Information Systems and Knowledge Management: Theoretical Perspective of Associated Interconnection

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Abstract. *It is already acknowledged that recent advancements in information technology, particularly in information systems, have significantly transformed business and organizational practices in different ways. Specifically, it presents various opportunities and challenges that influence how data is transformed into information and subsequently into knowledge. Such context provides numerous ways for managing the environment for such conversions, potentially boosting both individuals and organizations productivity. Due to the continuing development of information systems, knowledge has become much more valuable assets than in the past, as new concepts of knowledge information systems should be intensively approached. This article explores the interactions, links and approaches between knowledge management and information systems. The used research methodology is based on a multi-step search strategy implemented to ensure a thorough collection of relevant literature, meant to gather, analyze and synthesize existing knowledge management and information systems research. Despite the various debates and perspectives surrounding Information Systems (IS) and Knowledge Management (KM), this article has shown that, although these concepts are not new in the academic field, their integration has only recently raised attention as organizations increasingly acknowledge the significance of effective knowledge management.*

Keywords: information system, knowledge management, knowledge economy, knowledge, information

Introduction

For a long time, the search of sources for sustainable competitive advantage has been a highly debated topic in management literature. Despite this, opinions and thoughts regarding the creation of competitive advantages are divided. For example, Porter (1985) proposed that organizations could increase their competitiveness through specific competitive strategies. Overall, the achievement of competitive advantage by organizations is a concept that is the basis of the specialized literature of strategic management (Liao and Huo, 2007). The competitive advantage happens when an organization acquires or develops attributes, or a combination of attributes is

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allowed to overcome the risks. Such attributes can include access to human resources or access to trained human resources that possess the required expertise.

Moreover, in a study of Gupta and McDaniel (2002) regarding knowledge management and competitive advantage, it was shown that there is a vital connection between these two aspects. The variables were conceptualized in terms of organizational efficiency, basic competencies, support, and knowledge sharing. Thus, it turns out that knowledge management can support the creation of long-term competitive advantages, by the designing of new products and innovative processes. In the short run, knowledge management can support the creation of competitive advantages by an efficient flow of information and knowledge within organizations and its networks.

From another perspective, other authors, such as Kogut and Zander (1992) stated that information systems can support knowledge replication that can afterwards enhance the codification of that knowledge. This raises the possibility that information systems could represent a form of organizational knowledge.

Considering the fast-changing of the business and technology environment, the integration of Information Systems and Knowledge Management emerges as an important area for research. Nowadays, organizations are overwhelmed with extensive data and information, but many authors find it as being very challenging to convert this resource into practical knowledge. whereon such processes the interaction between IS and KM becomes essential.

As businesses face unprecedented challenges, such as remote work, globalization, and swift technological advancements, how to manage knowledge effectively becomes increasingly essential. Research in this area can reveal strategies that organizations can implement to preserve critical knowledge, particularly as seasoned employees retire or leave the workforce. The concern about losing organizational knowledge is significant, and studies can provide frameworks for transferring that knowledge to newer team members.

Organizations that effectively integrate IS and KM are often those that can harness collective intelligence to foster creativity and generate new ideas. By investigating how knowledge circulates within an organization and how information systems facilitate this process, it became possible to emphasize the best practices that contribute to innovative results.

Moreover, the ever-changing nature of knowledge itself is important to consider. Knowledge is not fixed; it evolves through experiences, contexts, and interactions. Exploring how IS can adapt to support this dynamic knowledge environment enables us to discover new methods for capturing and managing knowledge in real time.

Ultimately, the research of the common points of Information Systems and Knowledge Management is more than an academic quest; it is a practical endeavor with the potential to transform organizational operations. It involves cultivating environments where knowledge flourishes, where information systems serve not just as tools but as catalysts for innovation and collaboration. The insights derived from such research can help organizations become more agile, informed, and competitive in a constantly shifting world.

Therefore, this literature review aims to investigate the links and relationships between knowledge management and information systems by systematically analyzing existing research and providing insights that can inform future studies and practical applications in the field. Considering the aims of this article, the approached research questions are the following ones:

1. How does the integration of knowledge management (KM) with information systems (IS) enhance organizational access to information and improve decision-making?

2. What are the contextual factors influencing the acceptance and implementation of various information systems in relation to knowledge management processes?

The article highlights a significant research gap in understanding the impact of specific Knowledge Management (KM) processes, such as knowledge storage, protection, and creation, on the acceptance and implementation of various Information Systems (IS), as these areas have been largely overlooked in existing literature. Additionally, there is a need for interdisciplinary collaboration to explore the complex interactions between KM and IS, focusing on human and organizational factors that influence effective knowledge management in dynamic business environments.

This article is structured as follows: it begins by outlining the theoretical framework that will be used to classify and analyze knowledge management research published in the field of information systems. Moving forward, the methodology used to select and review the knowledge management literature in information systems will be described. As well, it will be emphasized the importance of including topics and approaches in the knowledge management research portfolio within the information systems field. Finally, the article will conclude with discussions on the literature review and with recommendations for future research on knowledge management in the context of information systems.

Literature review

This chapter makes a brief review on both concepts of knowledge management and information systems, concentrating on their definitions and key elements, which will later facilitate the exploration of their relationship.

Considering the central elements of the two types of management, it is also necessary to approach the concepts of information, respectively, knowledge. A greater difference between information and knowledge is determined by the transfer process involved. Thus, knowledge has a deeper degree of portability, due to its psycho-social context, its reflects the intuition, creativity and experience of the person who owns such knowledge. Also, the general perception is that knowledge has a higher value than data and information. If data represent instances of reality, knowledge represents truths derived from facts or established through reasoning, using logical methods and techniques.

With all these principal delimitations, in practice the separation of information from knowledge is not always easy to achieve, especially when several interacting people are involved. There are situations where what for one person represents information, for another, with a different capacity and/or a different role, constitutes knowledge.

The rational approach to the concept of knowledge can be described as a linear process of transformation (Winkin, 1996): data is transformed into structured elements of information, information helps to increase the baggage of knowledge, and knowledge can be transformed into wisdom or meta-knowledge, it uses centers and counties (as can be seen in the figure below).

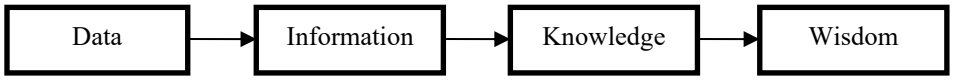

Figure 1. Linear process of knowledge formation

Source: Ancori et al. (2000)

This approach emphasizes the processing of information as an important step in the creation of knowledge for a cognitive entity. Thus, the more data channels exist, the more efficient the formation of knowledge will be.

Information management researchers tend to use the concept of knowledge to suggest that there is value and unity in examining knowledge management systems in comparison to traditional information-based systems.

The theoretical basis of knowledge management research is diverse and includes innovation diffusion theory, absorptive capacity theory and managerial knowledge theories (Boynton et al., 1996). Some research develops theories about knowledge and time specificity of information, using these perspectives to explain information acquisition and environmental scanning behaviors in organizations (Choudhury and Sampler, 1997).

As most of the research done on conceptual approaches, as well this research has its limits. One of them can be considered the ambiguous definition of knowledge management. Although knowledge management became a popular term in the 1990s, similar initiatives existed before the term was widely adopted. To address the problem of nomenclature in identifying knowledge management documents, it was incorporated "organizational learning" and "memory" into the operationalization of knowledge management.

From the beginning, it must be outlined that there is a key distinction between knowledge management systems (KMS) and traditional information systems, primarily related to the ownership of information. In traditional information systems, information is generally perceived as belonging to the organization. Instead, a KMS requires individuals to codify their personal knowledge and share it with others. For a successful KMS implementation, organizations must understand that this difference has significant implications. While both systems need to be easy to use and functional, a KMS also relies on external factors. Thus, organizational and social elements – which can be complex to manage – must be considered during the design, implementation and management of a KMS. Advanced information and communication technologies, especially in the form of knowledge management systems (KMS), are considered essential for the effective management of organizational knowledge. However, understanding the underlying aspects of how to effectively manage knowledge and convert it into actionable outcomes through KMS are critical challenges for both practitioners and researchers nowadays.

Based on the literature review, numerous authors proposed different processes for knowledge management (KM). For instance, Spender (1996) identified KM as including knowledge creation, knowledge transfer and knowledge application. Also, DeLong (1997) similarly sees KM processes as including knowledge capture, knowledge sharing and knowledge application. Expanding such observations, Probst, et al. (2000) emphasized a broader range of KM processes that comprise knowledge capture, knowledge identification, knowledge dissemination, knowledge development, knowledge sharing, knowledge application, and knowledge storage. Other authors, such as Tiwana (2000) pointed out that KM processes operate in a continuous cycle, providing support for Information Systems (IS) users to achieve their main task of creation of new knowledge and sharing this knowledge effectively.

Regarding the reviews of KM processes, based on the literature review, it was found that various systematic reviews was made for different purposes: the connection between KM and knowledge sharing (Asrar-ul-Haq and Anwar, 2016), the study of the outsourcing of KM processes (Edvardsson and Durst, 2014), the influence of KM in global software development (Zahedi, Shahin and Babar, 2016), the key techniques of knowledge sharing in online environments

(Charband and Navimipour, 2016), or sustainable development and knowledge sharing (MCMahon, 2012).

In the last ten years, a high volume of research on Information Systems (IS) have highlighted the important role of knowledge within organizations. In this regard, knowledge was seen as more valuable than any other organizational asset, showing the requirement for an effective management. Knowledge management (KM) developed as a leading research focus in both academic and as well within the practice field (Al-Emran et a., 2018b). As KM is defined as "the process of capturing, storing, sharing and using knowledge". With the help of KM practice in place, organizations can successfully execute such processes. KM can be considered to serve as a vital mechanism that enables efficient discovery and organization of specific information for rapid retrieval and reuse. It is debated that KM represents a crucial asset for modern institutions because it supports institutional learning, growth, success and innovation (Lee, Shiue, & Chen, 2016).

Equally, other papers use knowledge theories to address long-standing research challenges in information systems, such as database design and expert system design. For example, Storey and Goldstein (1993) view database design as a knowledge transfer problem. Similarly, Jonas and Laios (1993) see expert system design as a knowledge transfer challenge. While Nelson and Cooperrider (1996) identify a lack of shared knowledge between information systems and line managers as a contributing factor to poor IS group performance, Boynton et al. (1994) attribute communication problems between developers and users to a deficiency in shared knowledge. Thus, there is ample evidence that traditional concepts in information systems research are being reexamined considering our understanding of knowledge, its creation and transfer.

Although of the numerous previous studies made on KM and IS, no research focused on exploring the relationship between KM and IS processes has been identified. However, numerous studies conducted in recent years have provided valuable information for scholars to understand the influence of KM processes on IS. As well, it has been seen that the studies have intensively overlooked the review of studies on the impact of KM processes on IS acceptance, adoption and implementation. This research aims to support the existing literature by providing an up-to-date synthesis of research on KM processes, focusing on their impact on IS acceptance, adoption and implementation.

Methodology

An essential literature review consists of a key step before making any research study. It designs the basis for knowledge accumulation, facilitating the extension and development of theories, addressing existing research gaps, and revealing areas overlooked by previous studies.

This literature review uses a systematic approach to gather, analyze and synthesize existing knowledge management and information systems research. The objective is to provide a comprehensive understanding of the current state of knowledge, identify gaps in the literature, and suggest areas for future research.

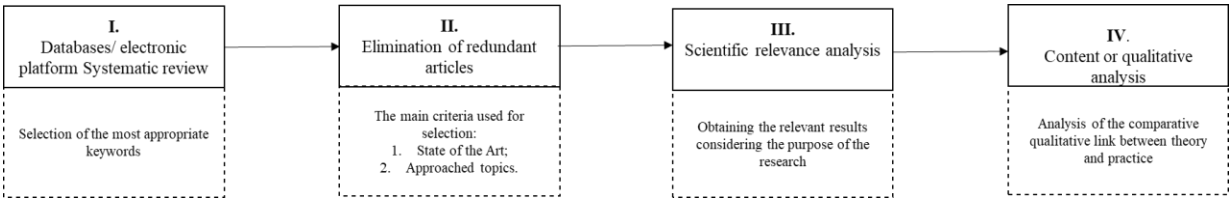

Figure 2. Research methodology model

Therefore, as listed above within the research methodology model, a multi-step search strategy was implemented to ensure a thorough collection of relevant literature. The selection of academic databases, including (i.e. IEEE, Emerald, ScienceDirect, Springer, Taylor & Francis, Wiley, ACM Digital Library, IEEE and Google Scholar.), was used to secure a broad collection of relevant peer-reviewed articles, conference proceedings and publications. The used criteria for the systemic review is an inclusion one, in the sense that all articles should comprise or involve knowledge management influence or impact on information systems as main keywords and all the articles are written in English. Following the selection of the databases, the search for the most appropriate keywords was taken ("knowledge management", "information systems", "knowledge economy"). By using the inclusion criteria, a number of 45 articles were found, published between 1989 – up to 2024.

Results and discussions

One of the key ideas found within the literature is that the integration of knowledge management (KM) with information systems (IS) can support organizations to access their information more efficiently, leading to improved decision-making (Kebede, 2010). KM processes significantly influence the acceptance and implementation of various ISs. The main objective of this study is to systematically analyze and synthesize the existing literature on this topic to support the improvement of understanding of the contextual factors surrounding KM processes and their links to IS acceptance and success.

Information systems (IS) can deliver numerous opportunities for organizations to efficiently automate, generate and share their knowledge. Successful implementation of a specific IS can only be obtained when knowledge and resources are properly managed. In such an environment, ISs are one of the main keys for the development of knowledge management (KM) (Cerchione & Esposito, 2017). It is stated that KM processes are significant for improving the capacities of a particular technology, and the adoption and effective implementation of such technology is increasingly based on the effective use of these processes. Researchers have proposed different KM processes, each supporting the effective application of IS. Knowledge acquisition is described as the institutional processes that can assist the leverage of existing knowledge and capture new knowledge (Lee et al., 2016). Organizations that possess the capacity to acquire valuable knowledge are more likely to use and implement an information system.

Thus, to understand how information systems can support knowledge management within organizations, it is essential to consider not only the intended positive outcomes of knowledge and its management, but also the negative, unintended consequences. This requires researchers to recognize the diversity of theoretical assumptions about knowledge and its management, and the extent to which the field of knowledge management research captures or neglects this theoretical diversity.

Although the established importance of KM processes such as acquisition, sharing, and application in different ISs, there remains a requirement for further research to explore ISs that have not been covered in the current literature. As well, it is important to state that knowledge storage, protection, and creation are currently still in the early stages of research regarding their relationships with IS. Therefore, future research should aim to focus on the investigation of the impact of these KM processes on a wider range of IS.

This represents a new breakthrough in the study of KM processes and their influence on Information Systems (IS). Moreover, this outcome can be related to the fact that quantitative

methods such as surveys are considered effective for identifying links between constructs in the conceptual model and for accurately analyzing respondents' perceptions (Al-Emran et al., 2018).

Focusing on reviewed studies, it was found that KM processes play an important role in influencing the adoption, acceptance and implementation of ISs. In terms of research methodologies, the study indicates that 56% of the reviewed studies that obtained positive results primarily used questionnaires for data collection. These results highlighted that questionnaire surveys are powerful tools for data collection that can lead to positive results, depending on the context, participants and sampling tools used.

Although KM processes such as knowledge sharing, knowledge acquisition, and knowledge application have shown an important influence on different ISs, there remains an opportunity for further discussions and studies to focus and to explore the impact of such processes on other types of ISs. Apart from it, it was shown that knowledge storage, knowledge protection and knowledge creation were less often reached in relation to their impact on IS. In the same situation, Lee et al. (2016) stated that the influence of knowledge protection on the success and implementation of e-business systems warrants investigation, as its impact on IS adoption and implementation has been largely overlooked. Consequently, future research should address this gap and examine the effects of these KM processes on different types of IS.

Moreover, the global spread of information technology and simplified management systems have diminished the size and labor intensity of business organizations, yet they have simultaneously amplified the significance of the skills and knowledge of those who remain.

Such changes underscore the requirement of an increased management focus on the technological infrastructures, human resources, and collective competencies that generate competitive advantages. In this context, what adds further complexity to the increased importance in knowledge assets is the alignment of these new strategic considerations with broader institutional changes that show threats to existing business knowledge bases. For instance, deregulation, global competition and increased market control have presented significant challenges to traditional methods of sourcing and organizing knowledge and expertise. Consequently, the establishment of interfirm networks and alliances encouraged collaborative knowledge development and transfer, but also forced companies to identify their core corporate skills to protect and enhance them. Similarly, the decentralization of business activities into market-oriented units has led to the erosion or disappearance of specialized forms of expertise that once flourished within central research and development functions and traditional management structures.

Despite the various debates and perspectives surrounding Information Systems (IS) and Knowledge Management (KM), it can be added that, although these concepts are not new in the academic field, their integration has only recently raised attention as organizations increasingly acknowledge the significance of effective knowledge management. Traditionally, IS and KM have been studied within distinct academic fields, resulting in a lack of interdisciplinary collaboration and a limited understanding of their interconnections. Moreover, early research on IS primarily concentrated on technological aspects and system design, often missing the human and organizational factors that are crucial for effective knowledge management. The integration of KM and IS comprise complex interactions among technology, processes, and people, which can make comprehensive study challenging. Additionally, knowledge is inherently dynamic and context-dependent, complicating efforts to manage it within the rigid frameworks of conventional information systems. As organizations evolve and face new challenges, the requirement for integrated approaches to KM and IS has only recently become more evident, leading to a shift in

research focus. Acknowledging these obstacles is vital for grasping the current landscape of research on the integration of IS and KM and for identifying avenues for future inquiry.

Conclusion

Knowledge management has emerged as an important area of focus for both academics and practitioners. Information and communication technologies play a key role in facilitating knowledge management practices. In this context, artificial intelligence has recently gained significant attention. In addition, there is a growing interest in aligning organizational strategies with the sustainability paradigm, driven by urgent concerns expressed by various stakeholders.

Considering the current analysis, the study of Information Systems (IS) and Knowledge Management (KM) is essential for several reasons: **1. Increasing organizational efficiency**: IS streamlines operations by automating processes and facilitating the efficient flow of information. This leads to improved productivity and resource management, enabling organizations to operate more effectively in competitive environments. **2. Facilitating knowledge sharing and collaboration**: KM practices ensure that valuable knowledge is captured, organized and shared among employees. By studying IS and KM, organizations can develop strategies that promote collaboration and knowledge sharing, which are essential for innovation and problem solving. **3. Supporting the decision-making process**: Effective IS provides timely and relevant information to decision-makers, enhancing the quality of decisions made within an organization. Understanding how to use KM in conjunction with IS enables organizations to make informed decisions based on comprehensive knowledge. **4. Stimulating innovation: the integration of IS and KM promotes an environment conducive to innovation**. By facilitating access to a wide range of knowledge and perspectives, organizations can encourage creative thinking and the development of new products or services. **5. Adapting to change:** In a rapidly changing business landscape, organizations need to be agile and responsive. Studying IS and KM equips organizations with the tools and frameworks needed to adapt to new technologies, market trends and customer needs**. 6. Improving competitive advantage:** Organizations that effectively manage their knowledge and use IS can differentiate themselves from competitors. The ability to leverage knowledge as a strategic asset can lead to sustained competitive advantage. **7. Increase customer satisfaction**: IS can improve customer relationship management by providing insights into customer preferences and behaviors. With KM, organizations can tailor their services and offerings to better meet customer needs, leading to higher satisfaction and loyalty. **8. Encouraging continuous learning:** The study of IS and KM promotes a culture of continuous learning within organizations. By encouraging employees to learn from experiences and share knowledge, organizations can foster personal and professional growth in their workforce.

Therefore, by addressing these areas, future research can contribute to a deeper understanding of how integrated KM and IS can drive organizational success, foster innovation, and adapt to the evolving landscape of work and technology. This research is vital for practitioners seeking to implement effective KM strategies and for scholars aiming to advance theoretical frameworks in these interconnected fields.

Shortly, the study of Information Systems and Knowledge Management can be considered vital for organizations seeking to increase efficiency, drive innovation, and maintain a competitive edge in today's knowledge-based economy.

Due of its nature, the current study has different limitations raised from different perspectives such as: selection bias (as the review may primarily include studies that have been published, often favoring positive results and overlooking unpublished or negative findings);

quality of sources (the review may encompass studies of varying methodological rigor, which can affect the reliability of conclusions); generalizability challenges (results from specific studies may not be generalizable to other contexts, populations, or setting).

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