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Designing a knowledge management framework for software firms: a case study and theoretical contrast

Diseño de un marco de gestión del conocimiento para empresas de software: estudio de caso y contraste teórico

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Abstract : This study aims to propose a structured set of stages for knowledge management processes in a software development company, contrasting this proposal with theoretical models and previous studies of similar organizations. The methodology involved collecting primary data from a multinational company in the software sector, as well as conducting an in-depth analysis of secondary and tertiary sources from academic databases. The knowledge management variables addressed in this study include knowledge creation, dissemination, application, storage, and intellectual capital. The proposed stages are compared with the collected information to identify sector-specific characteristics. Findings suggest that a knowledge management model tailored to the distinctive practices of these organizations may enhance organizational learning, foster innovation, improve employee collaboration, and deliver strategic value to the company.

Keywords: knowledge, knowledge management, models, organizational learning.

Resumen: Este estudio tiene como objetivo proponer una estructura de etapas para el proceso de gestión del conocimiento en una empresa de desarrollo de software, contrastando dicha propuesta con modelos teóricos y antecedentes de organizaciones afines. La metodología empleada comprende, por un lado, la recolección de información primaria en una empresa multinacional del sector y, por otro, un análisis exhaustivo de fuentes secundarias y terciarias obtenidas de bases de datos académicas especializadas. Las variables de la gestión del conocimiento abordadas en este estudio incluyen la creación, difusión, aplicación y almacenamiento del conocimiento, además del capital intelectual. Las fases propuestas se comparan con la información recolectada, permitiendo identificar particularidades específicas del sector. Los hallazgos sugieren que un modelo de gestión del conocimiento adaptado a las prácticas características de estas organizaciones puede

incrementar el aprendizaje organizacional, promover la innovación, mejorar la colaboración entre los empleados y aportar valor estratégico a la empresa.

Palabras clave: Conocimiento, gestión del conocimiento, modelos, aprendizaje organizativo.

1. INTRODUCTION

In any organization, knowledge is a critical asset, defined as a combination of skills and expertise that enables individuals to address and resolve challenges effectively [1] [2]. Knowledge Management (KM) encompasses the fundamental elements of a business, including suppliers, markets, products, customers, employees, and their surrounding environment. Nonaka and Takeuchi [3] posit that knowledge, when codified, can be systematically transmitted, thus generating a competitive advantage. Knowledge fosters opportunities, creates value, and drives competitive advantage within organizations. Although numerous studies underscore the relevance and application of KM in improving organizational outcomes, certain barriers persist, often shaped by the characteristics of specific sectors or organizations. Consequently, KM remains a vital field of research, focusing particularly on the explicit management of internal resources and processes [4] [5].

Davenport [6] highlights that KM activities have significant impacts on financial outcomes, productivity indicators, and employee competencies, while also fostering innovation and the generation of new ideas within organizations. Similarly, Wiig [7] conceptualized a cause-and-effect framework that illustrates how KM initiatives contribute to knowledge creation and dissemination, providing tangible benefits. Decarolis and Deeds [8] further explored the impact of organizational knowledge, demonstrating how knowledge flow and storage tangibly influence performance metrics.

The initial stages of KM were predominantly associated with the codification of employee knowledge, particularly in less specialized domains and innovation processes [9]. This underscores the opportunity to establish a model that advances the understanding and application of KM. Morse [10] also emphasizes the scarcity of comprehensive theories or explorations within KM, highlighting the imperative for deeper investigation. This research aims to contribute not only to the specific growth of the studied organization but also to the broader body of knowledge. Similarly, Chávez, Olvera, and Romero [11] underline the critical importance of intangible assets in the context of software development companies.

This study, conducted in a multinational organization and informed by theoretical KM models and practical references from other companies, led to the proposal of a KM process with key stages tailored to the practices of software development firms. A comparison with theoretical models revealed certain gaps. The process of software design, which is heavily reliant on the knowledge, skills, and experience of its practitioners, underscores the critical role of effective KM. This study also provides a detailed discussion of its findings and conclusions.

Several scholars have significantly contributed to KM literature. Michael Polanyi argued that knowledge consists of both explicit, object-oriented components and tacit dimensions tied to individual experience, rooted in a system of exogenous values and diffusion mechanisms [12]. Peter Senge introduced the concept of learning organizations, emphasizing the development of competencies and the transformation of knowledge into a sustainable competitive advantage. Nonaka and Takeuchi proposed a comprehensive KM framework encompassing creation, externalization, evolution, dissemination, and storage.

It is essential to highlight that KM practices are adapted to the specific context of each organization and are closely linked to their strategic objectives, including fostering collaboration, deriving lessons learned, driving innovation, and achieving competitive advantage [13]. KM encompasses two fundamental processes: knowledge generation and knowledge management [14]. Knowledge generation involves creating new knowledge through individual contributions, which is then disseminated and shared via databases. This approach emphasizes the vital role of employees as creators of knowledge, integrating organizational culture, processes, and technological tools to ensure success [15] [16].

In the theoretical framework, various knowledge management (KM) models can be identified, which

are addressed in subsequent sections. A KM model is understood as a tool that provides a simplified, synthesized, and conceptualized representation, offering a perspective closely aligned with the description of processes and structures. Such models guide strategies and provide actionable insights [17]. Among the most recognized models, the following stand out as mentioned by [18] and [19]:

– Creation Model: Developed by Nonaka and Takeuchi, this model identifies two types of knowledge: tacit (personal, experience-based knowledge) and explicit (codified knowledge stored in documents). These types of knowledge can undergo processes of socialization (sharing tacit knowledge through experiences and mental models), externalization, combination, and internalization.
– Cognitive Model: This model focuses on processes to establish, delimit, acquire, and group knowledge and experiences, utilizing them to solve problems.
– Community of Practice Model: This approach emphasizes the interaction between hierarchical levels within an organization, where employees contribute values and resources to collaboratively solve problems.
– Network Model: This model highlights processes for acquiring, exchanging, and disseminating knowledge, often facilitated through networks of individuals.

– Rodríguez [20] identifies additional models, including:

– Knowledge Life Cycle Model: Divided into two generations, the first focuses on leveraging technology to create organizational value, while the second prioritizes knowledge sharing through processes, people, and ideas.
– The 10-Step Road Map: This roadmap supports knowledge generation and management by addressing the organization's environment, objectives, experiences, challenges, and needs. Key phases include knowledge acquisition (drawing from skills, meanings, and relationships), knowledge distribution (sharing explicit knowledge with employees), and knowledge application.
– Organizational Culture KM Model: This model is structured into five phases: self-diagnosis (evaluating leadership responsibility, management capabilities, organizational culture, and processes); strategic management; knowledge definition and utilization; change management; and the development of indicators to assess the impact of KM.
– Humanistic Vision KM Model: This model considers organizational culture and climate to foster collaboration and promote KM among employees.
– Process-Oriented KM Model: Tailored to an organization's specific requirements, this model focuses on optimizing resources such as information, human capital, technology, and finances [21]. It emphasizes managing information to capture and institutionalize organizational knowledge and employs diagnostic, design, implementation, and evaluation methodologies for projects.
– Knowledge Rotation Model: Represented as a cyclical process, this model includes activities for configuring knowledge and generating new knowledge and applications. The six processes include acquiring external knowledge, collectivizing and structuring knowledge into products, systems, and processes, integrating knowledge, harmonizing systems, adding value, and identifying opportunities to capitalize on knowledge.
– Bustelo and Amarilla Model: This model emphasizes managing both processes and people, highlighting how individual information systems contribute to organizational knowledge creation [22]. It stresses teamwork and fostering a culture where individuals are motivated to share ideas.
– Functionalist KM Maturity Model: Focused on the development of individuals and organizational capabilities over time, this model outlines nine levels of KM maturity. Employees engage by sharing ideas in critical areas (processes, technology, organization, and people). The first level involves deciding to utilize knowledge; the second focuses on organizational awareness of KM. Subsequent levels include implementing KM infrastructure, initiating KM practices, and ultimately optimizing and fully integrating KM into organizational operations.
– Technological Integration Model: This model builds on leveraging diverse technologies to support KM processes. It presents KM outcomes through an interactive portal, enabling user engagement with knowledge results. It adapts emerging technologies to facilitate the exchange of knowledge and information across informal networks within the organization.
– KPMG Consulting Model: This model focuses on factors that establish learning and its outcomes within an organization [24]. It emphasizes the interaction of key elements such as attitude, leadership, capability, and organizational culture,

demonstrating the interconnectedness of all components within the enterprise.

2. METHODOLOGY

Information was gathered from a multinational software development company through the use of questionnaires to operationalize variables and thereby translate theoretical propositions and concepts into measurable elements. The research variables were defined as follows:

- Dependent Variable: Knowledge management model
- Independent Variables: Organizational culture, the use of information technologies, and intellectual and structural capital.

These variables were measured using indicators derived from questions related to the creation, dissemination, application, and storage of knowledge. To ensure the reliability of the instrument, Cronbach's alpha test was applied to assess the consistency of the questions and validate the tool. Principal component analysis was employed to reduce the dimensionality of the variables. Additionally, secondary data from studies on similar frameworks were obtained from various databases.

3. RESULTS AND ANALYS

The most significant findings were as follows: knowledge generation occurs through employee suggestions, databases that contextualize information, executive meetings to share progress and benefits for the company, and the formal sharing of relevant information while eliminating obsolete data. Functional performance processes are essential; however, certain activities require further implementation. Notably, there are no compensation policies to encourage knowledge dissemination.

Regarding knowledge storage and dissemination, some actions are carried out through proposals that incorporate employees' knowledge and experiences, fostering the acquisition and application of new knowledge, along with critical skills for specific roles. The organization is recognized as a learning-oriented company. However, staff turnover leads to the loss of valuable knowledge. A positive perception exists toward the use of technology and access to updated databases, as well as mechanisms for applying knowledge. Teamwork and training are considered essential, and processes are adequately documented. Nonetheless, the organization lacks established external networks and partnerships. Employees report a positive organizational spirit, job satisfaction, opportunities for skill development aligned with their roles, and job stability.

In terms of structural capital, which encompasses product ownership, strategy, mechanisms for capturing knowledge, innovation processes, and clearly defined hierarchies, the organization lacks sufficient incentives for promoting innovation. Regarding relational capital, the company maintains databases of current and potential clients, fosters positive relationships with them, provides effective support services, enjoys strong supplier relationships, and has well-recognized products. However, customer complaints and claims are not addressed promptly. Subsequently, a principal component analysis was conducted to identify key activities relevant to knowledge management.
Firestone [25] links knowledge management (KM) to executive-level processes through a model that integrates tools and methodologies aimed at achieving organizational objectives. This model demonstrates that KM programs can significantly influence a company's various processes. Mishra and Bhaskar [26], through a literature review, identified that the creation, dissemination, and retention of knowledge are essential, as is leveraging opportunities to enhance organizational learning. Similarly, in the aerospace industry, KM is deemed critical, as it is considered a key factor in fostering practices and values that align with team members' acceptance [27].

Lam and Chua [28] discovered that 82% of KM programs fail to achieve significant organizational impact. They attribute this failure to errors during KM implementation stages, misalignment between organizational vision and strategy, the absence of a learning culture, lack of incentives for knowledge creation and reuse, and insufficient commitment to disseminating knowledge.

Liberona and Ruiz [29], in their study of Chilean companies, identified various challenges to KM adoption and implementation, including inadequate time allocation, lack of training and leadership, insufficient financial resources, and a failure to identify critical processes and knowledge.

In Colombia, a study of KM in four software companies identified weaknesses such as a lack of innovation and research, limited awareness of KM tools and practices, low specialization levels, and adherence to traditional business lines without

considering emerging software market opportunities [30].

Based on these findings, a comparative analysis was conducted to examine the stages of various theoretical KM models in the context of a multinational software development company. The goal was to represent the specific activities typical of such organizations, considering their practices and culture. While existing literature underscores the importance of knowledge and its management, challenges persist, including gaps in understanding the effectiveness of KM processes. This study aims to advance the field by exploring how organizational knowledge management processes can be made more efficient.

The proposed KM model draws from various models outlined in the theoretical framework and is tailored to the specific needs and organizational culture of the company. This alignment ensures consistency between the information collected and the objectives of the model. To explain the proposal, a comparative analysis of the proposed model against other models is presented, detailing differences at each stage, as shown in Table 1.

Table 1: *Comparison of the proposed model with other models*

Stages of the proposed model	Similarities with other models
1. Awareness and Training**:** Educating employees about the model to be implemented, their role within their area, and the main methods and tools for generating, capturing, disseminating, storing, applying, and utilizing knowledge. Induction sessions should be conducted for new employees joining the company. If deficiencies arise in the process, reorientation sessions should also be conducted.	– KPMG Consulting Model: Focuses on lifelong learning and training but does not emphasize awareness, which is critical for fostering organizational knowledge consciousness. – Functionalist Knowledge Management Maturity Model: Does not address staff training during implementation but does provide information on knowledge management. – Community of Practice Approach Model: Includes training with incentives to foster worker cooperation and mentoring but does not mention raising staff awareness. Contribution of the Proposed Model: Highlights the importance and objectives of implementing the KM system. It includes new employees by proposing that induction into the model be part of their onboarding process.
2. Organizational Diagnosis: The current state of the company is assessed through questionnaires and interviews to establish perceptions and KM requirements. External elements related to the company's activities are also considered, and strategies are defined.	- The 10-Step Road Map: Aligns KM with business strategy through a strategic process. - Organizational Culture KM Model: Conducts a self-diagnosis, analyzing management responsibility, KM competence, culture, processes, and knowledge indicators alongside strategic management. However, it focuses on internal factors and does not consider the external environment. - Process-Based KM Model: Develops projects across diagnosis, design, implementation, and evaluation but only internally, neglecting external factors. Contribution of the Proposed Model: Incorporates internal and external audits, key personnel competencies, and visualizes necessary changes to establish a KM system aligned with the company's strategic direction and culture.
3. Determination of Key Knowledge: According to the organization's strategy, it analyzes the knowledge that needs to be captured and created, particularly if it is critical. This knowledge may come from within the company or externally, through consulting firms or alliances with other organizations.	Contribution of the Proposed Model: None of the studied models propose this as a distinct phase. This phase is crucial as it defines the core purpose of KM—identifying, creating, capturing, transmitting, and storing critical knowledge that supports the organization's core activities and generates positive results. The proposed model includes this as a separate phase.
4. Knowledge Creation and Capture: In software development innovation, errors, problems, or defects are seen as opportunities for improvement. Problems are identified through brainstorming and problem-solving methodologies, while barriers are addressed to generate new knowledge. Improvements and new knowledge creation arise from learning by doing, process experiences, or external sources such as technology purchases, reverse engineering, external R&D services, patents, and technological cooperation. Information from customers, suppliers, distributors, competitors, and research institutes is also used	- The 10-Step Road Map: Considers organizational objectives, context, experiences, requirements, and problems in knowledge creation and management. - Knowledge Spiral Model: Includes knowledge-related activities and their outcomes to create new applications and uses. - Cognitive Model: Focuses on creating, locating, capturing, and sharing knowledge for problem-solving, making it very specific. - Knowledge Creation Model: Emphasizes creating explicit knowledge internally or externally, which is shared and internalized as tacit knowledge. - Network Model: Suggests adapting and disseminating knowledge within the organization. - Humanist Vision KM Model: Establishes organizational culture and climate to foster trust and promote KM among employees. - Bustelo and Amarillo Model: Facilitates idea sharing for organizational knowledge dissemination. Contribution of the Proposed Model: Emphasizes the continuous need for updated knowledge and information for the organization's core activities. It includes a dedicated process for this phase and highlights diverse internal and external sources for knowledge creation and capture.

5. Knowledge Transfer and Storage: Knowledge should be located so employees can access it promptly. This involves knowledge repositories for content classification. Explicit knowledge is stored in databases, documents (e.g., process manuals), or tacitly through experts. The company should leverage its technological infrastructure, such as computers, networks, and communication systems. Succession plans should ensure knowledge retention.	- The 10-Step Road Map: Focuses on sharing explicit knowledge through skills, relationships, and meanings. - Community of Practice Approach Model: Transfers knowledge using various techniques and tools. - Knowledge Lifecycle Model: Includes capturing, codifying, and sharing knowledge for usage. - Technological Integration Model: Facilitates KM by incorporating new technologies and supporting knowledge exchange within informal communities. Contribution of the Proposed Model: Suggests developing knowledge repositories as organizational memory. Proposes succession plans for knowledge transfer, particularly for new hires. Includes a knowledge transfer process considering the source and recipient, as well as storage methods.
6. Knowledge Application and Use: Makes explicit knowledge available for collective decision-making and evaluates the company's strategic knowledge. It can also be used to adapt the organization to changes.	- The 10-Step Road Map: Encourages knowledge application and sharing. - Organizational Culture KM Model: Uses yellow pages, learning communities, and assistance meetings to involve employees in knowledge application. - Humanist Vision KM Model: Includes application, evaluation, control, and security of knowledge. Contribution of the Proposed Model: Suggests specific methods and processes for knowledge application. Proposes potential commercialization of organizational knowledge and consulting services
7. Knowledge Auditing and Evaluation: This involves ongoing monitoring and control of the model's results, including knowledge capture, creation, storage, and transfer. Internal organizational monitoring uses lessons learned to analyze valuable knowledge and identify obsolete knowledge for unlearning and relearning. Results are compared to knowledge objectives.	- The 10-Step Road Map: Audits the KM model post-deployment and evaluates results by measuring ROI, focusing solely on this indicator. - Process-Based KM Model: Evaluates internal indicators. - Humanist Vision KM Model: Conducts monitoring and confirmation measurements according to defined objectives. - Organizational Culture KM Model: Develops indexes to measure KM's impact but does not specify key indicators. Contribution of the Proposed Model: Proposes the ability to learn and unlearn by reviewing and controlling all phases. Includes a plan with activities, responsibilities, and indicators to evaluate the model's impact on the organization.

Source: *the authors*

A clear added value is evident in each of the proposed phases, as they align with the organization's ongoing knowledge development and innovation activities. These phases integrate tools, techniques, and methods across all organizational levels.

The proposed KM model incorporates a series of stages grounded in various theoretical frameworks of knowledge and its management. It emphasizes knowledge creation and transfer as social actions performed by individuals acting collectively, generating new ideas and solving problems [32]. Tacit knowledge can, in some instances, become explicit, suggesting that the knowledge required to perform a task is partly explicit and partly tacit.

The proposed model is based on the premise that KM involves phases that facilitate the transformation and innovation of information and intellectual assets, thereby creating greater value for the organization. KM has significant positive effects on organizational outcomes, including product quality, increased productivity, cost reduction, enhanced efficiency, improved decision-making, error reduction, customer satisfaction, and effective delegation of responsibilities [33].

The model also seeks to leverage various mechanisms for sharing knowledge, such as intranets, portals, email, websites, and chats. Push technologies can be employed to establish programs for selectively disseminating the required information to beneficiaries. Additionally, repositories and databases play a crucial role in organizing and storing knowledge. The model aims to ensure future success through the development of new knowledge and technologies, fostering incremental innovation that transforms the organization's products and services.

As seen, the proposed model integrates insights and experiences from other models and theories. However, its most distinctive feature is its innovative approach to each phase, tailored to the organization's specific needs and culture

4. CONCLUSIONS

Implementing a KM model in an organization requires starting with its organizational culture, as this encompasses practices and habits unique to each company. Statistical analysis revealed that the organization already engages in some KM practices, such as meetings that facilitate knowledge sharing,

information exchange, and discussions of best practices and suggestions.

In terms of human capital, employees are motivated and possess the necessary competencies to perform their tasks. A positive attitude and corporate values were also highlighted. Regarding structural capital, product ownership and some innovative processes are maintained; however, there is room for improvement, particularly in providing incentives and resources for innovation. In relational capital, the organization has strong client relationships, though more effective management of requests, complaints, and suggestions is needed.

Knowledge utilization and application involve activities such as idea generation through teamwork and autonomous decision-making responsibilities. Knowledge creation activities are promoted, and processes are standardized. However, partnerships and alliances need to be further developed.

The proposed KM model consists of seven phases or stages, informed by data from the organization and other models, with a particular focus on the software industry. The phases include:

1. Awareness and training: Educating staff to foster essential knowledge and active participation.
2. Alignment with organizational strategy: Ensuring the model is effectively applied and aligned with the organization's goals.
3. Identification of key knowledge: Determining the critical knowledge required for the organization's operations.
4. Knowledge generation and capture: Leveraging internal and external sources, as well as tools and techniques, to generate and manage critical knowledge, which is then stored and transferred.
5. Storage and transfer: Developing a methodology to ensure timely dissemination and secure storage of knowledge for accessible use.
6. Application and use of knowledge: Facilitating knowledge application to optimize processes and support collective decision-making with explicit knowledge.
7. Knowledge audit and evaluation: Monitoring and controlling outcomes, focusing on knowledge creation, capture, and transfer effectiveness.

The KM model was validated by two experts and the organization itself. Recommendations included integrating feedback into the model, ensuring sustainability through phase-driven processes starting with awareness, and disseminating knowledge across all levels using various tools and methods.

The proposed model contributes to both theoretical and practical knowledge in KM. Socially, it offers a way to integrate the environment by enabling the company to solve problems and streamline processes, enhancing competitiveness, productivity, and work quality. Theoretically, it provides a methodology that synthesizes diverse knowledge and experiences from companies and authors in KM, serving as a valuable resource for software development companies.

REFERENCES

[1] H. Perea Alfaro, «Implementación de la gestión del conociiento en la empresa,» CEGESTI. Éxito Empresarial, vol. 1, nº 135, pp. 1-6, 2011. Disponible. https://www.cegesti.org/exitoempresarial/publicaciones/publicacion_135_310111_es.pdf.

[2] E. Cuspoca-Chaparro, L. L. I. . Melo -Torres y J. I. Mesa-Mojica, «Propuesta de una red de gestión del conocimiento para la industria de la "Gulupa" en Colombia,» Respuestas, vol. 29, nº 1, pp. 63-87, 2024.

[3] I. Nonaka y H. Takeuchi, The Knowledge Creating Company., New York: Oxfor University, 1995. Disponible en: https://www-emerald-com.ezproxy.unal.edu.co/insight/search?q=The+role+of+knowledge+management+in+the+space++%09industry%3A+important+or+superfluous&showAll=true.

[4] W. Miller y L. Morris, «4th Generation R&D ± Managing Knowledge, Technology, and Innovation.,» International marketing Research, vol. 43, nº 1, pp. 1-7, 1999.

[5] D. Montoya-Quintero, J. García-Marín y S. J. Moreno-Jimenez, «Modelo conceptual de gestión del conocimiento basado en el relacionamiento de Normas ISO,» AiBi Revista de Investigación, Administración e Ingeniería, vol. 10, nº 1, pp. 59-69, 2022.

[6] T. Davenport, «Knowledge management and the broader firm: strategy, advantage, and performance.,» Knowledge Management Handbook, vol. 2, nº 1, pp. 1-2, 1999.

[7] K. Wiig, «Introducing Knowledge management into the enterprise.,» Knowledge Research Institute, vol. 1, nº 1, pp. 1-47, 1999.

[8] D. Decarolis y D. Deeds, «The impact of stocks and flows of organizational knowledge on firm performance: an empirical investigation of the biotechnology industry.,» Strategic Management Journal, vol. 20, nº 10, pp. 953-968, 1999.

[9] E. Galvis, M. González y J. Sánchez, «Procesos de gestión de conocimiento en la industria de software: un estudio exploratorio en cuatro empresas en Colombia,» Espacios, vol. 39, nº 37, pp. 4-15, 2018.
[10] J. Morse, «Approaches to quantitative methodological triangulation.,» Nursing Research, vol. 40, nº 1, pp. 120-123, 1991.
[11] U. Chávez, D. Olvera y R. Romero, «Gestión del conocimiento en procesos de desarrollo de software.,» de XVII Congreso Internacional de Contaduría, Administración e Informática. , México, D.F. UNAM, 2012.
[12] M. Váldes, G. Díaz y M. Quintana, «El conocimiento organizacional como valor indispensable en la realidad actual de las organizaciones. Estudio para una propuesta de implementación del conocimiento organizacional y su gestión en empresas gastronómicas,» Gestión Joven, vol. 20, nº 1, pp. 51-68, 2019.
[13] C. Marulanda, M. López y J. Castellanos, «La cultura organizacional y su influencia en las buenas prácticas para la gestión del conocimiento en la Pymes de Colombia,» AD-Minister, vol. 29, nº 1, p. 163, 2016.
[14] M. Bellinza, N. Guerrero, S. Colón y W. Ramírez, «Gestión del conocimiento aproximaciones teóricas,» Clío América, vol. 5, nº 105, pp. 257-271, 2011.
[15] J. Acosta, M. Longo y A. Fischer, «Capacidades dinámicas y gestión del conocimiento en nuevas empresas de base tecnológica.,» Cuadernos de administración, vol. 26, nº 47, pp. 35-62, 2013.
[16] J. Angarita López, M. Delgado Montes y J. M. Garcia Mogollón, «Diseño de aplicación móvil para gestión del talento humano en la empresa Frigorífico Chiquinquirá S.A.,» RCTA, vol. 2, nº 40, pp. 15-29, 2022.
[17] V. De Freitas y G. Yáber, «Modelo holístico de sistema de gestión del conocimiento para las instituciones de educación superior.,» Revista Venezolana de Información, Tecnología y Conocimiento, vol. 11, nº 3, pp. 123-154, 2014.
[18] O. Calvo, «La gestión del conocimiento en las organizaciones y las regiones: una revisión de la literatura,» Tendencias, vol. 19, nº 1, pp. 140-163, 2018.
[19] F. Rodríguez-Fonseca, H. F. Castro-Silva y C. A. Dávila- Carrillo, «Análisis de modelos de gestión del conocimiento,» Mundo Fesc, vol. 11, nº S6, pp. 156-171, 2021.
[20] D. Rodríguez, «La creación de gestión del conocimiento en las organizaciones educativas: Barreras y Facilitadores. Un estudio multicaso [Tesis doctoral],» Universidad Autónoma de Barcelona, Barcelona, 2009.
[21] M. Soto y N. Barrios, «Gestión del conocimiento. Parte I. revisión crítica del estado del arte,» Acimed, vol. 14, nº 2, pp. 1-43, 2006.
[22] R. Bustelo y I. Amarilla, «Gestión del conocimiento y gestión de la información,» Revista PH. Boletín del Instituto Andaluz del Patrimonio Histórico, vol. 34, nº 1, pp. 1134-1153, 2001.
[23] C. Durango y J. Quiroz, «Evaluación de la madurez de la gestión del conocimiento en grandes empresas de Colombia: modelo exploratorio,» Pensamiento y gestión, vol. 43, nº 1, pp. 39-65, 2017.
[24] B. Tejedor y Á. Aguirre, «Proyecto Logos: Investigación relativa a la capacidad de aprender de las empresas españolas,» Boletín de estudios económicos, vol. 63, nº 164, pp. 231-249, 1998.
[25] J. Firestone, «Estimating benefits of knowledge management initiatives: concepts, methodology, and toolds,» Journal of knowledge and Innovation, vol. 1, nº 3, pp. 13-27, 2001.
[26] B. Mishra y U. Bhaskar, «Knowledge Management Process in Two Learning Organisations,» Journal of Knowledge Management, vol. 15, nº 2, pp. 344-359, 2011.
[27] P. Olla y J. Holm, «The role of knowledge management in the space industry: important or superfluous?,» Journal of Knowledge Management. Volumen. 10, Número. 2, 3-7. , vol. 10, nº 2, pp. 3-7, 2006.
[28] W. Lam y Y. Chua, «Knowledge outsourcing: an alternative strategy for knowledge management.,» Journal of knowledge management, vol. 13, nº 3, pp. 28-43, 2009. https://www-emerald-com.ezproxy.unal.edu.co/insight/search?q=Knowledge+outsourcing%3A+an+alternative+strategy+for++%09knowledge+management&showAll=true.
[29] D. Liberona y M. Ruíz, «Análisis de la implementación de programas de gestión de conocimiento en empresas chilenas,» Estudios Gerenciales, vol. 29, nº 151, pp. 151-160, 2013.
[30] E. Galvis, M. González y J. Sánchez, «Procesos de gestión de conocimiento en la industria de software: un estudio exploratorio en cuatro empresas en Colombia,» Espacios, vol. 39, nº 37, 2018.

[31] I. Parra, Los moernos Alquimistas, Medellin: Fondo Editorial Eafit, 2004.
[32] J. Jasso y A. Torres, «La gestión del conocimiento en las empresas y organizaciones: el dilena de la absorción, creación, resguardo y aprendizaje,» Sciences de Gestión, vol. 6, nº 6, pp. 285-302, 2008.
[33] J. Tari y M. García, «¿Puede influir la gestión del conocimiento en los resultados empresariales?,» Cuadernos de gestión, vol. 13, nº 1, pp. 151-176, 2011. http://biblio.uptc.edu.co:2304/ehost/pdfviewer/pdfviewer?vid=22&sid=c70a8c4e-fbd2-4507-946e-f9648d163da6%40sessionmgr4006.