; Tiwana, 2002).

The eighth step involves the deployment of the system with a results-driven incremental (RDI) technique (Obaide, 2004; Tiwana, 2002) This step also involves the selection and implementation of a pilot project to precede the introduction of a full-fledged KM. This stage of the KM system must take into account the actual needs of its users (Dei, 2017); identify and isolate failure points in pilot projects; understand the KM system life cycle, systems development life cycle (SDLC) orientation, and its implications for KM system deployment; understand the scope of KM system deployment (Tiwana, 2002).

The ninth step of the KM systems deployment involves understand the role of a chief knowledge officer (CKO) and decide the need to formally have a CKO at all (Harlow, 2017). This decision further requires an understanding of how a CKO relates to the chief information officer (CIO), chief finance officer (CFO) (Dei, 2017; Tiwana, 2002), and chief executive officer (CEO); understanding the enablers of the KM systems (Tiwana, 2002; Harlow, 2017).

The final stage involves measuring business value of KM (Latilla, Frattini, Petruzzelli, & Berner, 2018); measuring return on knowledge investment (RoKI), and account for both financial and competitive impacts of KM on the organization (Tiwana, 2002); calculate return-on-investment (ROI) for KM investments (Muthuveloo, Shanmugam, & Teoh, 2017); decide when to use benchmarking as a comparative knowledge metric (Tiwana, 2002; Den Teuling, 2017); evaluate KM ROI using the Balanced Scorecard (BSC) method; and select software tools for tracking complex metrics (Tiwana, 2002).

5. Conclusion

Knowledge is a set of complex activities and a key organizational resource, and like any organizational resource, it cannot deliver business competitive advantage without a concrete plan. Practitioners and researchers of KM have established some specific protocols for the design, deployment, and implementation of KM systems, concepts, techniques, processes, and practice. The study discussed the perspectives of KM systems implementation from the techno-centric; perspectives with an emphasis on the technologies and, tools, and systems that promote the KM processes (creation, processing, sharing, usage, storage, retrieval) in organizations; and from both the technical and non-technical perspective which seek to deploy both technological systems, people systems, and organizational systems to facilitate the KM processes in organizations

The study established some protocols for implementing KM practices in organizations. Some of the KM systems implementation protocols and procedures in organizations identified in the literature and scholars vary and involve different stages which include planning, initiation, development, and integration. Among the discussions is the seven-stage approach to KM systems

implementation consisting of assessing the required knowledge for the organization; evaluating the extent of knowledge sharing and retention in the organization; obtaining senior management support; designing an integrated system of KM tools and technologies; designing incentives for the use of knowledge; measuring the impact; and promoting and advertising the KM success.

Similar to this is another seven-step approach which includes identifying the problem of the organization; preparing for change, creating a KM team, performing knowledge audit defining key features and solutions; implementing KM building blocks; and linking knowledge to people. The study again provided eleven tremendous essential insights for a successful implementation of KM systems which include training employees; involving employees in the process; establish an open and trustworthy spirit of teamwork; empower employees; leadership commitment to the implementation and usage of the system; design an information systems infrastructure; measure performance; develop a knowledge-friendly culture; establish benchmarks; develop a knowledge structure; and eliminate organizational constraints.

Finally, the four phases which are further grouped into 10 steps road map was discussed. The 10 step roadmap to KM systems implementation in organizations that seek to provide a guideline for strategizing, designing, developing, and implementing KM systems were also discussed. The 10-step road map adopted in this study sought to create a link between KM and business strategies. The roadmap serves as a practical guide towards the design, development, and deployment of KM systems that will help deliver practical business result. This adopted roadmap will enable organizations to build stronger and better KM systems. It is, therefore, necessary to understand the uniqueness of every business entity and organization and contextualize the roadmap since a straight and blanket deployment may not work for all organizations.

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