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Conceptualization of knowledge as dynamic flows: Strategic pillar for sustainable competitiveness

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Abstract. The notion of knowledge, while deeply rooted in philosophy, has expanded in contemporary organizations, particularly with globalization and digital transition. This research presents a thorough theoretical analysis of the conceptualization of knowledge, examining its various aspects and dynamics through the different existing theoretical frameworks, such as the DIKW hierarchy and the SECI model. It also examines the difference between tacit and explicit knowledge, and how these forms interact to encourage the production and sharing of knowledge in modern organizational environments. This article presents a reassessment of traditional knowledge management models in the light of current digital environments, characterized by the emergence of collaborative platforms and artificial intelligence technologies. By incorporating new perspectives, it highlights the limitations of traditional frameworks such as DIKW in understanding knowledge production processes in a world where data moves at an exponential rate. From this theoretical reflection, even if existing models such as SECI are still relevant, they must be adapted to consider the new dynamics of digital collaboration. In this situation, it is essential to include digital and social elements in knowledge management, while considering the complexity of interactions between hidden and explicit knowledge. The theoretical implications of this article encourage a reassessment of knowledge management processes in a globalized and digitized world, Focusing on social interactions and collaborations between organizations in knowledge creation and transfer. It is essential to review traditional models to integrate the fluidity and complexity of knowledge into contemporary organizations.

Keywords: *Knowledge; SECI model; DIKW hierarch; Sustainable competitive advantage; Dimensions of knowledge.*

1. Introduction

The concept of knowledge has fascinated philosophers and thinkers for centuries, being at the heart of debates about human nature, learning and the transmission of knowledge. Although

rooted in centuries of philosophical thinking, it has taken on a new dimension within modern organizations. In a context of accelerated globalization and increasing digitalization, where information flows at an unstoppable pace, data is generated en masse, and artificial intelligence redefines learning processes, knowledge management is becoming a strategic priority for companies. Hence, the interest of this research lies in its significance for contemporary organizations grappling with infobesity and operating in highly digitized environments. In this era of digital transformation, understanding the different facets and dynamics of knowledge has become a strategic imperative. Organizations must effectively harness their information and cognitive resources to maintain a sustainable competitive advantage. Situated at the intersection of philosophy, management science and emerging cutting-edge technologies, this research addresses critical challenges faced by companies: how can massive data flows be transformed into usable knowledge? How can tacit knowledge be integrated into organizational practices? These questions anchor this research in crucial economic and social issues.

Nevertheless, this development has not been without difficulties. From the famous DIKW (Data, Information, Knowledge, Wisdom) model theorized by Ackoff (1989), to more recent approaches such as integrating knowledge management systems into global organizations to generate sustainable competitive advantage (Shujahat et al., 2017), the cleavage of the concept of knowledge remains a major challenge.

However, what is knowledge? While this question may seem simple, the conceptualization of knowledge reveals an underlying complexity. The distinction between data, information and knowledge (Davenport & Prusak, 2000) is essential to grasp the subtleties surrounding this concept. Raw data that refers to uninterpreted objective facts becomes information when analyzed and put into context. Information, in turn, becomes knowledge when it is integrated into a practical framework for action, often enriched by tacit experiences. However, the boundary between these categories remains blurred and it is precisely in this area of confusion that the importance of knowledge management lies.

Nonaka and Takeuchi (1995), by introducing the distinction between tacit knowledge (personal, contextual, difficult to formalize) and explicit knowledge (modifiable, easily transferable), paved the way for a new way of thinking about organizational knowledge creation. Their SECI model, which describes how knowledge flows between these two forms through processes of socialization, externalization, combination and internalization, has become a major theoretical framework in research on knowledge management. However, Żatuchin (2024) explores how current digital and collaborative environments, dominated by digital platforms, redefine interactions between actors. This research suggests that the SECI model may need to be adjusted to better reflect new dynamics of knowledge creation and sharing in these highly digitized contexts, building on new perspectives.

Indeed, the digital transformation has profoundly changed knowledge management. The DIKW (Data, Information, Knowledge, Wisdom) hierarchy has long been used to structure the rise in complexity of data towards practical knowledge and organizational wisdom. But, as Bratianu & Bejinaru (2023) point out, this pyramid may seem too simplistic in a world where collective intelligence and algorithms influence knowledge creation exponentially. Today's companies not only have to manage huge volumes of data, but also use this data to derive relevant information and turn it into actionable knowledge that can lead to innovation.

Innovation, the engine of organizational progress, now depends as much on internal knowledge management as on inter-organizational exchanges. Lei et al., (2023) emphasize the importance of collaboration between companies for sharing innovative practices. Inter-organizational knowledge becomes a strategic resource, allowing companies to benefit from external knowledge that they do not have internally. Thus, the competitive advantage no longer lies solely in an organization's ability to capitalize on its own knowledge, but in its capacity to establish networks of knowledge sharing.

As globalization progresses, the nature of knowledge changes. Particularly in a knowledge-based society, where knowledge and its transfer form the basis of business competitiveness, relying increasingly on their ability to manage, capitalize and transfer knowledge effectively (El Adraoui et al., 2024). It is no longer sufficient for a firm to hold knowledge; it must be able to manage, transfer and above all regenerate it. This is where knowledge management becomes a real strategic issue. Organizations need to understand the difference between tacit and explicit knowledge, navigate a world saturated with data and information, while creating an environment where knowledge is not only stored, but continuously updated and applied in daily practices. By integrating these dynamics, it becomes possible to grasp the intricacies of knowledge conceptualization, not only as an abstract concept, but as a fundamental process in managing and creating value within contemporary companies.

2. Conceptualization of knowledge: a profusion and fragmented literature

a. The structural aspect of knowledge: knowledge and related concepts

Knowledge is a living and contextualized information that aims to serve action. It is appropriate to the individual through his or her socio-professional environment, personal representations, intellectual and cultural background, and exchanges. In fact, there is a permanent confusion between the terms; fact, data, information, competence and knowledge. In other words, these words are used in everyday language in an interchangeable and indistinguishable way. In the same vein, Davenport and Prusak (2000) point out that the confusion between data, information and knowledge has led many organizations to invest large sums of money in knowledge management without achieving good results. Thus, Beylier et al. (2007) state that there is often a confusing area between these related concepts which lends itself to some amalgamation. As a result, they consider that understanding the difference between the three concepts is crucial. The success and failure of an organization often depend on understanding the nature of the knowledge it needs. This is why it is essential to understand the meaning of these terms before delving into the notion of knowledge and its management. Davenport and Prusak (2000) state that *"Knowledge is neither data nor information, though it is related to both..." and further, they say that "data, information, and knowledge are not interchangeable concepts" (p.1).*

i. From facts to data

A data is a discrete, objective, unintentional and raw fact. It is the result of a perception, signal or sign. The data must be contextualized to construct meaning, because it has no meaning in itself. Moreover, if presented out of context, they have little value to the organization. They become information if used for certain purposes. A data is used to show only part of an event and does not allow to build a judgment or interpretation. That is why it cannot be the basis of an action (Davenport and Prusak, 2000).

Data is therefore raw structured numerical information, a raw element that has not yet been interpreted and put into context (Mallie, 2003). Their value can only be perceived if it is generated and applied to create information useful for the organization or an individual. Data are often capitalized in databases, but rarely transformed into useful information and even less exploited as knowledge, effective data management aims to make them available.

ii. From information to knowledge

Based on the work of Blumentritt and Johnston (1999), who consider that information and knowledge are often used interchangeably in research. Ramangalahy (2001) and Ziam (2010) defend the idea of a distinction between these two notions and consider that they are the few authors who have invoked the need to take this distinction into account in order to deal with this amalgam.

In view of this abundance of viewpoints, Bhushan and Rai (2004) consider that information is a set of categorized, classified, corrected data to create a message, most often in a visible form; pictured, written or oral in order to minimize uncertainty, Initiate action and provide important benchmarks for decision-making.

In this context, the information according to Davenport and Prusak (2000) is expressed as a message, and it is the recipient of the message who specifies whether it is an information through a communication channel. From a structural point of view, knowledge is the fruit of information. Given that; it is the interpretation given to the latter which generates knowledge.

Based on the research done by Oubrich (2007) to extract the contribution of organizational theories in distinguishing information from knowledge, the following can be deduced:

- Decision-making approach: considers decision as a series of steps to turn information into knowledge.
- The organizational learning approach: states that the processing of information to generate knowledge is the keystone of the organizational learning process.
- The resource-based approach: considers information as a proprietary resource that the competitor does not have, and which is likely to generate knowledge and acquire ipso facto an advantageous position in the market.

More importantly, the basic idea advanced by proponents of resource-based theory is that good knowledge is a resource that fosters the development of intellectual capital that encourages innovation and fuels improved performance.

These analyses show that the data are derived from a collection of objective facts which form what is called information. This information will be contextualized, used and assimilated and will subsequently undergo the action to give rise to knowledge.

iii. Knowledge

The researchers agreed that knowledge is not just information, but rather a sophisticated stage of organizing, understanding and analyzing information, by skillfully deploying this information within a vast network of complex factors that include many sets or groups of information that help an individual choose the most efficient, effective or best way to find solutions (Zack, 1999).

Knowledge is an abstract, broad and widely used concept. Indeed, the interest in knowledge is not a recent problem. Knowledge has been the subject of an epistemological debate in Western philosophy since Descartes and Kant, until recently Foucault, Kuhn and Popper.

Despite the large number of publications on the concept of knowledge, several researchers (Tsoukas and Vladimirou, 2001; Alvesson and Kärreman, 2001; Spender, 1996) and many others highlight the enigma that characterizes the definition of this concept. Moreover, some do not propose any definition of knowledge and simply state that *"knowledge is what is known" (volkov, 2011, p.19).*

In this sense, Barthelme-Trapp (2003) quoted by Fillol (2009) considers that "*the term knowledge seems to belong to this category of words which we avoid defining for fear of incompleteness and for which our dictionaries are content with references to related terms" (p.72).* On the other hand, there is a wide range of research that has attempted to provide a clear and precise definition of this concept, its nature, characteristics, dimensions and application in organizations.

To enhance this diversity, we refer to some definitions drawn from the work on this subject:

- **Conceptually**

To know, is to mobilize the means to analyze. It also consists of providing the information necessary to guide a meaningful action. O'Dell et al., (1998) defined it as an ability to act or a picture prepared by the mind. In the same vein, Tiwana (2000) stated that *"Knowledge is simply actionable information. Actionable refers to the notion of relevant, and nothing but the relevant information being available in the right place at the right time, in the right context, and in the right way so anyone (not just the producer) can bring it to bear on decisions being made every minute" (p.50).*

More concretely, knowledge involves the analysis and use of information for dissemination purposes. In other words, it is information that is covered by an additional layer of intellectual analysis.

- **At the managerial level**

Knowledge exists not only in documents and databases, but also in organizational routines, standards, processes and practices. Bennet and Bennet (2004) see knowledge as the potential to respond well to problematic and random circumstances. Knowledge is dynamic because it is created in the social interactions between individuals and organizations.

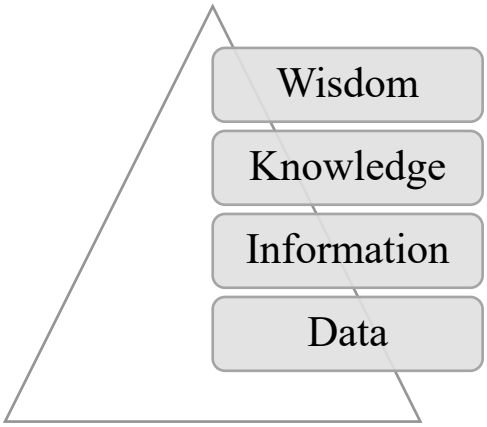
In this research, we chose the definition of knowledge from Davenport and Prusak (2000): Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.

We chose this definition as the reference framework for defining the notion of knowledge and its management, because we consider that knowledge is the aggregation of experiences, values, context information and expert conclusions in each area. It is not only instilled in documents, but also implemented in customary practices, values and norms.

b. The DIKW hierarchy

The origin of the DIKW hierarchy often goes back to the management consultant professor Ackoff (1989) who laid the groundwork for what is now commonly called the hierarchy (D: Data; I: Information; K: Knowledge; W: Wisdom). Ackoff (1989) data have no intrinsic value if they are not organized in a form that can be used to generate information. Knowledge further refines information by allowing the transformation of information into knowledge and wisdom. The latter is perceived as an extrapolative, non-deterministic and non-probabilistic process. It appeals to all levels of consciousness, and more particularly to particular types of human programming (moral codes, ethics, etc.) This is the very essence of philosophical research as Bellinger et al. (2004). The figure below illustrates the traditional knowledge pyramid as originally proposed by Ackoff (1989).

Figure 1: The hierarchy of knowledge.



(Source: Ackoff hierarchy, adapted from Rowley (2006))

The above pyramid is based on the following basic definitions:

- Data refers to objective facts such as: who, what, when, where, about a given subject;
- Information that is linked together in a context to make sense of the data;
- Knowledge that has been understood culturally explains how, why and facilitates understanding;
- Organizational wisdom placing knowledge in a framework for managing and solving human problems. That is, why things should or should not be done in practice.

Otherwise, the comments of some authors go against the DIKW hierarchy (Asadi & Intezari 2020). These authors consider the above pyramid as an unrealistic theoretical model that presents a linear and hierarchical approach by questioning the nature of the interconnections between data, information, knowledge and wisdom. These authors believe that this hierarchy has omitted a main component, which is the intelligence that participates vigorously in the process of transformation that will undergo data, information, knowledge and the implementation of wisdom.

c. Taxonomies and dimensions of knowledge in organizations

Several proposals for typologies and taxonomies have been developed by the authors to categorize and classify knowledge. Knowledge can be individual, social, relational, causal or pragmatic (Alavi and Leidner 2001). This is where the role of transfer comes in, which transforms knowledge into individual or group knowledge through the process of internalization and socialization (El Adraoui et al., 2024). Moreover, knowledge can be considered tacit or explicit (Nonaka 1994; Polanyi 1966). The distinction between explicit knowledge and tacit knowledge is the most well-known classification which underlies several research studies on knowledge and indirectly explains some misconceptions about knowledge and its management in the organizations. The existing literature is rich in knowledge classifications. This richness is criticized in relation to the way of thinking about each taxonomy. In order to understand the specificities of each type of knowledge and how it is managed, it is important to look at some of these most important classifications of knowledge.

i. The epistemological dimension of knowledge: between tacit and explicit

The most famous knowledge classification is that proposed by Nonaka and Takeuchi (1995). These two others have stated that knowledge exists in two forms; tacit and explicit. This distinction was first made by Polanyi (1966) who stated that people can know more than they can say *"we can know more than we can tell" (p.4)*. This classification has served as the theoretical basis for many subsequent academic works in the organizational sciences. This classification relates to the epistemological dimension of knowledge. However, another ontological dimension can be added which presents individual, collective and organizational knowledge separately (Nonaka, 1994).

- Explicit knowledge

Explicit knowledge is knowledge that can be easily codified and transferred in a systematic or formal manner (Woo, et al. 2004, Venzin et al., 1998). Documents and paper, databases, procedures manuals, roadmaps, reference documents, patents, software codes, technical drawings, prototypes, scientific formulas, visual solutions, audio tapes, product specifications or similar manuals and documents form what is called explicit knowledge (Choo 1998; Ahmad and An 2008; Nonaka and Takeuchi 2004). Moreover, this knowledge is official, organized, communicable and organized in databases (Nonaka and Takeuchi, 2004). Thus, which can be transmitted in the form of symbols, signs, words, numbers or are (Quintas, 2005; Nonaka and Takeuchi, 2004) or in the form of a formal and systematic language.

In other words, knowledge is formalized and qualified as declarative. They are usually expressed in words or numbers that can be formally and systematically shared using written, electronic or verbal media. Because the palpable nature of knowledge is a measurable physical entity, it can be more easily discerned and capitalized than tacit knowledge (Awad and Ghaziri 2004). This ordered knowledge is therefore a form of knowledge that can be shared, without loss of meaning, through discourse (Reix, 1995). As a result, explicit knowledge can often be reused within the organization for decision-making purposes.

It should be noted that in a knowledge management approach within an organization, explicit knowledge is used, modified and processed in a convenient way. Nevertheless, the simple and manageable nature of this knowledge has led some researchers to consider it as being of little

importance and to suspect its usefulness (Bukowitz and Williams, 1999; Cook and Brown, 1999).

- **Tacit knowledge**

Tacit knowledge is personal knowledge. They are difficult to formalize and share, because they have a personal character based on personal experience. Conversely to explicit knowledge, tacit knowledge can be difficult to articulate and formalize, it is a form of knowledge very difficult to translate into discourse, as such it is incommunicable by language (Polanyi 1966). Tacit knowledge is the result of experience, training and education, skills, intuition, trade secrets, tricks that are beyond consciousness. The knowledge that an individual possesses at the time of decision-making is driven by intuition (Giampaoli et al., 2017). Tacit knowledge is a purely personal knowledge of the moment when it is anchored in immaterial aspects. This imbrication of the object that holds knowledge and knowledge itself implies that tacit knowledge is contained in people's minds due to the instinct of possession (Newell et al., 2009). Knowledge does not flow properly within organizations because people are not predisposed to share what they know with others (Szulanski, 2002). Moreover, tacit knowledge has a less restrictive aspect due to the illegitimate use of other individuals since it is difficult to access. Nevertheless, explicit knowledge is easily accessible but more vulnerable to illegitimate exploitation (Jasimuddin et al., 2005). In this perspective, Nonaka and Takeuchi (1995) point out that tacit knowledge comprises cognitive elements, patterns, beliefs, mental models, acting on our way of understanding things and technical elements referring to be anchored in well-defined contexts of action.

These authors distinguish two dimensions related to tacit knowledge. More concretely, the technical aspect which brings together skills that are difficult to formalize and articulate, and the cognitive aspect which refers to attitudes of trust, values, mental models, personal feelings and emotions.

Figure 2: The two dimensions of tacit knowledge.

(Source : Nonaka annd Takeuchi, 1995)

In other words, in an organizational context, tacit knowledge (cognitive or technical) is the knowledge held by the employee. They are difficult to communicate to other employees within the organization. Tacit knowledge is often context-specific. It is also based on personal

experience and experience. In this case, one of the main challenges of the human resources management function is to address knowledge retention, by providing solutions to convert tacit knowledge into a form that can be captured for transfer and facilitate the transfer of knowledge between employees.

By way of synthesis, tacit knowledge is distinguished from explicit knowledge which is formalized and can be expressed explicitly. Whereas, tacit knowledge is generally disseminated in dyadic situations through observation, imitation and practice. This knowledge is usually acquired individually and sometimes collectively at the workplace, creating new knowledge through practice while forming a continuous learning loop.

ii. From individual knowledge to organizational knowledge

Knowledge can take many forms and can be categorized into different individual, collective, organizational and inter-organizational categories. In this sense, Rowley (2003) classified knowledge into two broad categories: individual knowledge that resides within an individual mind, and organizational knowledge that results from interactions between technologies, techniques and people. Moreover, individual knowledge and organizational knowledge are two different forms of knowledge.

- Individual knowledge

In the organizational context, each actor has a certain amount of knowledge resulting from a generally subjective and intuitive mental process. This knowledge comes from the interaction of the subject with a fact or raw data put in context and interpreted by the actor, insofar as the individual analyses the data and information to give it meaning (Grundstein, 2002).

Individual knowledge is experiences and practices that can be recorded in different written forms. While, organizational knowledge resides in documents, and may contain organizational processes, practices, and standards (Davenport and Prusak, 1999). Similarly, in the same vein, knowledge created is made fruitful by personal experience, the lived experiences, beliefs and values of the individuals who create it. However, Grant (1996) sees routines as one of the organizational mechanisms for integrating individual knowledge.

Individual knowledge is the product of personal experience and provides insight into an individual's education and initial training, professional experiences, values, beliefs, skills and expertise. This knowledge is tacit knowledge that can be partly explained, exchanged, measured, interpreted and transformed into collective knowledge when shared with other actors in the organization.

- Collective knowledge

Collective knowledge results from dialogue and interaction between the actors in the enterprise and from sharing different individual knowledge (Wenger and Snyder 2000). In this case, the accomplishment of the tasks assigned to each individual requires synergies and a pooling of efforts that is reflected by the sharing of knowledge and experiences. Over time, individual knowledge shared with other collaborators becomes a collective knowledge because it will be held by a group of people (Chua, 2002; Felin and Hesterly 2007). In turn, this collective knowledge is used to provide the organization with a competitive advantage (Alavi and Leidn 2001).

According to Weick and Roberts (1993), collective knowledge is considered as a collective action involving the continuous co-creation of intersubjective sense and mutual understanding. Thus knowledge is undoubtedly linked to the dynamic social context in which it has emerged. Hence the interest in identifying well the reactions and social models of interdependent behaviors among employees that lead to joint or coordinated actions. It is clear from these analyses that knowledge is a social construct created by individuals within the organization.

Collective knowledge is often transmitted orally and implicitly. In the absence of the people who formalized them, this knowledge is difficult to identify and use for other situations and purposes than those in which it was created. In other words, this interference between the creative subject of knowledge and the object makes the dissociation of individual knowledge from collective knowledge relatively difficult.

- **Organizational knowledge**

In other words, organizational knowledge is a knowledge transmitted by the actors of the organization while transcending the simple summation of existing individual knowledge (Reix, 1995). In practice, this knowledge is rooted in the individual and captured by tasks and actions, tools, organizational culture, documents, standards, procedures, rules and routines, etc. However, Hatch (1999) defined organizational knowledge as the result of combining tacit and explicit knowledge to create new knowledge. Unless employees are successful and share their knowledge, individual knowledge cannot be amplified into organizational-type knowledge (Jennex 2009).

Organizational knowledge appears as a dynamic flow instilled in the interactions leading to collective action. This social phenomenon provides individuals with a fertile ground for the creation of mental representations of their activities and tasks from which they interpret new signals from the environment.

- **Interorganizational knowledge**

Inter-organizational knowledge is knowledge transferred between organizations. It refers to the exchange of information at the level of a group of organizations sharing knowledge among themselves, not within one organization (Larsson et al., 1998). Indeed, knowledge is developed not only by the actors within the organization but also by the links created with the different stakeholders including other organizations while developing the capital of inter-organizational knowledge (Wikstrom and Normann, 1994). Some knowledge created and capitalized by the company can be transferred to other organizations. This process of inter-organizational knowledge sharing is based on a balance between using and borrowing the knowledge assets of other organizations, while protecting its own knowledge assets that constitute organizational memory (Levy et al., 2003).

Table 1: Synthesis of the ontological and epistemological dimensions of knowledge.

	Auteurs	**Explication**
Tacit and explicit knowledge	Nonaka & Takeuchi (1995)	Tacit knowledge refers to mental models (mind maps, beliefs, paradigms and viewpoints) developed by individuals. As well as know-how and skills applied to a specific context. Explicit knowledge is knowledge that is articulated, formalizable and transmitted through symbols or natural language.
Individual knowledge	Grundstein 2002	Knowledge exists only in the encounter of a subject with a data, since it is considered as a process of interpretation given to information by an individual.
	Bender & Fish (2000)	Knowledge that is enriched by personal experience, by the beliefs and values of individuals that shape it, so knowledge is attached to the individual who holds it.
Collective knowledge	Guechtouli (2014)	Each individual has his own knowledge, but when shared with the knowledge of other individuals and/or group members, it leads to a collective knowledge.
	Gherardi & Nicolini (2000)	Knowledge is not something that individuals have in their heads, but rather something they do together.
Organizational knowledge	Argote & Ingram (2000)	The organizational knowledge reservoirs confirm the organizational nature of knowledge and why the organization knows more than its members.
	Argote et Darr (2000)	Knowledge that resides in addition to the human component, in the technological components materialized in machines and software, and finally in tasks that reflect the intentions and objectives of the company.
Inter-organizational knowledge	Sindakis & al., (2020)	Inter-firm cooperation may occur in order to access external tacit knowledge which is by its nature hardly transferable.

(Source: Autors).

3. Analysis and discussion of results

The results of this research highlight the complexity and richness of knowledge dynamics in contemporary organizations. Through the exploration of neighbouring concepts, types of tacit

and explicit knowledge, and their interaction via the SECI model, it becomes clear that the creation of new knowledge is not limited to linear processes. On the contrary, results reveal a subtle but crucial interrelationship between forms of knowledge and the contexts in which they evolve.

On the other hand, the DIKW (Data, Information, Knowledge, Wisdom) model, often criticized for its excessive simplification of knowledge management, nevertheless finds a resonance in the observed organizational practices. In some organizations, raw data is still under-utilized due to the lack of a clear process for its transformation into useful knowledge. Where robust knowledge management systems are in place, information quickly becomes actionable knowledge, particularly in environments where interactions between employees allow for the internalization of knowledge.

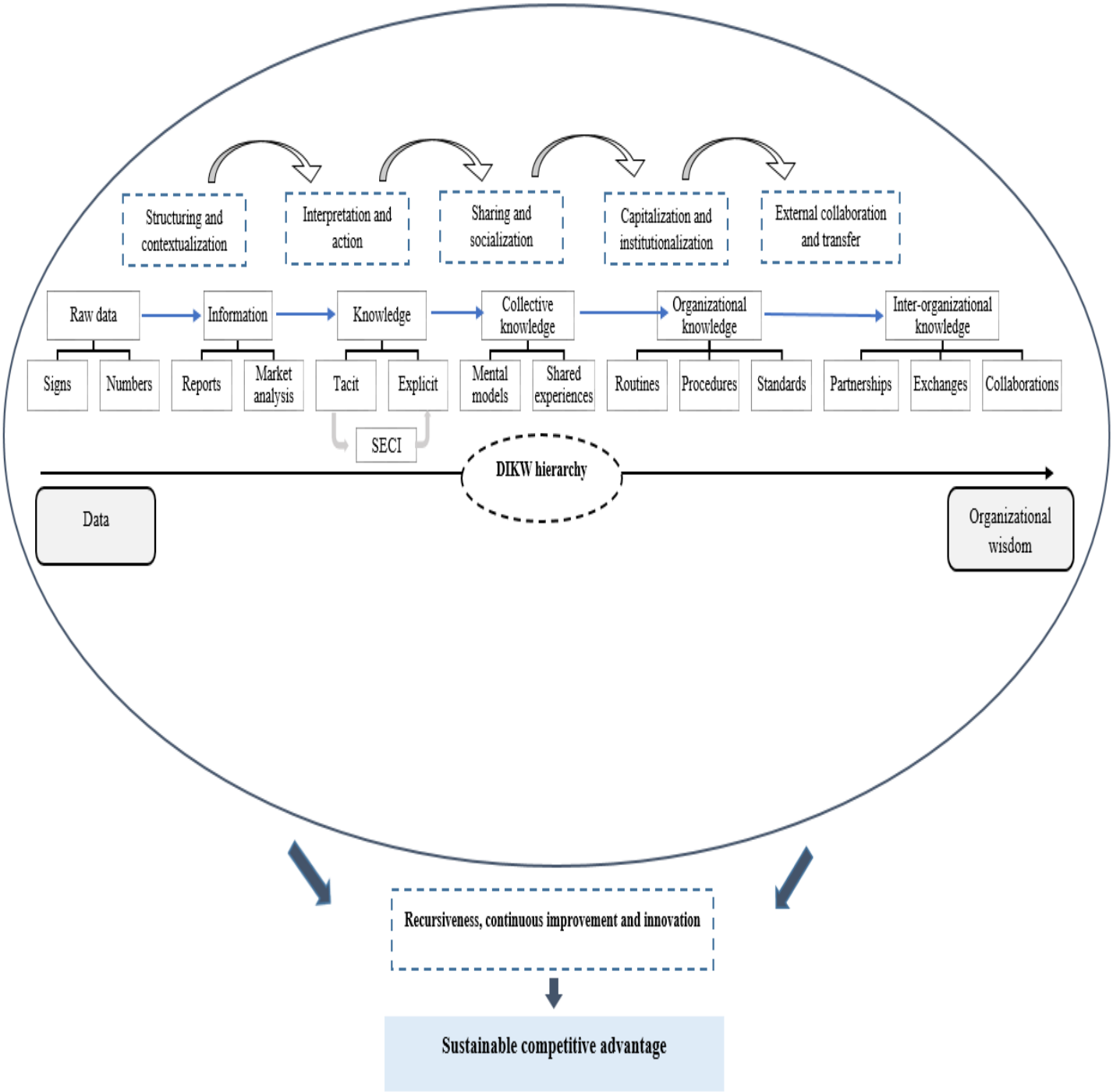
In the same vein, the originality of this research lies in its combinatorial approach, which reassesses classic knowledge management models (such as SECI and DIKW) in the context of today's digital environments. Rather than merely applying existing theories, this work attempts a critique of traditional frameworks, emphasizing the need to incorporate social and digital dynamics into them. This perspective fills a gap in the literature, often focused on internal processes, by also highlighting the growing role of inter-organizational interactions and digital ecosystems.

One key observation is the importance of tacit knowledge transfer. Research-based analysis confirms that, despite technological progress, this form of knowledge remains deeply linked to individual experience, socialization and direct sharing between employees. This difficulty in formalizing tacit knowledge has been extensively addressed in literature (Nonaka & Takeuchi, 1995), and the results of this research reinforce the idea that effective management of this dimension still depends largely on organizational capacities to encourage rich and frequent social interactions. The results of the work mentioned above confirm this observation, stressing that digitalization alone cannot replace the creation of strong social links within teams.

In terms of the codification and dissemination of explicit knowledge, within organizations can greatly improve innovation and decision-making processes. However, organizations that rely exclusively on explicit databases without fostering more nuanced forms of knowledge experience rigidity in their ability to innovate. This tension between codification and flexibility is a strategic issue for companies, and organizations that manage to balance these two dimensions are those that succeed in capturing a real sustainable competitive advantage.

Finally, the analysis of results suggests that exchanges, collaborations and strategic alliances for inter-organizational knowledge transfer have become an increasingly important strategic lever. The analysis corroborates research by Lei et al., (2023), which shows that companies that actively share knowledge across borders through collaborations, partnerships and alliances are better equipped to innovate and thrive. This inter-organizational knowledge transfer provides essential flexibility and adaptability in a globalized environment, facilitating the generation of new ideas and providing access to complementary resources and expertise.

Figure 3: Conceptual framework developed.



(Source: Autors).

4. Theoretical and practical implications

From a theoretical point of view, this research reinforces the idea that knowledge must be considered as a dynamic, recursive and non-linear process. Traditional distinctions between tacit and explicit are useful but do not capture the full complexity of interactions between these two types of knowledge. This research contributes to knowledge management theory by proposing an updated vision of the interactions between tacit and explicit knowledge, integrating new paradigms and digital logics. It advocates moving beyond the oversimplifications of linear models such as DIKW, emphasizing a dynamic, holistic and recursive approach, better suited to contemporary corporate environments. Furthermore, these implications also underline the strategic significance of inter-organizational synergies and alliances in stimulating innovation through knowledge transfer, reinforcing the idea that knowledge is a common good in a globalized ecosystem. The SECI model remains a relevant framework for understanding this dynamic, but it should be enriched by more contemporary perspectives that integrate digital platforms into the process of creating and disseminating knowledge in modern organizational environments.

In addition, this research highlights the importance of inter-organizational knowledge, which is receiving increased attention in the literature on knowledge management. While the focus has long been on internal processes, the results suggest that collaboration and knowledge sharing with other organizations are becoming critical sources of innovation.

In practical terms, the results provide concrete leads for managers and decision-makers. To fully harness the potential of knowledge and its components within their firms, organizations need to encourage rich social interactions, while implementing systems to effectively collect, codify and disseminate explicit knowledge. Moreover, it is essential to foster inter-organizational partnerships and collaborations, recognizing that knowledge is increasingly a resource distributed through cooperative networks. Managers should therefore consider hybrid strategies that combine emerging and even revolutionary technologies with more traditional mechanisms of human and social interaction to capture, transfer and exploit tacit knowledge, and also to foster the transfer of inter-organizational knowledge. To fully exploit the potential of knowledge within their organizations, firms must encourage rich social interactions while developing systems for effectively codifying and disseminating explicit knowledge. It is also essential to foster inter-organizational partnerships and collaborations, recognizing that knowledge is increasingly a resource distributed through cooperative networks.

Managers should therefore consider hybrid strategies that combine emerging technologies with more traditional social interaction mechanisms to capture, transfer and exploitation of tacit knowledge, and also to foster inter-organizational knowledge transfer.

5. Conclusion

The conceptualization of knowledge is a constantly evolving field, at the intersection of philosophy, management sciences, and emerging technologies. Throughout the research, we explored the complexity of transforming data into information, then into actionable knowledge, and finally into organizational wisdom through classical theoretical models and more recent perspectives.

The distinctions between tacit and explicit knowledge, often cited in literature, are fluid in practice. Tacit knowledge, despite its difficulties in being formalized, plays a central role in innovation. It is rooted in lived experiences, social interactions, and knowledge accumulated by individuals within organizations. However, companies that successfully combine this tacit knowledge with structured and codified explicit knowledge are successful in stimulating their adaptability and innovation in a more agile way.

In addition, this study highlights a dimension often underexplored: inter-organizational knowledge. Traditionally, theories of knowledge management have focused on internal processes within organizations. However, in an increasingly globalized and connected world, inter-organizational collaborations are becoming a key catalyst for innovation and skills development. In other words, companies that actively share their knowledge with external partners benefit from a diversity of ideas and increased adaptability. This highlights that knowledge is not only an internal asset but also a common good in a larger ecosystem.

In practical terms, these results should encourage decision-makers to reconsider their knowledge management strategies. While codified knowledge management systems and databases are essential, they are not sufficient. Companies should encourage social interactions and foster ergonomic spaces and innovative ideas for informal exchanges to enable the transfer of tacit knowledge. Top management and managers have a key role to play in orchestrating knowledge exchanges, not only within their teams but also through external collaborations. They must develop a culture of sharing that values both the formalization of explicit knowledge and the recognition of individual tacit knowledge.

Finally, one of the most important conclusions of this research is that knowledge is a dynamic resource. It is not a fixed asset and should not be seen as a mere tangible asset. Knowledge regenerates, it evolves as exchanges, learning and collaborations. Thus, organizations that succeed in surviving and thriving in complex economic environments are those that adopt an integrated approach to knowledge management, combining technology and human interactions, explicit and tacit knowledge, Internal and external collaborations.

- **Future perspective**

This study opens up interesting avenues for future research. First, it would be appropriate to deepen the impact of artificial intelligence technologies on knowledge management, including by exploring how these technologies can facilitate the transformation of tacit knowledge into explicit. In addition, inter-organizational knowledge dynamics deserve special attention as collaborations and digital ecosystems redefine how organizations co-create and share knowledge.

In conclusion, knowledge management can no longer be limited to rigid internal processes. It is a living phenomenon that transcends organizational boundaries, transcends technology and is rooted in the very essence of human interaction. In the age of digitalization, organizations' true wealth lies in their ability to manage the complexity of knowledge and nurture a culture of collaboration, while leveraging technological innovations to amplify these dynamics.

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