

Enhancing the Colombian Public Sector Performance: A Systemic Knowledge Management Strategy Based on ISO 30401 and the IPMM

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<https://doi.org/10.34190/ejkm.24.1.4083>

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Abstract: Knowledge management (KM) is recognized as being vital for organizational competitiveness and sustainability for both private and public organizations. A great myriad of theories, frameworks, and tools have been developed, many of which have been developed with private organizations in mind, given their dependence on maintaining competitiveness in the market for their survival. However, the stakes for public organizations could be considered greater, as their decisions and actions affect a wide range of stakeholders, and their management, in general, faces important challenges, such as the high turnover of their employees. For this reason, numerous efforts have been made to improve the way knowledge is managed in public institutions, yet its effective implementation in public entities remains a challenge. In Latin America, one of the countries where explicit efforts have been made to foster KM in public institutions is Colombia. The country has developed an Integrated Planning and Management Model (IPMM), which includes a specific mandate for KM implementation in all the public institutions of the country. Although the IPMM includes this KM mandate, Colombian public entities have been facing several difficulties in achieving the KM implementation. In fact, KM adoption has been slow and its impact limited, signalling the need for systemic solutions. This research employs a systemic approach, grounded in the ISO 30401 standard and a comprehensive literature analysis, to develop a KM implementation strategy tailored to the IPMM. The proposed strategy, emphasizing strategic, human, and operational factors, positions KM as the central organizing principle of the IPMM and, at the same time, is aligned with ISO 30401 guidelines. This integration aims to ease the implementation of KM within a KM system that leads to enhancing the performance of public entities in Colombia. Although being developed for Colombian public entities, the proposed strategy offers valuable insights for public administrations globally seeking to leverage KM for strategic advantage to better fulfil their mandates for the benefit of society as a whole.

Keywords: Knowledge management, Public sector, System approach, Knowledge standards, ISO 30401, Colombia

1. Introduction

Organizational knowledge (OK) is widely recognized as a driver of enhanced performance and process quality, contributing to cultural, economic, and technological advancements (Wiig, 2002; Iman and Fatheia, 2019). Knowledge management (KM) thus serves as a critical differentiator for organizations, both public and private, fostering competitiveness and sustainability. In the case of public organizations, the role of public administration (PA) is underscored by Bueno et al. (2004), who emphasize its part in safeguarding and enhancing the well-being and quality of life of citizens. Consequently, the management of OK becomes crucial in preserving and enhancing collective intellectual capital and maintaining the economic foundations necessary for societal progress and well-being.

However, KM in public administration faces several challenges. For Fergusson et al. (2013), the managerialist perspective of KM that predominates in the Public Sector - PS, over modern practice-based perspectives, affects the innovation and effectiveness of public services. Other studies, such as the one of Mittelstädt (2025), which focuses on European Members of Parliament, finds that organizational and cultural impediments significantly

hinder the efficacy of knowledge-based activities within parliamentary settings. Specifically, the extant technical and human capital proves inadequate for facilitating comprehensive and transparent knowledge dissemination. Moreover, ideological dispositions, professional ambitions, and electoral considerations introduce further complexities. Mittelstädt (2025) concludes that the absence of a structured KM framework has resulted in resource scarcity and a deficiency of specialized expertise, thereby hindering the effective processing and utilization of the substantial volume of information generated daily. In the same vein, McEvoy, Ragab and Arisha (2017) posit that the PS faces the challenge of developing “a comprehensive strategy and approach” (p. 45) in relation to KM, as well as “to overcome the cultural barriers that permeate its hierarchies by promoting teamwork, reducing bureaucracy decision making, and increasing value management” (p. 45). Similarly, Freitas (2017) argues that “the greatest challenge for public administration is to develop systematic practices to meet new social demands for public goods and services” (p.431), driven by the need for greater competence, performance standards, monitoring, flexibility, and a focus on results and accountability.

As it is shown, the PS, as one of the largest producers and consumers of OK (Wiig, 2002), encounters unique challenges. In developing countries, these challenges are exacerbated given the resource constraints and the political, economic, and social factors that often hinder progress (Ndiege and Backhouse, 2023). In fact, while Schutte and Barkhuizen (2015) state the importance of knowledge sharing for local government institutions, according to Ali et al. (2016), the bureaucratic structure typical of the sector, where OK is perceived as a source of power, may inhibit the sharing of information and knowledge, and conduct to a “knowledge hiding” behaviour (Connelly et al. 2012, p. 65), which highlights the need for effective KM systems in the PS. Furthermore, McEvoy, Ragab and Arisha (2018) propose a taxonomy of KM in the PS, where several key aspects are included: Accountability, Government Intervention, Insularity, New Public Management, Culture, and Security & Provisioning, all of which pose different challenges for the management of knowledge in the PS.

In Latin America, research on KM is limited (Ndiege and Backhouse, 2023), particularly, in the PS, compared to its private sector counterpart (Mc Evoy et al, 2018). Colombia has sought to address this gap by establishing the Integrated Planning and Management Model (IPMM) in 2017. The IPMM provides guidelines for institutional planning and management at the national and territorial levels, aiming to improve the quality and coverage of public services. Comprising seven dimensions and 19 policies (Administrative Department of the Civil Service - DAFP, 2023), one key dimension is Knowledge and Innovation Management which seeks to “generate and document strategic information in an organized and systematic manner to manage knowledge, learn to improve practices, and adapt to changes more effectively” (DAFP, 2020a, p.15).

Despite these efforts, Galindo (2019) identifies persistent challenges related to KM in the Colombian PS. These include difficulties in knowledge transfer, insufficient competence among officials, and knowledge loss due to staff turnover. These issues hinder continuous improvement, adaptation to environmental changes, and the achievement of strategic objectives. In response, the DAFP has developed several tools to guide the implementation of KM, such as the IPMM Operational Manual (DAFP, 2021), KM Guidelines (DAFP, 2020a), and the Guide for Implementing KM within the IPMM framework (DAFP, 2020b). In addition, in 2018, the International Organization for Standardization (ISO) introduced the ISO 30401 standard, “Knowledge Management Systems – Requirements,” aimed at helping organizations establish management systems that promote value creation through OK (ISO, 2018). This standard outline minimum management principles and requirements to serve as a guide for organizations wishing to optimize the value of their knowledge. However, data from recent KM assessments, collected via the Single Management Report and Progress Form – FURAG (For its initials in Spanish) (DAFP, 2023a) from 3363 Colombian territorial entities, reflect limited compliance: 40.0% in 2022 and 35.7% in 2023. These results indicate that the practical implementation of KM remains insufficient, potentially affecting decision-making, institutional improvement, and performance outcomes.

The documents published by the DAFP to support the implementation of KM in Colombian public entities are perceived as theoretical, fragmented and incoherent, despite sharing a common structure. The analysis of these documents reveals the absence of the systemic and integrative approach advocated by the ISO 30401 standard and do not adequately address the strategic, human and operational factors of an integrated management system (Bautista-Rodríguez, Peña and Pérez, 2023), essential for build and integrate effective management systems into practice.

Hence, there is a recognized need for an integrated approach to the implementation of KM in public administration. A mixed-methods approach is employed, building on the findings of previous research that examined the convergence between the IPMM and ISO 30401 (Gutiérrez Vargas, 2023). Finally, a strategy is proposed to facilitate the understanding and practical implementation of KM in Colombian PS entities.

2. Theoretical Framework

In this section we describe the theoretical bases of this work, especially the KM general concept, with a focus on its application to public entities, including the ISO 30401:2018 Standard and the Integrated Planning and Management Model (IPMM), proposed for the Colombian PS. The different concepts included in this section are presented in figure 1.

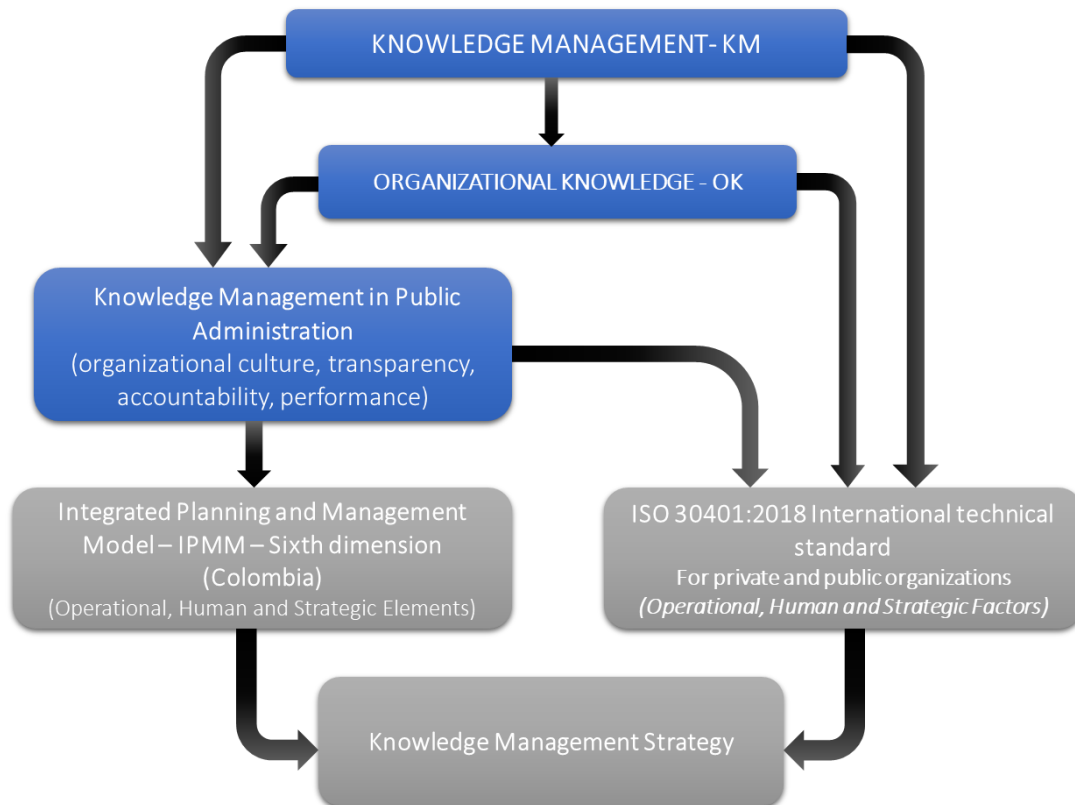


Figure 1: Concepts included in the theoretical framework

2.1 Knowledge Management

The literature on KM is vast, and an exhaustive analysis is beyond the scope of this study. For this work, a review of the basic relevant literature was performed to illustrate the fundamental concepts in this field, starting by the concept of knowledge, including the knowledge management – KM notion and reviewing some standards on KM. KM is generally recognized as “a systematic and organized approach to improve the organization’s ability to mobilize knowledge to enhance decision making, take actions and deliver results in support of the underlying business strategy” (Sheng-hsun and Huang-pin, 2005, p. 354), KM emphasizes Organizational Knowledge, OK, not just as individual knowledge, but as collective knowledge, to ensure that OK benefits business strategy.

2.1.1 Organizational knowledge (OK)

According to the international standard ISO 30401 (2018), knowledge is defined as “an asset of a human being or an organization that enables them to make decisions and execute effective actions in a given context” (p.12). This definition underscores the dynamic nature of knowledge and its direct relevance to decision-making and action, aligning with the process-oriented approach advocated in this study. As we are interested in public institutions, the concept of organizational knowledge (OK) must be reviewed.

Davenport and Prusak (1998) define organizational knowledge (OK) as “a fluid mix of experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information” (p. 5). This highlights the complexity of OK and the necessity of managing its development within organizations. Sveiby (2001, p.1) similarly describes OK as “the art of creating value by strengthening intangible assets.” He emphasizes the importance of viewing the organization as a network of knowledge and knowledge flows, which generate economic value. Nonaka et al. (1998) further characterize OK

as "a human and dynamic process of justifying personal beliefs in the pursuit of truth" (p.7). It's important to note that the justification of beliefs is critical to the transformation of tacit knowledge into explicit knowledge, a fundamental aspect of KM. This last concept, KM, has been defined by Cong and Pandya (2003) as "An ability of an organisation to use its collective knowledge through a process of knowledge generation, sharing and exploitation enabled by technology to achieve its objectives" (p. 27).

2.1.2 Knowledge management in public administration

KM in public administration has gain interest among researchers, focusing on specific settings, or the way KM can improve efficacy, and even identify barriers for managing knowledge. KM in the context of the PS, is essential for "improving renewal processes" (For Edge, 2005, p. 45) and "increasing efficiency in all areas" (McAdam and Reid, 2000, p.328). It also supports public participation in decision-making, builds social intellectual capital, and fosters a workforce capable of knowledge production (Wiig, 2002).

Despite the recognised importance of KM for the PS, research on KM in the PS remains fragmented, focusing primarily on KM as a process, its practices, its relationship with strategy and information technology, innovation in OK, and personal and organizational learning or focus their attention on specific organizations within the PS. An example of the latter is Boyer (2016), who centres his attention on KM for Public-Private Partnerships and proposes a KM Approach for Public-Private Partnerships centred mainly on learning, including training and experiential learning, networks, and the use of external knowledge, including the absorptive capacity of public organizations.

Regarding KM processes, several studies emphasize the importance of organizational culture, transparency, accountability, and the enhancement of organizational performance and competitiveness in KM processes (Vyas, Bhala and Najneen, 2020; Ngoc-Tan and Gregor, 2019; Kudryavtsev and Sadykova, 2019; Laihonon, Kork, and Sinervo, 2024); while others show some aspects that may hinder KM in PS (Borgia, et al., 2024). For example, Borgia, et al. (2024), studying the Italian PS, found that knowledge-hiding behaviour increases as work-related experience and health conditions increase, decreases as similar industry experience and skills increase; and is related to gender, as women show higher knowledge-hiding behaviour scores than men. Conversely, Hamblin et al. (2024) suggest that Organizational Ambidexterity (OA) has the potential to improve the performance of public administrations (PAs) by enabling them to effectively manage inherent tensions and competing pressures, thereby enhancing their capability to create public value and address various service delivery challenges. Additionally, the significance of Knowledge Management Systems (KMS) established by ISO (ISO 9001:2015 and ISO 30401:2018) for organizational management models is well recognized (Kudryavtsev and Sadykova, 2019).

Regarding, KM practices, Laihonon and Kokko (2020) contend that governance mechanisms significantly affect these practices, and that institutional complexity must be accounted for to address the competing and contradictory logics present in the PS (p.10). KM, therefore, must be integrated into broader organizational management and proposed as a strategy centred on the organization's processes (Kudryavtsev and Sadykova, 2019; Massaro, Dumay and Garlatti, 2015). This requires strong political support and leadership that fosters a culture valuing knowledge sharing and management (Sharif et al., 2021; Laihonon and Kokko, 2020).

However, Latin America is "almost ignored" in KM research on PS organizations (Massaro, Dumay and Garlatti, 2015, p.13). In the Colombian PS, KM is defined by the DAFP (2021) as a process through which actions, mechanisms, or instruments are implemented to identify, generate, capture, transfer, appropriate, analyse, evaluate, disseminate, and preserve knowledge. The objective is to strengthen public management, foster innovation, and improve the provision of goods and services to stakeholders (p.102). Nevertheless, several challenges to KM application in the PS persist, including cultural resistance to change, knowledge hoarding (Sveiby and Simons, 2002), incompatible information systems, hierarchical and bureaucratic structures, and a disconnect between KM and management strategy (Behn, 2003; Liebowitz and Chen, 2003).

2.1.3 Integrated planning and management model (IPMM)

The evolution of the concept of Public Administration (PA) into Public Management (PM) reflects a shift toward an approach based on effectiveness and efficiency, where citizen participation plays a crucial role in legitimizing modernization efforts (De la Garza, Yilán and Barredo, 2018). In Colombia, this shift led to the establishment of a governance framework through Decree 1082 of 2012, which aimed to integrate various initiatives in response to the new Political Constitution of 1991. These initiatives, designed to improve administrative management and the quality of services provided to citizens, were consolidated within the Integrated Planning and Management Model (IPMM). Decree 1499 of 2017 further updated the IPMM to enhance the integration of the Management System with the Internal Control System, with the goal of "directing, planning, executing,

monitoring, evaluating, and controlling the management of public entities" (DAFP, 2023, p.18). This update also extended the model's scope to include national and territorial entities.

The IPMM encompasses seven operational dimensions that align with institutional objectives: Human Talent, Strategic Direction, Management with Values for Results, Evaluation of Results, Information and Communication, KM, and Internal Control. These dimensions are deployed through 19 policies (DAFP, 2023). As the governing body of the IPMM, the Administrative Department of Public Function (DAFP) has developed a range of mechanisms and tools to guide public servants in applying the model. These resources include the Operational Manual and its annexes (DAFP, 2021), technical documents, and the Unified Management Progress Report (DAFP, 2023a).

The sixth dimension of the IPMM, Knowledge and Innovation Management, highlights the importance of preserving and sharing the knowledge of state entities in order to streamline public policy, facilitate learning and adaptation to new technologies, interconnect internal knowledge, and promote good management practices. It also transversally strengthens the other dimensions of the IPMM by seeking to enable entities to improve their management and learn about themselves and their environment through the generation, capture, evaluation, and distribution of the knowledge they produce. (DAFP, 2020b, p. 7).

2.1.4 ISO 30401:2018 standard

The International Organization for Standardization (ISO) introduced the ISO 30401:2018 technical standard, which outlines minimum requirements for KMS. This standard emphasizes that OK is an intangible, complex asset created by people, and it underscores the importance of organizational culture in effective KM (ISO, 2018, p.12).

This standard has been studied by several authors. Pawlowsky, Pflugfelder and Wagner (2021) note that ISO 30401 takes a dynamic approach to KM, prioritizing human agency over technological solutions and emphasizing culture and leadership as key enablers of a successful KMS. However, they also point out that the standard focuses more on intra-organizational KM than on inter-organizational knowledge sharing. Similarly, Zeferino et al. (2020) suggest that ISO 30401 supports the establishment of a KMS tailored to each organization's specific needs and contributes to the overall development of KM. Carlucci et al. (2022) further argue that the standard provides "a standardized set of requirements and declarations for effective knowledge management" (p.976), generating renewed interest in KMS implementation and emphasizing the role of OK in strategic management. Schmitt (2022) highlights the process-oriented approach promoted by ISO 30401, which balances technological and human elements, fostering trust and collaboration while promoting systemic thinking to help organizations adapt to changing environments (p.971). The standard follows a structure harmonized with other ISO management systems and adopts the Plan-Do-Check-Act (PDCA) cycle, promoting continuous improvement (Alba and Jiménez, 2021).

Despite the growing interest in implementing KM according to this standard, Carlucci et al. (2022) note concerns regarding resource limitations, particularly in terms of personnel and time, which may hinder its application, especially for small and medium-sized enterprises. Interpreting and complying with the standard's requirements can also be challenging. For contributing to counteract these challenges, Bautista-Rodríguez, Peña and Pérez (2023) categorize the requirements of ISO management standards into three key factors: Strategic, Human, and Operational. The strategic factor concerns the overall governance, resource allocation, risk management, and performance evaluation of the organization. The human factor relates to organizational culture, leadership, roles, responsibilities, and communication, as well as the development of competencies. The operational factor addresses process management in relation to the value chain, documented information management, performance monitoring, and the implementation of continuous improvement actions. These factors form the foundation of the proposed approach for KM implementation.

2.1.5 Knowledge management strategy

KM literature identifies a life cycle for OK, which forms the basis for its management within organizations. Nair and Prakash (2009), as cited by Mendonça, Dos Santos and Varvakis (2022, p.4), outline five key stages in the KM process: identifying, creating, storing, sharing, and applying knowledge while Nonaka (1994) describes KM as a dynamic and continuous process of interaction between tacit and explicit knowledge. This process involves a permanent cycle of knowledge transformation through the phases of socialization, combination, externalization, and internalization (p.20).

A KM strategy, as described by Zack (1999), refers to "the balance between resources and knowledge-based capabilities required to deliver products or services superior to competitors" (p.131). Laihonen and Mäntylä (2018) offer a complementary perspective, defining a KM strategy as encompassing "valuable knowledge and the processes necessary for its acquisition, exchange, and utilization" (p.3). These authors further suggest that a robust KM strategy should address the identification of performance gaps, outline how OK can bridge those gaps, and include the selection of KM tools and initiatives. This approach is particularly critical in the PS, where transparency, networking, and citizen participation are paramount.

Schutte and Barkhuizen (2015) propose "an integrated framework for social identity theory and KM as well as local government service outcomes" (p. 138), comprising 5 interdependent premises that should be taken into account "in order to implement KM principles and achieve subsequent organisational effectiveness" (p. 138). The 5 interdependent premises are: Customer-focused KM, knowledge distribution networks, knowledge as a sharing culture, knowledge as symbolic capital and social epistemology. Furthermore, Laihonen and Mäntylä (2018) emphasize that a KM strategy must align with the organization's competitive strategy and business vision.

Consequently, numerous studies have explored the implementation of KM strategies, with particular focus on identifying Critical Success Factors (CSFs) for successful KM execution (Onofre and Teixeira, 2021; Laihonen and Mäntylä, 2018; Cahyaningsih and Sensuse, 2014). Laihonen and Mäntylä (2018) identify four critical factors for the success of strategic KM in local governments: strategic focus, integration of KM into management systems, data refinement, and data quality (p.11). Strategic Knowledge Management (SKM) can also encompass planning, organizational culture, data management, specific KM activities, and performance monitoring.

The specific elements that comprise SKM may vary across studies; however, for the purposes of this analysis, we adopt the SKM framework outlined by Laihonen and Mäntylä (2018) and the Integrated Planning and Management Model (IPMM). This framework includes a strategic approach that aligns KMS with organizational strategy, integration with existing management processes and systems, and consideration of the human aspects embedded in organizational culture, to bring the KMS to the reality of the entity's processes.

The following table presents a thematic analysis of the main aspects included in this theoretical framework (See table 1):

Table 1: Thematic analysis of the theoretical framework

CONCEPT	SPECIFIC CHARACTERISTICS	OPERATIONAL FACTOR	HUMAN FACTOR	STRATEGIC FACTOR
Knowledge Management - KM	KM emphasizes Organizational Knowledge not just as individual knowledge, but as collective knowledge, to ensure that OK benefits business strategy.	KM is a systematic and organized approach to improve the organization's ability to mobilize knowledge.	Knowledge is created by people and that it is intangible and complex	KM enhance decision making in support of the business strategy
Source:	The authors	Sheng-hsun and Huang-pin, 2005, p. 354	Barnes, 2022, p. 52	Sheng-hsun and Huang-pin, 2005, p. 354
Organizational Knowledge - OK	Organizational knowledge is dynamic in nature and directly related to decision-making and action, aligning with the process-oriented approach advocated in this study.	A fluid mix of experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information	A human and dynamic process of justifying personal beliefs in the pursuit of truth	The art of creating value by strengthening intangible assets
Source:	The authors	Davenport and Prusak, 1998, p. 5	Nonaka et al., 1998, p.7	Sveiby ,2001, p.1

CONCEPT	SPECIFIC CHARACTERISTICS	OPERATIONAL FACTOR	HUMAN FACTOR	STRATEGIC FACTOR
Knowledge Management in Public Administration	Knowledge management in public sector - PS focuses on how to improve the effectiveness of citizen services, transparency, accountability, and even identify barriers to knowledge management itself.	Governance mechanisms significantly affect KM, institutional complexity must be taken into account to address the competitive and contradictory logics present in the PS.	Challenges persist in the application of KM in PS, including cultural resistance to change, knowledge hoarding, and hierarchical and bureaucratic structures.	KM allows for the effective management of inherent tensions in the PS, thereby enhancing its capacity to create public value and address various challenges in service delivery.
Source:	The authors	Laihonon and Kokko, 2020, p. 10.	Sveiby and Simons, 2002.	Hamblin et al., 2024.
Integrated Planning and Management Model – IPMM Sixth dimensión, Colombia	A process through which actions, mechanisms, or instruments are implemented to identify, generate, capture, transfer, appropriate, analyse, evaluate, disseminate, and preserve knowledge.	Knowledge management is conceived under the "Plan, Do, Check, Act" (PDCA) cycle, whose purpose is the proper management of resources through continuous evaluation and improvement.	The culture of sharing and dissemination, to consolidate institutional memory through the preservation of organizational learning.	Knowledge management must be aligned with the entity's strategic planning to contribute to the achievement of institutional objectives.
Source:	DAFP, 2021, p. 102	DAFP, 2020b, p. 34	DAFP, 2020b, p. 44	DAFP, 2020b, p. 41
ISO 30401:2018 International technical standard	In 2018, the International Organization for Standardization (ISO) introduced the international technical standard ISO 30401, which describes the minimum requirements for KM in organizations of any nature.	The process-oriented approach promoted by ISO 30401 is highlighted, balancing technological and human elements, fostering trust and collaboration while promoting systems thinking.	ISO 30401 prioritizes human agency over technological solutions and emphasizes culture and leadership as key enablers for creating a successful knowledge management system.	The standard provides a set of generic requirements for effective knowledge management and emphasizes the role of OK in strategic management.
Source:	The authors	Schmitt, 2022, p. 971.	Pawlowsky, Pflugfelder and Wagner, 2021.	Carlucci et al., 2022
Knowledge Management Strategy	A KM strategy should address the identification of performance gaps, outline how OK can bridge those gaps, and include the selection of KM tools and initiatives, to produce knowledge and innovation for the value groups and stakeholders of the entities, through the management of the processes.	Strategic knowledge management (SKM) includes planning, organizational culture, data management, specific KM activities, and performance monitoring.	Knowledge management as a dynamic and continuous process of interaction between tacit knowledge (in people) and explicit knowledge (collective, organizational)	Critical factors for the success of strategic knowledge management in local governments are alignment with organizational strategy and the integration of knowledge management into management systems.

CONCEPT	SPECIFIC CHARACTERISTICS	OPERATIONAL FACTOR	HUMAN FACTOR	STRATEGIC FACTOR
Source:	Laihonen and Mäntylä, 2018.	Laihonen and Mäntylä, 2018.	Nonaka et al., 1994.	Laihonen and Mäntylä, 2018.

3. Materials and Methods

This research aims to design a strategy for implementing KM in PS entities, grounded in the integration of the ISO 30401:2018 standard and the IPMM. The goal is to establish a KM implementation strategy where the ISO 30401 standard serves as the central framework for aligning the IPMM. This exploratory study builds on current KM practices within the sixth dimension of the IPMM, with a descriptive approach that emphasizes the alignment between the two models. The research is structured into the following phases:

Phase 1: Bibliographic Review: A comprehensive literature review was conducted focusing on KM in the PS, the IPMM, and relevant methodologies and frameworks. This review identified the key components necessary for formulating the KM implementation strategy. The research used search terms such as “knowledge management,” “public institutions,” “Integrated Planning and Management Model,” and “IPMM” in databases like Scopus, Web of Science, SciELO, and Redalyc, filtering for studies conducted in Colombia and Latin America between 2013 and 2023. Out of 348 documents, 83 relevant studies were selected, along with grey literature from civil service resources related to the IPMM. After reviewing their thematic relevance in titles and abstracts, a final sample of 52 documents was defined. The study began with an analysis of foundational KM concepts, followed by a specific examination of KM in the Colombian PS, contributing to the theoretical framework outlined earlier. Figure 2 presents the process followed in this phase.

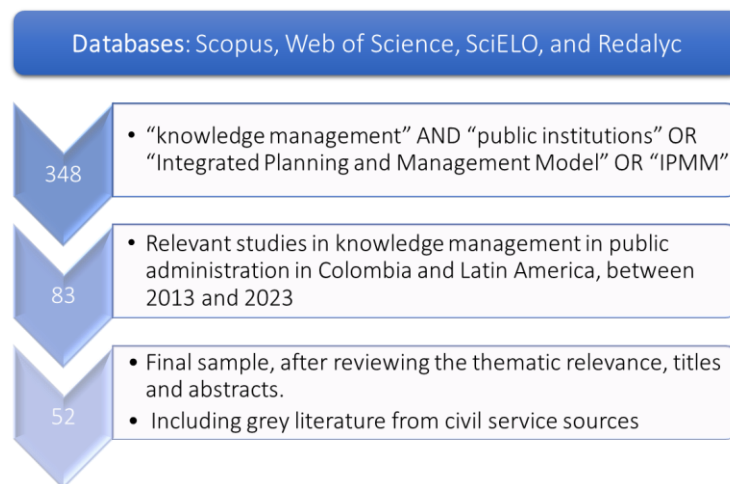


Figure 2: Bibliographic review process

Phase 2: Analysis of ISO 30401:2018 and IPMM Alignment: This phase involved identifying and analysing the articulation between the ISO 30401:2018 standard and the IPMM. The research examined 748 relationships between the two models, identifying a convergence rate of over 70% (Gutierrez, 2023). Complementary aspects, such as the use of specific tools, document management, and knowledge network promotion, were recognized. However, divergences were also identified, including the scope of Quality Management Systems (QMS), the evaluation of competencies for KM roles, and continuous improvement mechanisms.

Phase 3: Strategy Development: The final phase focused on defining a strategy that positions the systemic approach of ISO 30401:2018 as the integrating framework for the IPMM. This strategy is structured around the strategic, operational, and human dimensions, aligning with the DAFP guidelines for Knowledge and Innovation Management (KIM) and organizational process. The PDCA (Plan-Do-Check-Act) cycle is central to this approach. The strategic factors highlighted by Laihonen and Mäntylä (2018), alignment with organizational strategy, integration with other existing management systems, human dimensions embedded in the organizational culture, and a focus on practicality, underpin the proposal.

4. Results

According to Schmitt (2022), ISO 30401 promotes a KM process-oriented approach, that balances technological elements with human capabilities. The standard outlines the need to “implement, maintain, and continually improve a knowledge management system, including the necessary processes and their interactions” (ISO, 2018, p.6). It further defines a management system as “a set of interrelated or interacting elements within an organization, designed to establish policies, objectives, and processes to achieve these objectives” (ISO, 2018, p.2). This approach aligns with the guidelines set forth by the DAFP, which instructs entities to identify objectives, document existing processes, assign responsibilities, map process interrelationships, and ultimately create a comprehensive process map (DAFP, 2020, p.44-48). Additionally, the DAFP emphasizes that processes should be directly tied to the value chain, forming the foundation for an entity’s process management (DAFP, 2020, p.56). Consequently, a holistic approach to KM, one that generates value for public entities, must integrate these processes into a coherent system. As entities function as open social systems, these processes must interact to achieve shared objectives within a specific context.

Barnes (2022) notes that ISO 30401 views OK as a life cycle, encompassing the acquisition, consolidation, retention, sharing, and application of OK for decision-making, aligned with organizational objectives. Once knowledge becomes obsolete, it must be removed from the system to prevent errors or inefficiencies (ISO, 2018). In contrast, IPMM proposes a cyclical approach for the construction, maturation and dynamization of CO in the PS. This cycle, called “double cycle of knowledge and innovation management” (DAFP, 2020a, p.40), includes processes related to the creation of OK, its instrumentalization, sharing, application, evaluation, improvement and dissemination, as well as organizational learning.

Both models—ISO 30401 and IPMM—conceptualize KM as a continuous cycle, contributing to progressive improvement. However, ISO 30401 emphasizes structuring a KMS that incorporates dynamic processes to continuously renew OK (Pawlowsky, Pflugfelder and Wagner, 2021). Therefore, KM strategies must be structured around the establishment of a Knowledge and Innovation Management System (KIMS), as proposed by ISO 30401. These strategies must promote continuous cycles of KM (DAFP, 2020; Barnes, 2022) and efficient process management (Schmitt, 2022; DAFP, 2020). In addition, they must overcome the predominance of the managerialist and theoretical perspective for KM in PS, with a pragmatic approach that facilitates its effective implementation (Ferguson, Burford, and Kennedy, 2013). For these strategies to succeed, they must be aligned with the entity’s overall strategy and vision and must strike a balance between resources and capabilities (Laihonen and Mäntylä, 2018; Zack, 1999). The proposed general strategy, which positions the systemic approach of ISO 30401 as the central framework for IPMM, involves developing the strategic, operational, and human factors of SKM, following the recommendations of Bautista-Rodríguez, Peña and Pérez (2023). This strategy is in accordance with the guidelines established by the DAFP for both KIM and process management, as depicted in Figure 3.

This figure illustrates the interaction between the strategic, operational, and human factors outlined in the ISO 30401 standard. These elements align with the KM and innovation guidelines proposed by the DAFP, facilitating the implementation of the KIMS within PS entities.

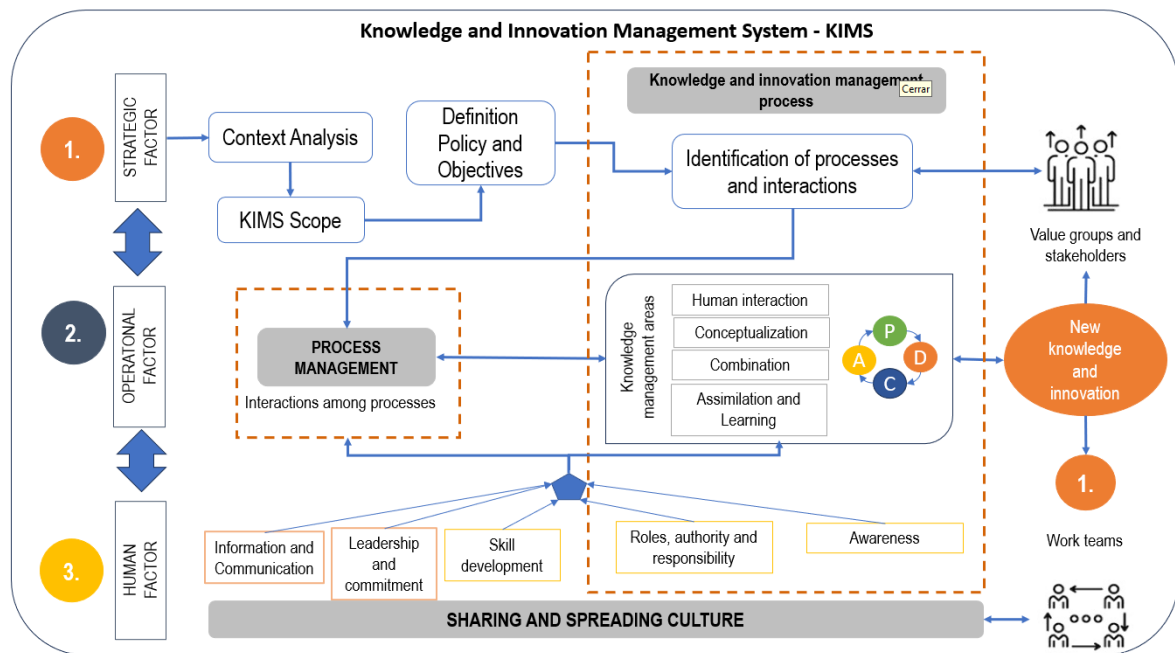


Figure 3: Knowledge and Innovation Management System in the Colombian PS

The figure shows how the requirements of ISO 30401 and DAFP guidelines converge to support practical and effective KM and innovation management, considering three key factors, which are now described.

4.1 Strategic Factor

The development of the KIMS from a strategic perspective is grounded in the following key elements:

- Contextual analysis: This involves identifying the internal and external factors that most influence knowledge management (KM) within the entity, considering the needs and expectations of both value and interest groups (DAFP, 2020b; ISO, 2018).
- Definition of scope: The scope of the KIMS is established in terms of the business processes that provide significant value to the organization and its stakeholders. This entails delineating the domains of organizational knowledge (OK) that the KIMS should prioritize (ISO, 2018).
- Strategic alignment: A strategy is formulated to guide the KIMS in alignment with the contextual analysis and institutional objectives (DAFP, 2020b). This strategy is expressed through the KM policy and objectives, which are integrated with the overall organizational strategy (Gupta et al., 2022).
- Process identification: The processes constituting the KIMS, including KM-specific processes, are identified (ISO, 2018; DAFP, 2020b). These processes, tied to the entity's value chain and daily routines, provide the operational foundation for KM activities.
- Interaction mapping: Key interactions between processes and stakeholders are recognized and linked to ensure the effective achievement of KIMS objectives and policies (DAFP, 2020; ISO, 2018).

4.2 Operational Factor

After defining the strategic components of the KIMS—context, scope, policy, objectives, processes, and interactions—the system is extended operationally into each value chain processes, to establish KM practices.

According to ISO 30401, the KIMS must incorporate specific tasks and behaviors to achieve its objectives (ISO, 2018), which include:

- Human interaction: Knowledge is exchanged and generated through daily interactions within KIMS processes.
- Conceptualization: Tacit knowledge is codified into explicit knowledge through documentation during key process moments.
- Combination: Experts formalize and structure new knowledge, integrating it with pre-existing knowledge to ensure its availability.

- Assimilation and learning: New knowledge is absorbed into routine practices through formal training and coaching activities.

Each process should identify where these four tasks are carried out, making KM an integral part of the organization's operations. This involves defining the physical or virtual spaces for KM (such as the "Ba" concept by Nonaka and Konno, 1995) and managing these spaces through the PDCA (Plan-Do-Check-Act) cycle to consolidate new knowledge (ISO, 2018). An instrument, proposed in the form of a table, would help operationalize these activities, detailing processes, tasks, KM spaces, PDCA management, and evidence of outcomes (an example is available at: <https://zenodo.org/record/8157078>).

The systematic implementation of these tasks within processes results in the creation and consolidation of new organizational knowledge. These spaces facilitate the conversion of data into actionable knowledge, supporting both problem-solving and innovation projects aimed at generating strategic knowledge that contributes to public value (DAFP, 2020b).

To further enhance KM, it is proposed that a specific process dedicated to KM be established. This process, incorporated into the entity's process map or as a sub-process, would harmonize KM efforts across the organization following the PDCA cycle. The expected outcomes include a KM diagnosis, a general implementation plan for the KMSInn policy, analysis of existing knowledge, innovation project formalization, and performance reviews (DAFP, 2020a). The KM leader, as outlined in the Human Factor section, would oversee this process.

4.3 Human Factor

The implementation of the third component of the KIMS highlights the critical role of human talent, which is emphasized in the Integrated Planning and Management Model (IPMM): "human talent is the heart of the IPMM... and central to KM and innovation implementation" (DAFP, 2020b, p. 39). ISO 30401 similarly emphasizes that "knowledge is created by people" (ISO, 2018, p. vi), underscoring the importance of leadership, role clarity, competency development, communication, awareness, and organizational culture.

4.3.1 Authority, roles, and responsibilities

The KIMS requires clearly defined roles with appropriate levels of authority and responsibility. According to DAFP guidelines (2020b), a KM leader must be appointed, supported by teams from areas such as Human Resources, Planning, ICT, and Communications.

This leader's responsibilities include advancing KM policy, guiding self-diagnosis efforts, formulating improvement plans, and overseeing performance reviews (DAFP, 2020a). ISO 30401 adds that the leader must ensure compliance with KIMS requirements and communicate relevant roles to stakeholders.

4.3.2 Competency development

Competency, defined as the ability to apply knowledge and skills to achieve expected results (ISO, 2018), is essential for KIMS operation. It is necessary to determine the competencies required by those designing and continuously improving the KIMS Human talent, especially when integrated with KM processes, facilitates the development of competencies that enable public servants to support learning and innovation (DAFP, 2020a).

4.3.3 Communication

The fifth dimension of the IPMM, Information and Communication, supports the interaction of entities with their environment throughout the management cycle, ensuring the flow of internal information between KIMS processes and external communication with stakeholders (DAFP, 2021). Clear communication, as prescribed by ISO 30401, promotes visibility and accountability within the KIMS crucial for its effective implementation.

4.3.4 Awareness

Awareness of the KIMS is essential for its effective operation. This awareness ensures that individuals understand their roles and responsibilities in achieving KM objectives (Pawlowsky, Pflugfelder and Wagner, 2021; ISO, 2018). The KM leader plays a key role in fostering this awareness through training, communication, and performance evaluations.

4.3.5 Organizational culture

A critical component of KM in public entities is the establishment of a "Sharing and Dissemination Culture", which aims to consolidate institutional memory and promote the effective use of intellectual capital within the organization (DAFP, 2021, p. 108). The ISO 30401 standard underscores that cultivating a KM culture is essential for the sustainable implementation of the KIMS and identifies key elements that shape this culture, including leadership behaviour, trust, institutional policies and procedures, incentives, training, digital environments, and technology (ISO, 2018). This also follows authors such as Schutte and Barkhuizen (2015) regarding the importance of establishing a sharing culture.

The development and reinforcement of this culture are achieved through the formalization of spaces that facilitate knowledge sharing (DAFP, 2020a). These spaces, along with organizational guidelines and leadership behaviours, serve as the foundation for fostering a culture where organizational knowledge (CO) is consciously valued and utilized. The successful integration of this culture depends on several factors, including information and communication, leadership and commitment, competency development, clear roles and responsibilities, and awareness-building initiatives. These elements are systematically integrated into the work teams responsible for managing knowledge and innovation within the entity.

DAFP (2020b) highlights the strong connection between knowledge management and innovation, noting that innovation relies on effective KM to gain a comprehensive understanding of the challenges that require innovative solutions. Furthermore, it is posited that innovation must generate new strategic knowledge for the entity (DAFP, 2020b, p. 32).

While KM typically occurs within ongoing processes and contributes to continuous or incremental improvements (García-Fernández, 2016), innovation is achieved through time-bound projects, which, supported by KM (Caccamo, Pittino and Tell, 2023), have the potential to lead to transformative changes. The "Generation and Production" axis of KM promotes the creation of new ideas through teams capable of ideating, experimenting, researching, and innovating (DAFP, 2020a). Consequently, innovation challenges identified within public entities should be approached as distinct projects, with KM processes providing the necessary data and information to support methodologies such as design thinking, which facilitates the generation of innovation.

5. Conclusions

The purpose of this research is to propose a strategy to facilitate the understanding and practical implementation of KM in Colombian PS entities. For this purpose, we developed a literature review that reveals that there are few studies on KM in PS, especially in Latin America. Ndiege and Backhouse (2023) point out that developing countries face challenges that hinder management in general, such as an unfavorable political environment, cultural aspects, poor organizational structures, and lack of leadership support, but in addition, there are specific difficulties for KM, such as the lack of KM strategies and policies and weak KM processes, along with deficiencies in information technologies.

To face these difficulties, some models, such as the ISO 30401 and the IPMM, have been proposed. Although they present some similarities, they also present differences that make their joint implementation difficult at the same organization. One of the most explicit contrasts between ISO 30401 and the IPMM, is their fundamental orientation. ISO 30401 focuses on the systematization of OK, through the implementation of a structured and standardized KMS aligned with organizational processes under the PHVA cycle (Plan-Do-Check-Act). The IPMM approach emphasizes public value and the improvement of public management, highlighting knowledge as an instrument to strengthen innovation, institutional efficiency, and service delivery. Likewise, ISO 30401 proposes a more integrated and pragmatic approach, where strategic, human, and operational factors are considered central axes of a cohesive management system. In contrast, the IPMM's technical documents, although valuable, have been described as theoretical, fragmented, and lacking a clear systemic articulation, which has hindered their practical adoption by public entities. In summary, ISO 30401 provides a robust structure for operationalizing KM from an internal perspective, while the IPMM focuses on generating impact in the public sphere. The convergence between the two models, as proposed in this research, allows strengthening the actual implementation of KM.

For defining how these two models converge, the literature review also allowed the identification of the main conceptual and theoretical bases. These bases are organized deductively, as shown in Figure 1. The thematic analysis of these bases allows recognizing similar aspects among the different levels of conceptualization (see Table 1). These aspects are consistent at different conceptual levels, showing their importance for effective KM.

Elements such as planning, data management, processes, technology, evaluation, and improvement, among others, are reiteratively present. They are linked to the operational aspects of KM. Therefore, in this research, they are denominated operational factors. The human nature of organizational knowledge is also recognized at different conceptual levels. In addition, important elements such as learning, communication, culture, and interaction, among others, are identified. These elements are included in the human factor. Additionally, it is proposed that there must be a close relationship between organizational strategy and KM to create value, achieve organizational objectives, and face the organizational challenges. This is called the strategic factor. These three factors—operational, human, and strategic—are the articulating axes of the proposed strategy.

Under this context, a systemic strategy, characteristic of the ISO 30401 model, is proposed to integrate the efforts of Colombian public entities in the real and effective implementation of KM. Figure 3 describes how to link the sixth dimension of IPMM with ISO 30401. The strategic, human, and operational factors are essential components of the KIMS, whose purpose is to produce knowledge and innovation for the value groups and stakeholders of the entities through the management of the processes of the value chain. Each process must develop four specific spaces, physical or virtual, for KM: human interaction, conceptualization, combination and assimilation, and learning. These spaces are managed according to the PDCA cycle to generate the institutional knowledge necessary for continuous improvement and to support innovation projects. According to the proposal, knowledge generation and innovation are based on a sharing and spreading culture, which emphasizes the importance of the human factor in the production of knowledge and innovation.

Further research is needed to specify methods for operating and effectively monitoring KM spaces, as well as for the creation of indicators to measure the development of knowledge and innovation in PS entities, under the proposed framework. Nevertheless, we think that this approach may offer Colombian public entities, as well as those located in other countries, the opportunity to put KM into practice, based on the proposed strategy. To verify this, further studies should be carried out, which would help overcome the limitations of the present study in terms of the lack of application cases in PS, not only in Colombian public institutions, but in other locations as well.

AI Statement: Artificial Intelligence tools were used to translate the text and verify the correctness of it.

Ethical Statement: Ethical approval was not required since this is a scoping review on extant research and grey material already within the public domain.

Funding: The authors received no financial support for the research on which this article is based. The Corporación Universitaria Minuto de Dios – Uniminuto funded the publication (APCs).

Declaration of Conflicting Interests: The authors have no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Disclosure of interest: The authors report that there are no competing interests to declare.

Data availability statement: As mentioned in the “Results” section, an instrument, proposed in the form of a table, would help operationalize the activities of Human interaction, Conceptualization, Combination, and Assimilation and learning, detailing processes, tasks, KM spaces, PDCA management, and evidence of outcomes is available at: <https://zenodo.org/record/8157078>.

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