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THE ROLE OF KNOWLEDGE MANAGEMENT IN ORGANIZATIONS: A COMPARATIVE ANALYSIS BETWEEN DEMING'S DEEP KNOWLEDGE SYSTEM AND ISO 30401:2018

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Abstract: Knowledge management is essential for organizations in the operational environment. Thus, this study presents a comparative analysis between two knowledge management systems, the Deep Knowledge System of quality guru William Edwards Deming and the ISO 30401:2018 standard. This research consists of a literature review on the topic to collect evidence for the comparative analysis. The objective was to identify convergences and opportunities for integration between these systems. The main results reveal a strong convergence of principles, such as committed leadership, continuous learning, and a culture of knowledge sharing. The integration of these systems can provide a holistic and effective approach to knowledge management, aligned with continuous improvement and innovation. This study contributes practical *insights* for organizations seeking to improve knowledge management.

Keywords: Knowledge management; Deming's Deep Knowledge System; ISO 30401:2018; Integration; Continuous Improvement.

INTRODUCTION

The Deep Knowledge System is a management approach based on principles developed by William E. Deming, a statistician and quality expert who described this method in his book *The New Economy for Industry, Government, and Education* (DEMING, 1997). These principles have been widely adopted in organizations around the world to improve the quality, efficiency, and effectiveness of processes (Roehrs, 2018; Wong, 2020; and Warm, 2021). In turn, ISO 30401:2018 is an international standard that establishes guide-

lines for knowledge management in organizations (Pawlowsky et al, 2021).

Knowledge management is a key element for the success of organizations in the age of information and globalization (CARVALHO, 2020). ISO 30401:2018 provides a set of internationally recognized guidelines for managing knowledge, while Deming's Deep Knowledge System is widely respected for its principles of continuous improvement and quality (DEMING, 1997). Understanding these two approaches and their interaction can provide valuable insights for organizations seeking to optimize their knowledge management processes (CARLUCCI et al, 2022; IVANOVA, 2022).

Therefore, this paper aims to explore considerations on how Deming's Deep Knowledge System can contribute to the implementation of ISO 30401:2018.

To this end, it focuses on analyzing the relationship between Deming's Deep Knowledge System and ISO 30401:2018, with an emphasis on how Deming's principles can be applied to improve knowledge management in organizations. Aspects such as organizational culture, leadership, continuous improvement, and organizational learning are considered, based on the guidelines established by Deming (1997) and the structure provided by ISO 30401:2018.

To achieve the objectives of this study, a comprehensive literature review was conducted on Deming's Deep Knowledge System, ISO 30401:2018, and best practices in knowledge management.

In addition, case studies of organizations that have successfully implemented Deming's principles to improve their knowledge management in accordance with ISO 30401:2018 were analyzed. The

methodology includes the collection and analysis of quantitative and qualitative data, where appropriate, to assess the impact of Deming's (1997) practices on knowledge management.

The objectives of this study are as follows:

- To analyze the principles of Deming's Deep Knowledge System and their relevance to knowledge management in organizations.
- To analyze how the application of Deming's principles can contribute to compliance with the requirements of ISO 30401:2018.

Through this study, we hope to contribute to the advancement of knowledge in the area of knowledge management and offer useful guidance to organizations seeking to improve their practices in this field, aligning themselves with the guidelines of ISO 30401:2018 and Deming's principles (2003).

LITERATURE REVIEW

Knowledge management is a critical field for organizations in the modern business environment, characterized by rapid change, global competition, and the need for continuous innovation (CASTRO, 2019).

Effective knowledge management involves the creation, acquisition, storage, sharing, and application of knowledge within an organization to improve its performance and achieve its strategic objectives (NONAKA & TAKEUCHI, 1995).

The term "Knowledge Management System" is referenced in ISO 30401:2018,

specifically in requirement 4.4, which is the focus of this article. The first subitem of this requirement is 4.4.1, which presents the topic as detailed in Table 1.

The organization shall establish, implement, maintain, and continually improve a knowledge management system, including the necessary processes and their interactions, in accordance with the requirements of this document.

From 4.4.2 to 4.4.4, requirements are included, each representing a dimension of the knowledge management system, which are interdependent. Recognizing and incorporating these dimensions into the knowledge management system and putting them into practice through a change management process is necessary to implement an effective and holistic knowledge management system within the organization.

Table 1: ISO 30401:2018 – Requirement 4.4.1
Source: ISO 30401:2018

Currently, organizations recognize knowledge as their primary strategic resource for maintaining competitiveness and sustainability in business. According to Davenport and Prusak (1998, p. 6), knowledge is defined as *“a fluid mixture of condensed experience, values, contextual information, and experienced insights, which provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowledgeable individuals and is often embedded not only in repository documents, but also in organizational routines, processes, practices, and norms.”*

It is important to note that knowledge resides primarily in people and, in order to be codified in documents, routines, and organizational processes, it must be shared and disseminated effectively (ALVEZ, 2021).

Thus, knowledge management (KM) aims to manage knowledge through an

appropriate infrastructure (DAVENPORT; PRUSAK, 1998). In Gurteen’s view (1998, p. 6), KM represents *“an emerging set of principles, processes, organizational structures, applications, and organizational design technologies that help knowledge workers dramatically leverage their creativity and ability to generate business value.”*

In the current scenario, characterized by high complexity and constant change, as organizations need to adapt quickly. In this context, effective KM can be a crucial differentiator for the organization (CASTRO, 2019). Technologies play an important role in improving KM effectiveness, and Knowledge Management Systems (KMS) are notable in this regard (MORAIS, 2020). They represent an environment that supports the identification, maintenance, and promotion of knowledge within the organization (DEHGHANI; RAMSIN, 2014).

Alavi and Leidner (2001, p. 114) define a KMS as *“a set of Information Technology-based systems developed to support and enhance organizational processes for the creation, storage, retrieval, transfer, and application of knowledge.”* Damodaran and Olphert (2000) recognize the value of KMS as facilitators of organizational learning, as they capture valuable knowledge existing in processes and documents, making it accessible at the right time and in the right context for people.

Buniyamin and Barber (2004) emphasize that a KMS should cover a set of processes involving the management of knowledge acquisition, creation, storage, sharing, and dissemination. These systems are designed to incorporate all stages that contribute to the effective creation, organization, storage, sharing, and use of knowledge.

One of the challenges faced by organizations is how to transform tacit knowledge into explicit knowledge, making it accessible and usable throughout the organization (NONAKA & TAKEUCHI, 2008). It is in this context that Deming's Deep Knowledge System plays a key role.

Deming's Deep Knowledge System is based on principles that aim to improve organizational effectiveness through efficient knowledge management, as pointed out in the article by Rungtusanatham (2003). Deming emphasized the importance of organizational learning, continuous improvement, and the creation of a culture that values knowledge (DEMING, 2003).

One of the main contributions of Deming's Deep Knowledge System is its emphasis on quality and a systemic approach. He argued that knowledge management should be integrated throughout the organization, involving all employees, from senior management to the factory floor (DEMING, 1997). This is in line with the collaborative and learning approach of ISO 30401:2018.

The ISO 30401:2018 standard establishes guidelines for knowledge management in organizations. It provides a structured framework for the creation, capture, storage, and distribution of knowledge within the organization (ALVEZ, 2021). The standard recognizes the importance of integrating knowledge management into organizational processes, strategies, and cultures, thereby promoting innovation and effectiveness, as pointed out in the article by Montoya-Quintero et al. (2022).

ISO 30401:2018, entitled "Knowledge Management Systems - Requirements," published in November 2018 by ISO, was

designed to provide organizations with uniform access to Knowledge Management as a system. This is due to the growing relevance and scope that this area has gained both in academia and in world-renowned organizations (ALVEZ, 2021). To date, the literature related to the topic remains scarce, and few studies have been conducted based on the requirements established by this standard.

Upon closer examination of these requirements, it can be seen that the standard establishes important guidelines for Knowledge Management, including:

- The need for alignment with the organization's strategic objectives (requirement 4.1).
- The connection with the needs and expectations of relevant stakeholders (requirement 4.2).
- Implementation based on an organizational culture that embraces the topic (requirement 4.5).
- The commitment and leadership of top management (requirement 5.1).
- The identification and treatment of risks and opportunities (requirement 6.1).
- Measurement through indicators linked to a knowledge management policy (requirement 6.2).
- The performance of competent personnel with adequate awareness and communication (requirements 7.2, 7.3, 7.4).
- Updating in response to changes in processes, products, or personnel (requirement 8).

- Monitoring through indicators, internal audits, and critical analysis by management (requirements 9.1, 9.2, 9.3).
- The constant pursuit of continuous improvement, with control of nonconformities through corrective actions (requirements 10.2, 10.3).

In the context of establishing a systemic flow for knowledge development, the central requirement considered in ISO 30401:2018 is 4.4. Therefore, this study focuses on this element, since it serves as a starting point for the construction of a comprehensive Knowledge Management System (MÁXIMO et al, 2020 and CARVALHO et al, 2020).

The convergence between Deming's Deep Knowledge System and ISO 30401:2018 is evident in several aspects. Both emphasize the importance of leadership and senior management commitment in promoting knowledge management. In addition, both recognize the need for a culture that promotes continuous learning and knowledge sharing throughout the organization.

The PDCA (Plan-Do-Check-Act) cycle, one of the cornerstones of Deming's Deep Knowledge System, can be seen as a methodology that aligns with the principles of continuous improvement and performance monitoring in ISO 30401:2018.

Knowledge management plays a critical role in improving organizational performance and innovation capacity. The ISO 30401:2018 standard offers valuable guidelines for knowledge management, while Deming's Deep Knowledge System brings a systemic and continuous learning approach

(EDGEMAN, 2008). The integration of these two systems can result in more effective knowledge management, promoting a culture of learning and constant improvement in organizations. Future research may explore case studies and best practices that demonstrate how these systems can be successfully integrated for mutual benefit.

METHODOLOGY

The literature review forms the basis of this study. A comprehensive search was conducted in academic databases such as PubMed, Scopus, and Google Scholar to identify scientific articles, books, dissertations, and other relevant resources addressing knowledge management, Deming's Deep Knowledge System, and the ISO 30401:2018 standard. This step aimed to provide a solid and up-to-date understanding of the state of the art in the field.

Comparative analysis is a key component of this study. It consists of comparing and contrasting the principles, concepts, and approaches of Deming's Deep Knowledge System with the guidelines established in ISO 30401:2018. This was done systematically, identifying areas of convergence, complementarity, and potential gaps. This analysis will highlight how the Deep Knowledge System can contribute to the effective implementation of the standard.

This methodological approach allowed for a comprehensive and well-founded analysis of considerations regarding Deming's Deep Knowledge System and its contribution to ISO 30401:2018, contributing to the advancement of knowledge in this area and providing valuable *insights* for organizations seeking to improve their knowledge management.

RESULTS ANALYSIS AND DISCUSSION

The literature review revealed a number of relevant findings related to knowledge management, Deming's Deep Knowledge System, and the ISO 30401:2018 standard.

The literature consistently emphasizes that knowledge management is a critical factor for organizational success. Successful organizations recognize that knowledge is a strategic asset that must be managed effectively to improve decision-making, innovation, and overall performance (DAVENPORT & PRUSAK, 1998).

The literature review highlighted the fundamental principles of Deming's Deep Knowledge System, which include the PDCA cycle, emphasis on continuous improvement, fact-based management, and the importance of committed leadership (DEMING, 1997). These principles aim not only to improve the quality of products and services, but also to promote learning and knowledge management within the organization.

The literature highlights the importance of ISO 30401:2018 as a comprehensive guide to knowledge management in organizations. The standard defines principles, processes, and practices that assist organizations in creating, capturing, storing, and sharing knowledge (ISO, 2018). It provides a structured framework for implementing knowledge management effectively.

One of the most notable results of the literature review was the convergence of principles between Deming's Deep Knowledge System and ISO 30401:2018. Both systems highlight the importance of leadership, continuous learning, the involvement

of all employees, and integration with organizational processes as key elements for success in knowledge management.

Both Deming and ISO 30401:2018 recognize that an organizational culture that values knowledge, innovation, and collaboration is essential. This includes promoting knowledge sharing, creating effective communication channels, and eliminating barriers that impede organizational learning.

The literature also addressed common challenges faced by organizations in knowledge management, such as resistance to change, lack of adequate metrics to measure impact, and the need for strong governance to guide knowledge management practices.

Knowledge management is often highlighted as a strategic lever in modern organizations (LONGO, 2019). The literature emphasizes that knowledge is an asset intangible valuable that can provide significant competitive advantages (NONAKA & TAKEUCHI, 1995). Organizations that manage to create, share, and apply knowledge effectively are more likely to adapt to constantly evolving business environments (CASTRO, 2019).

Furthermore, knowledge management is intrinsically linked to innovation (PAWLOWSKY et al, 2021). The ability to learn from experience, incorporate new knowledge, and adapt quickly to change is crucial for success in competitive markets (DRUCKER, 1993). Therefore, the literature review emphasizes that knowledge management is not only about retaining information, but also about creating a culture of learning and continuous improvement.

Deming's Deep Knowledge System, derived from his works and practices, plays a key role in knowledge management. This

system is based on principles that promote quality, organizational learning, and effective knowledge management (DEMING, 1997).

One of Deming's key principles is the PDCA cycle, which emphasizes the importance of continuous improvement, as pointed out by Edgeman (2008). This aligns with the knowledge management approach, which seeks to continuously improve the capture, dissemination, and application of knowledge within the organization (ALVEZ, 2021).

Deming (2003) also emphasized the need for committed leadership and a culture that values knowledge. He argued that organizations should encourage employees to engage in problem solving and fact-based decision making, which requires effective knowledge management (DEMING, 2003).

The ISO 30401:2018 standard was developed to provide organizations with a structured framework for knowledge management. It establishes guidelines that assist in the creation, capture, storage, and sharing of knowledge, aligning with the objectives of knowledge management (CARLUCCIA et al, 2022).

The standard highlights the importance of an organizational culture that promotes continuous learning and knowledge sharing, as well as the need for appropriate metrics to measure knowledge management performance knowledge management, as also noted by Schmitt (2022) and Carvalho et al. (2020). This is in line with the principles advocated by Deming (2003) and emphasizes the importance of integrating knowledge management throughout the organization.

The results of the literature review highlight the relevance of knowledge management as a strategic factor for organizations. In addition, they show how Deming's Deep Knowledge System and the ISO 30401:2018 standard share key principles that can be leveraged to promote effective knowledge management. These results provide a solid basis for comparative analysis and discussion of the implications of integrating these systems in subsequent studies.

CONCLUSION

The integration of Deming's Deep Knowledge System with ISO 30401:2018 in organizational knowledge management represents a significant opportunity for organizations to improve their performance and adapt to an ever-changing business environment.

This study revealed the convergence of fundamental principles, including committed leadership, continuous learning, and a culture of knowledge sharing, between these two systems.

Organizational learning and the pursuit of excellence are common goals that permeate both Deming's Deep Knowledge System and ISO 30401:2018. The integration of these systems can create powerful synergies, promoting a more holistic and effective approach to knowledge management.

However, it is important to note that the successful integration of these systems is not a trivial task. It requires deep commitment from senior management, significant cultural changes, and appropriate metrics to assess progress, as Deming reported in his works on driving organizational change.

Resistance to change and other challenges may arise, but overcoming them is essential to achieving the benefits of integrated knowledge management. The importance and relevance of a standard that establishes requirements for the implementation of a Knowledge Management System contribute significantly to the advancement of management and governance in organizations. What could previously be considered an abstract and intangible concept now becomes something concrete and measurable with the introduction of ISO 30401:2018.

Through the connections established in this research, it has become evident that the topics covered in ISO 30401:2018 are in line with existing literature and provide organizations with a tangible approach to these concepts. This is made possible through management tools and practices that are already employed by world-class companies or those that have emerged in innovation environments. However, these practices are not yet widely recognized and disseminated to organizations that do not fall into these categories.

It can be said that the requirement studied represents the “core element” that guides the “how” of Knowledge Management, as defined in ISO 30401:2018. The other requirements are aligned with the typical characteristics of other existing ISO standards, with specific adaptations related to the topic in question.

The structure of the standard suggests that companies that already implement some ISO standard in their operations, such as ISO 9001 (Quality Management) or ISO 14001 (Environmental Management), may find it easier to implement the requirements of ISO 30401:2018. This is due to several factors, such as the existence of an already

established management culture, with management practices related to existing requirements, the company’s interest in adopting certifiable standards, senior management’s awareness of how these requirements can drive business development, and the internal team’s awareness of the need to improve management.

Finally, there is the possibility of conducting further in-depth studies on the requirements of ISO 30401:2018, exploring each of them in detail by other researchers.

These studies can provide a more complete and in-depth understanding of the factors that assist in the development of organizations that value Knowledge Management as an integral part of their activities, seeking sustainability and continuous improvement.

This study provides a starting point for organizations wishing to improve their knowledge management, offering recommendations based on *insights* from the literature reviewed. As organizations continue to face complex and competitive challenges, the integration of these systems may become an interesting strategy to drive innovation, effectiveness, and long-term success.

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