Maximizing Synergy: The Benefits of a Joint Implementation of Knowledge Management and Artificial Intelligence Systems Standards

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Article

Maximizing Synergy: The Benefits of a Joint Implementation of Knowledge Management and Artificial Intelligence Systems Standards

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Abstract: In response to the increasing importance of knowledge as a key competitive advantage, the role of knowledge management in value creation cannot be overstated. The International Standards Organization (ISO) has recognized this and announced a Management Standard for Knowledge Management Systems (KMS). This initiative is significant because, by viewing knowledge strategically, organizations are seeking ways to enhance their processes and align them to address their challenges. A synergistic effect can be achieved when another management system highly relevant to KMS is joined and later integrated. This new system is Artificial Intelligence Management (AIMS). The paper is structured as follows: Firstly, we explore knowledge and knowledge management (KM), along with the challenges companies face in implementing and operating KM. Next, we examine the ISO 30401:2018 standard as a guide for KM implementation. Finally, we discuss how ISO 30401:2018 and ISO/IEC 42001:2023 can help solve key organizational problems and support machine learning and knowledge extraction through AI. In conclusion, we summarize the key outcomes of the paper. The main purpose of the paper is to determine how these standards contribute to solving practical problems in the creation and development of a knowledge management system supported by artificial intelligence and to demonstrate their synergistic effect when used together.

Keywords: knowledge; artificial intelligence; management systems; standards; drivers of standards implementation; ISO 30401:2018; ISO/IEC 42001:2023:2023; KMS; AIMS; AI

1. Introduction

Emerging AI capabilities, including KM, are expected to become integral to various organizational activities. Building a partnership between humans and AI can support KM activities, and understanding the implications for AI system development and management is crucial. This involves considering people, infrastructure, and processes [1].

In response to the increasing importance of knowledge as a key competitive advantage and its role in value creation, the International Standards Organization (ISO) introduced the Management Standard for Knowledge Management Systems [2]. This initiative is significant because it encourages organizations to view knowledge strategically, enhancing their processes to better address challenges. Joining and later integrating another management system relevant to KMS, such as ISO/IEC 42001:2023, can have a positive synergistic effect.

The primary purpose of this article is to address the lack of a comprehensive overview of joint implementation and, later, the integration of ISO 30401:2018 and ISO 42001:2023 [3]. It aims to determine how these standards help solve practical problems in creating and developing a knowledge management system supported by artificial intelligence (AI) and demonstrate their synergistic benefits when used together.

1.1. Knowledge and Management System

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Each organization works in a certain environment, dealing with customers, clients, suppliers, governmental and non-governmental organizations, employees, and owners.

Knowledge is a widely discussed concept in the field of strategic management because it provides a sustainable competitive advantage. Knowledge management can be analyzed from several angles: as a state of mind, an object, a process, a condition of having access to information, or a capability [4]. Additionally, it may be examined from various perspectives, such as human resources management, strategic management, IT systems management, or an integrated approach combining multiple management functions. Some authors have chosen definitions that reflect these different approaches and research perspectives in knowledge management [5].

Knowledge not only fosters the creation of new products or services but also enhances existing ones, refines business processes, and prevents repetitive and unnecessary work. Organizations aim to use knowledge to achieve their goals rather than merely acquiring and collecting it.

However, many organizations struggle to implement effective knowledge management systems and seek guidance for this process. Applying ISO 30401:2018 helps set clear purposes, define necessary actions and elements, appoint responsible individuals, and control the entire process.

Organizations often face difficulties while implementing knowledge management systems, and the reasons for failure vary. The ISO 30401:2018 standard helps avoid these mistakes and addresses the reasons for implementation failures. Additionally, the standard aims to achieve a high level of quality in existing knowledge management and to benefit from this achievement. The standard points out requirements that may be considered as guidance on managing policies and processes to achieve specific objectives and creating a culture that facilitates the continuous cycle of self-estimation, change, and improvement of organizational operations and processes [6].

To achieve these benefits, organizations need to manage knowledge effectively. The Knowledge Management System (KMS) ISO 30401:2018 comprises a set of procedures and actions designed to facilitate and improve the creation, acquisition, maintenance, and administration of knowledge within the organization. KMS helps organizations adapt to dynamic environments, minimize business risks, and enhance both personal and organizational learning and performance. Section 3.2 further explains problems organizations face using information collected through the literature review. In addition, Section 3 describes the challenges that we collected through the interview.

1.2. Artificial Intelligence and AI Management Systems

The implementation of AI in knowledge management has been conducted across various continents, mostly in the general field. AI can be applied to fundamental knowledge management processes, decision-making, knowledge forecasting, and knowledge exchanges. The implementation of AI in knowledge management is growing, and the research topic continues to develop [7].

Following are some conceptual frameworks that will help us understand the nature of this nascent technology.

AI is a branch of computer science that has been evolving since 1950. The term was first coined by the American cognitive scientist and inventor John McCarthy in a 1956 paper presented at the Dartmouth College Conference. At that time, the ambition was to create a machine that mimics the human brain's activities during the learning process. In McCarthy’s mind, by automating different learning tasks a human brain goes through, we may be able to program a machine to learn and behave in similar ways to humans.

Artificial Intelligence (AI) refers to the scientific and technical field dedicated to developing engineered systems that generate outputs such as content, forecasts, recommendations, or decisions based on human-defined objectives [8]. Haugeland [9] describes AI as the effort to create machines capable of thinking, potentially acquiring human-like abilities such as abstract thinking, emotions, feelings, and consciousness. Kurzweil [10] emphasizes AI's capability to build machines that can act and react appropriately, adapting their responses to situational demands, thus highlighting AI's intelligent behaviour. These definitions collectively suggest that AI not only aims to replicate human cognitive functions but also strives to produce systems capable of intelligent adaptation and decision-making.

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Furthermore, AI techniques offer powerful tools for developing knowledge management systems, enhancing their capability to manage and utilize knowledge effectively [11].

It is important to remind the reader of the distinction between the three types of AI. Figure 1 provides a short summary of the different types.

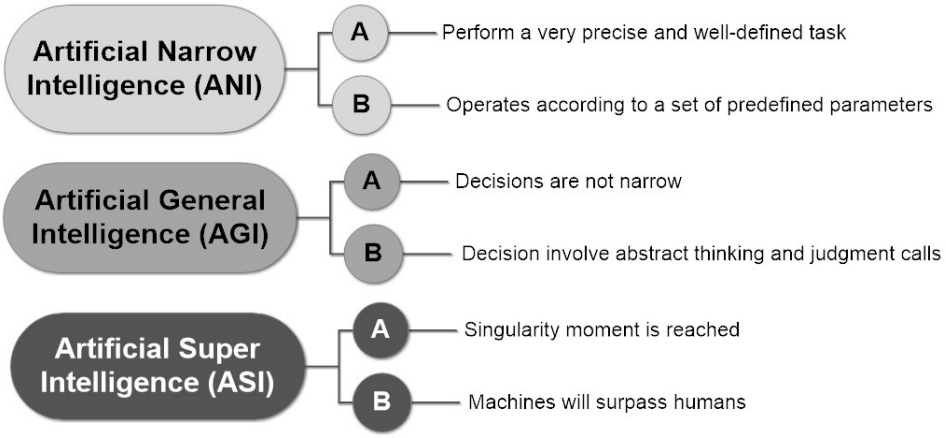

Figure 1. Different types of artificial intelligence [11].

AI is just a practical tool, not a panacea. It's only as good as the algorithms and machine learning techniques that guide its actions. AI can perform a specific task well, but it takes tons of data and repetition. It simply learns to analyze large amounts of data, recognize patterns, and make predictions or decisions based on that data, continuously improving its performance over time. This AI meaning has evolved beyond mere data processing to include the development of machines capable of learning, reasoning and problem-solving. Machine learning has become so "competent" that it generates everything from software code to images, articles, videos, and music. This is the next level of AI, the so-called generative AI, which differs from traditional AI in its capabilities and application. While traditional AI systems are primarily used to analyze data and make predictions, generative AI goes a step further by creating new data similar to its training data [12].

Because data and information are the "fuel" for artificial intelligence, effective AI implementation requires targeted data management, information processing, and correct management of the AI itself.

Applications of artificial intelligence are already revolutionizing how businesses operate. Advancements in machine learning and deep learning, in particular, are creating a paradigm shift in virtually every sector of industry. Spanning areas as diverse as healthcare, finance and information technology, AI has pioneered innovations and optimizations in numerous fields. And at the heart of it all, you will find AI management systems. With increasing integration across various industries, the importance of ensuring the quality and reliability of AI software cannot be overstated. Despite the risks involved, AI still suffers from a lack of regulation. This is where AI management systems can help.

The AI management system, as specified in ISO/IEC 42001:2023, is a set of interrelated or interacting elements of an organization intended to establish policies and objectives, as well as processes to achieve those objectives, in relation to the responsible development, provision or use of AI systems. This standard specifies the requirements and provides guidance for establishing, implementing, maintaining and continually improving an AI management system within the context of an organization [13].

Table 1 below lists some of the benefits of AI system integration.

Table 1. The main benefits of implementing an artificial intelligence management system.

Framework for managing risk and opportunities;
Demonstration of responsible use of AI;

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Traceability, transparency and reliability;
Bridging information asymmetries between partners;
Increased the level of trust and confidence among partners;
Cost savings and efficiency gains.

Using the concept of the harmonized or consolidated structure of High-Level Structure (HLS) management standards, it is possible to analyze knowledge management and AI management comprehensively [14]. This approach allows for drawing conclusions that facilitate a deeper understanding and enable the establishment, implementation, maintenance, continuous improvement, and documentation of all processes in both management systems [15].

2. Materials and Methods

The materials used in our research pertain to knowledge management, artificial intelligence management, and their respective systems. Specifically, we focused on ISO 30401:2018 – Knowledge Management Standard and ISO 4200:2023 – Information Technology – Artificial Intelligence. The methods employed included a literature review and subsequent analysis. For the standards, we conducted a synthesis of individual clauses, terms, definitions, and annexes. In addition to the literature review and standard analysis, we conducted interviews. The research targeted 30 medium-sized European organizations, each with up to 250 permanent employees. Three-fifths of these organizations were members of the European Union, while the remaining were located on the European continent but were not part of the EU. We utilized our university's and partner universities' internal databases with similar study programs. Specifically, graduates from our faculty's "Human Resource in an Industrial Enterprise" program played a crucial role in this research. The database included professional contacts of former university graduates currently employed as HR managers. After reaching out to these graduates and presenting the research, these HR managers conducted interviews with top and middle management, providing insights based on their experience and observations. This research phase lasted from December 2023 to March 2024. Interview participants identified common problems and key tasks related to implementing and maintaining knowledge management (KM) within their organizations. The collected and processed information was compiled into a table. Most data were provided electronically via emails, while others were conveyed through audio or audiovisual means via phone or online meetings.

3. Results

During the interview, we noticed that the respondents made a significant distinction between a task and a problem.

A problem was typically defined as an issue that requires immediate resolution, corrective actions, or the prevention of potential risks that have not yet occurred. In contrast, a task was a planned action where the respondent was aware of the possible implications and confident that there was enough time to address them.

Table 2 is an overview of interview questions and answers. It is important to note that the interview was conducted as an open dialogue with a combination of open and closed questions.

Table 2. Interview Questions.

1	Does your organization use knowledge management? (including adjacent disciplines)

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2	What strategies and tools do you use to manage knowledge within your organization?
3	What challenges does your organization encounter regarding knowledge management?
4	Are there plans to implement a Knowledge Management System (KMS) in your organization?
5	Are there plans to implement an Artificial Intelligence Management System (AIMS) in your organization?

All organizations responded positively to the first question. Differences emerged with the second question. 93.33% of organizations (28) reported using a combination of their own systems adapted to local conditions and ISO 9001 standard. Two organizations used their own system but were not ISO 9001 certified. However, none of the organizations used ISO 30401.

When identifying the problems faced by these organizations, we gathered responses summarized in Table 3.:

Table 3. Answers to the interview question #3.

Identified problems	Number of organizations dealing with the problem	Percentage (%)
Inconsistency of KM with general goals	20	66.67
Lack of detailed planning and timing for KM projects and infrastructure	25	83.33
Lack of understanding of the importance of KM	12	40.00
Organizational mismatch	28	93.33
Lack of knowledge sharing	15	50.0
Inefficient reward system	19	63.33
Overwhelming with irrelevant information	22	73.33
Overwhelming irrelevant persons with relevant information	23	76.67
Low understanding of the context related to the importance of adjacent disciplines, including AI	29	96.67
Absence of insight ability in KM	25	83.33

Finally, 50% of organizations confirmed future plans to implement KMS, and 97% of organizations planned to implement AIMS.

In the following sections, we will address the drivers for implementation, as well as the benefits and challenges of implementation and system deployment.

3.1. Drivers for Implementing the KM

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The organization's standards help make dealings more transparent and predictable, but the drivers for standards implementation may vary from company to company.

The drivers may be external or internal and may lead to different benefits. External drivers appear when a whole market requires changes and pushes the organization to use new technologies, approaches, and business models to stay competitive and effective. Internal drivers, on the other hand, concern internal processes, the organization's image, or strategy. The implementation benefits may be explicit or implicit and manifest themselves in the near future or with delayed effect.

Figure 2 summarizes internal and external drivers and possible implementation benefits of knowledge management standards.

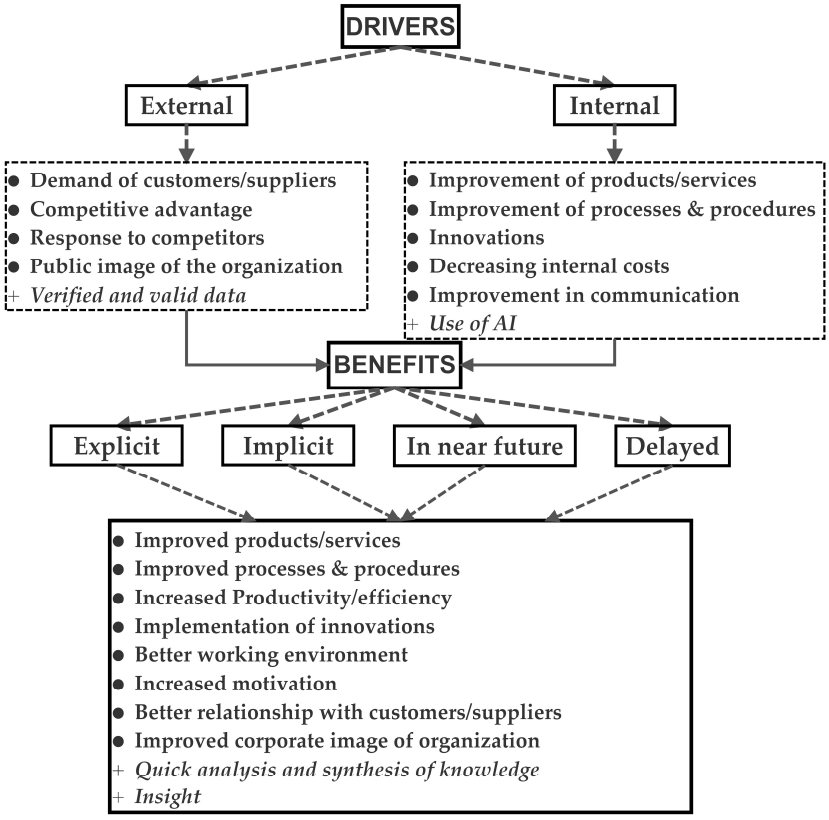

Figure 2. Overview of external and internal drivers and benefits in KMS (Author's work based on [16]).

Adopting a powerful tool that aligns with the management system and follows the latest trends is essential to enhance the benefits of using knowledge management in an organization. One such tool is the AI management system based on the ISO/IEC 42001:2023 standard. By incorporating "AI Management" into adjacent disciplines and updating Figure 2 with "+ Use of AI" for internal drivers and "+ Verified and valid data" for external drivers, organizations can achieve faster and more insightful processing of knowledge. This will result in "Quick analysis and synthesis of knowledge" and "Insight."

External drivers, internal intentions, and promising benefits encourage organizations to establish and develop knowledge management systems (KMS). Of course, the main benefit of certification is bridging information asymmetries between partners because the implemented ISO certification gives a sign to others that some managerial practices are made and function well. This increases the level of trust and confidence among partners as it indicates serious intentions of managers in doing business and consistency and stability in its functioning.

3.2. Challenges in Knowledge Management Implementation

Storey and Barnett were the first researchers to define the two key problems. The first problem dealt with the kind of interventions managers are invited to make to effect and implement a

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knowledge perspective on business strategy. The second problem touched upon some difficulties that might have been anticipated in this endeavour. [17] (p. 146). The increasing number of KM implementation failures suggests that organizations still face significant problems during implementation.

Khazieva and Caganova identified the most common problems in implementing and running KM, which are summarized in Table 4 [18].

Table 4. Most common problems during implementation and deployment of knowledge management based on literature review [18].

Inconsistency of KM with general goals. The organization should determine its general goals before developing any knowledge management system. This refers to making a profit and formulating clear, consistent, and reachable goals.
A lack of detailed planning and timing for the KM project and infrastructure. Organizations often do not indicate the deadlines, resources, working time distribution, and responsible people for implementing and running KM. An absence of special technical tools and software limits data collection and analysis.
Organizational mismatch. The organization does not explain to its employees what it assumes from them regarding KM, nor when or how it correlates with their main duties and what is expected.
Lack of knowledge sharing. Sometimes, employees are unable or unwilling to share their knowledge. The main reasons for this are protecting their own position and benefits within the organization, distrust among employees, and an unfriendly environment as a whole.
Inefficient reward system. Participation in any KM is usually an additional task for employees, and employees believe that this performance should be appropriately appreciated.

Based on the answers collected during the interview, we can confirm that the listed challenges remain consistent over time and that organizations continue to face the same problems.

Understanding these problems allows companies to take proactive steps to prevent knowledge management failures. However, analyzing potential issues and finding solutions demands significant effort and resources.

However, many organizations do not know how to start the KM process and what they need. In this sense, ISO Standard 30401 is “an opportunity to create a common language for global conversations about KM that just might help organizations manage knowledge more effectively” [19]. The main aim of this standard is “to support organizations to develop a management system that effectively promotes and enables value-creation through knowledge” [2]. This means that any KMS does not exist in isolation from the goals of the organization. KM is created and operates in accordance with the company's vision, mission and objectives. It is developed to create and increase the value of the company's products or services.

Some scholars have attempted to analyze ISO 30401:2018. Corney summarized the advantages and disadvantages of ISO 30401:2018 according to their experience in the drafting process [20]. Kudryavtsev and Sadykova studied how ISO 30401:2018 may be included in enterprise architecture models, combining knowledge management with other management systems and with technologies and IT systems in the organization [21]. Maximo et al. first visualized the standard’s structure and determined crucial strengths and weaknesses for practical implementation [4]. Pawlowsky et al.

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analyzed how ISO 30401:2018 relates to the theoretical origins of KM and Intellectual Capital research. The authors discuss how ISO 30401:2018 may contribute to value creation [22].

3.3. Knowledge Management Life Cycle

It is well-known that knowledge must first be captured, codified, and presented in a format that is accessible to the user for it to be shared. The goal is to convert knowledge into actionable insights or transform individual learning into organizational learning. This paper incorporates the life cycle into its framework.

The AI lifecycle, Figure 3, is the iterative process of moving from a business problem to an AI solution that solves that problem. Each of the steps in the life cycle is revisited many times throughout the design, development, and deployment phases.

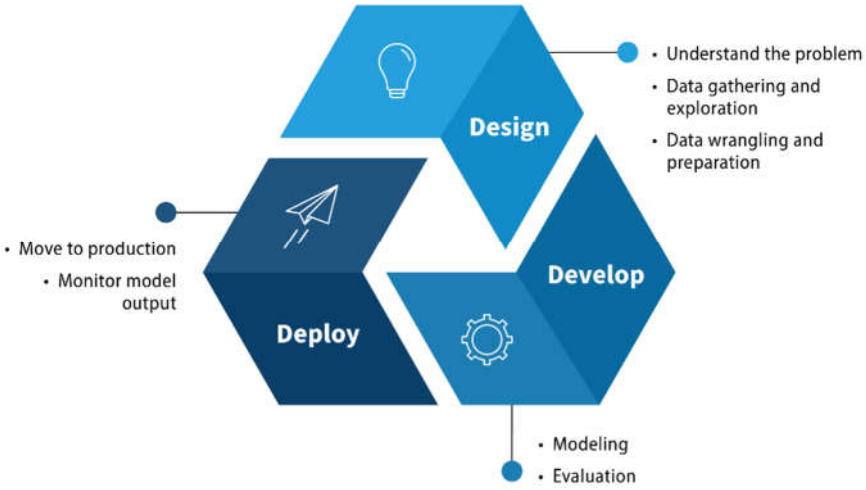

Figure 3. AI Lifecycle [23].

The life cycle is usually a prerequisite for effective knowledge transfer and sharing. Figure 4 illustrates knowledge transfer within the KM system-building life cycle according to [24].

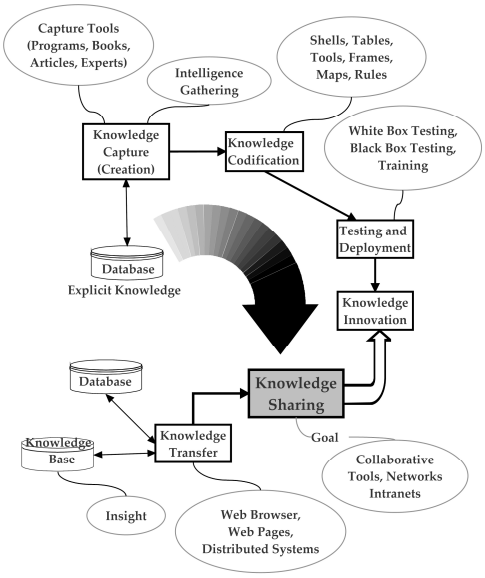

Figure 4. Knowledge Transfer in the KM System Building Life Cycle [24].

ISO 30401:2018 includes an important informative section, Annex B, titled "Relation between Knowledge Management and Adjacent Disciplines." This Annex highlights the synergy between knowledge management and other management systems. Since the standard was released in 2018, it

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does not yet include the newly developed AI management system. However, ISO 30401:2018, Annex B, outlines specific disciplines. We have extended these to include AI and summarized them in Figure 5.

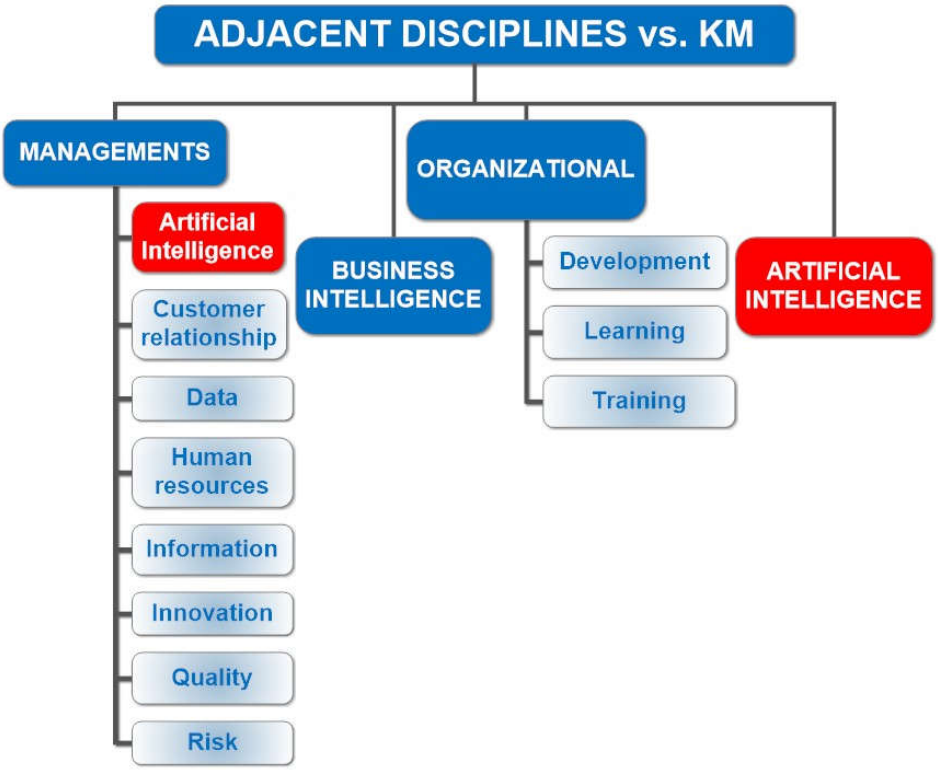

Figure 5. Relationship between knowledge management and adjacent disciplines (author's work inspired by Annex B, [2]).

Determining the close connections between knowledge management and artificial intelligence management and their presentation, the following ideas emerge, which point to the synergistic effect between these two disciplines.

The life cycle of Knowledge Management (KM) is intricately linked with Artificial Intelligence (AI) alongside other adjacent disciplines. From our model, several key conclusions emerge. First, no AI solution can succeed without a clear and precise understanding of the business challenge being addressed and the desired outcome. Second, data is the foundation of any AI solution; a model cannot be utilized effectively without a thorough comprehension of the required data and its composition. Lastly, data preparation often proves to be the most challenging and time-consuming phase of the AI lifecycle.

Organizations often struggle to implement knowledge management (KM) systems effectively, seeking guidance and recommended steps for the process. Applying the ISO 30401:2018 standard helps to set clear purposes, determine necessary actions and elements, appoint responsible individuals, and control the entire process.

The implementation of KM systems is challenging for many organizations, leading to failures for various reasons. The ISO standard helps to avoid mistakes and address these reasons during KM system implementation. Additionally, it aims to achieve a high level of quality in existing KM practices and benefit from this achievement. Companies frequently lack clarity on where to start and the desired outcomes. In this context, applying established standards like ISO 30401:2018 can help eliminate the challenges and difficulties associated with KM implementation. The standard points out requirements that may be considered as guidance on managing policies and processes to achieve specific objectives and creating a culture that facilitates the continuous cycle of self-estimation, change, and improvement of organizational operations and processes [6].

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3.4. ISO 30401:2018 and ISO 9001:

ISO 30401:2018 has a format and structure comparable to ISO 9001:2015, where organizational knowledge is part of quality management. During the interview, the organizations identified the parts of ISO 9001:2015 that were most often used in their knowledge management implementation process, Table 5.

Table 5. Overview of identified ISO 9001: 2015 clauses for KM implementation [25].

Clause number	Clause
4.1	Understanding the organization and its context
4.2	Understanding the needs and expectations of interested parties
5.1.2	Customer focus
5.3	Organizational roles, responsibilities and authorities
7.1.2	People
7.1.6	Organizational knowledge
7.2	Competence
7.3	Awareness
7.5.2	Creating and updating (documented information)
7.5.3	Control of documented information
8	Operation (selective)
9.1.2	Customer satisfaction
9.1.3	Analysis and evaluation
9.3	Management review

Both standards have some similarities and differences in relation to their objectives. Table 6. notes the most significant similar parts.

Table 6. Overview of common characteristics ISO 9001 and ISO 30401 [25; 2].

Context of organization means determination of interested parties and their requirements and establishment, implementation, maintenance and continual improvement of the system, including needed processes and their interactions;
Leadership means the role and responsibilities of top management to support the process;
Planning means establishing objectives and how they can be reached;
Support meaning needed resources and capabilities, communicational channels, creating and updating information and documenting;
Performance evaluation means identifying points to monitor and evaluate, methods and analyzing the results;
Improvements mean continually improving the system's suitability, adequacy, efficiency and effectiveness.

Identifying the overlapping clauses is extremely helpful for future work with the standards, especially for their partial and/or full integration.

ISO 30401:2018 exclusively emphasizes the role of leadership and culture in KMS. Top managers should develop a culture that values, supports, and enables KM and direct, motivate, inspire, empower, and support persons who contribute to the effectiveness of the KMS. Moreover, top managers should manage a balance between knowledge sharing and knowledge protection.

Using a structural coding [22] visualized the process of KM and identified the main components of KMS according to ISO 30401:2018: Knowledge Development, Knowledge Transformation and Enablers (see Figure 6). Knowledge Development involves the following activities: acquiring new knowledge, applying this knowledge, retaining this knowledge, and operating with outdated knowledge. Knowledge Transformation means that an organization should support knowledge

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flows across levels (individuals, teams, and a whole organization) and includes human interaction; recording, documentation or coding of knowledge; structuring or classified codified knowledge; storage for accessibility and internalization. Suitable human resources, processes, technology and infrastructure, culture and governance enable Knowledge Transformation and Knowledge Development to exist. At the same time, the authors of the current paper believe that it's also necessary to include another component – Knowledge Creation because employees have their own experience and are able to learn and, as a result, are capable of creating new knowledge. Knowledge Creation is especially important for companies whose competitive advantage is based on innovation and technologies.

As with any logic and software development, the use of an agile approach to continually retain and refresh the model is a must. However, AI systems require "extra attention". They must undergo rigorous and continuous monitoring and maintenance to continue performing as trained, meet the desired outcome, and solve the business challenges [23].

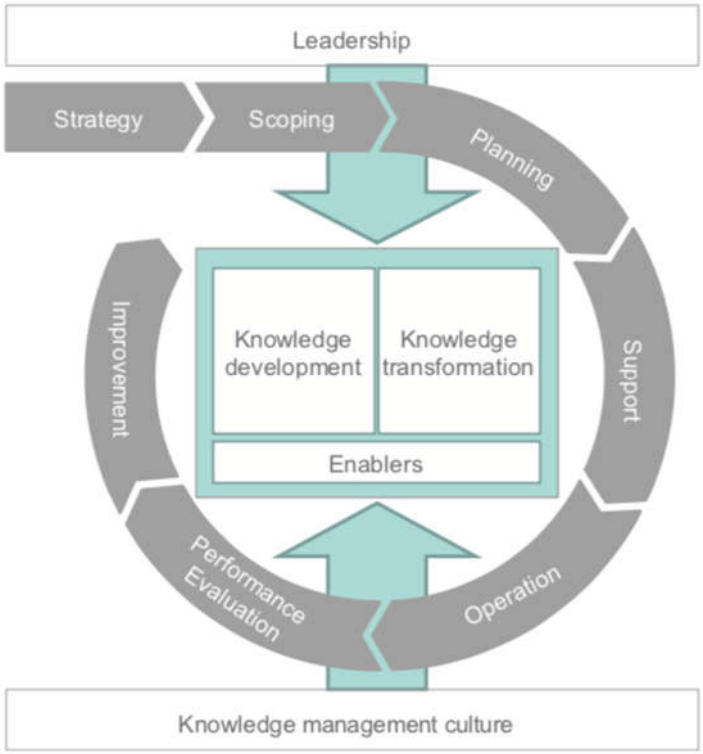

Figure 6. Content of the ISO 30401:2018 KMS standard [22].

Additionally, to the main components, KMS is set up in the organization and is supported by the organization. Thus, the standard suggests two key connectors for KMS and organization – leadership and culture. This suggestion absolutely meets business needs because knowledge management fails due to a lack of support from management and the absence of strong leadership and motivation (both monetary and non-monetary). That's why ISO 30401:2018 emphasizes that knowledge management is a holistic endeavour and that all parts of KMS are interdependent. Therefore, a conscious approach to creating and managing the KMS will allow for achieving organizational goals since the KM is closely connected with the organization's strategic management.

It is very important to be aware of the possibilities of suitable solutions and the limitations of ISO 30401:2018 when correctly determining and effectively solving the main problems of KM implementation, taking into account ISO/IEC 42001:2023 and their common consolidated structure, Figure 7.

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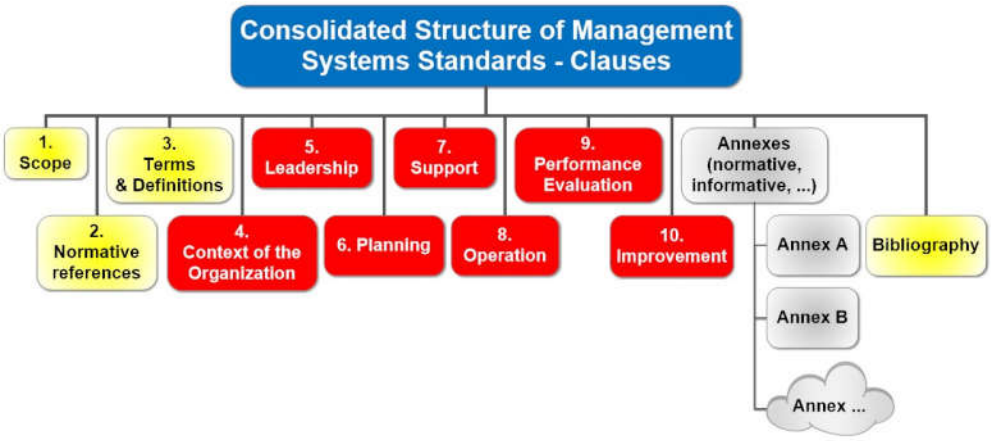

Figure 7. Consolidated structure of management systems standards [26].

Without offering one KM solution that fits all organizations, IS0 30401 suggests that KMS is adaptive and may prevent the most common problems when implementing and running KM. Table 7 summarizes the suggestions of ISO 30401:2018 with the support ISO/IEC 42001:2023. As the authors stated, it is necessary for the initial phase to be concerned with tasks to define the business objectives and translate them to machine learning objectives to collect and verify the data quality [27]. It is also important to set objectives when defining tasks and solving problems in implementing KM. If we include AI in this process, then our efforts can verify the quality of the obtained data much more effectively. These recommendations can be especially valuable for people who are encountering knowledge and AI management systems for the first time.

Table 7. Overview of problem prevention suggestions according to ISO 30401:2018 and ISO/IEC 42001:2023 [2; 3].

The most common problems and tasks when implementing and running KM	The suggestions of ISO 30401:2018 with the support of ISO/IEC 42001:2023
Inconsistency of KM with the general goals	The organization should determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcome(s)/result(s) (4.1 KMS & AIMS)* The organization should establish objectives at relevant functions and levels. The objectives shall: a) be consistent with the policy; b) take into account applicable requirements; c) be measurable; d) be monitored; e) be communicated; f) be updated as appropriated (6.2 KMS & AIMS) The organization shall identify and document objectives to guide the responsible development systems, and take those objectives into account and integrate measures to achieve them in the development life cycle (Annex A, A6.1.2 & A9.3 AIMS) The organization should implement processes for the responsible design and development of systems (Annex B, B.6.1.& B.9.3 AIMS) Potential AI-related organizational objectives and risk sources can be considered by the organization when managing risks (Annex C, C.2 AIMS)

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Lack of detailed planning and timing for KM project and infrastructure	When planning for the system, the organization shall: a) give assurance that the system can achieved its intended outcome(s)/ result(s); b) prevent, or reduce, undesired effects; c) achieve continual improvement (6.1 KMS & AIMS) The organization shall plan actions to address risks and opportunities to integrate and implement the actions into system processes and evaluate the effectiveness of these actions (6.1 KMS & AIMS)
Organizational mismatch	When planning how to achieve its objectives, the organization shall determine: a) what will be done; b) what resources will be required; c) who will be responsible; d) when it will be completed; e) how the results will be evaluated (6.2 KMS & AIMS) The organization shall identify and document objectives to guide the responsible use of systems (Annex A, A.9.3 & Annex B, B.9.3 AIMS) Top management shall demonstrate leadership and commitment by: a) ensuring the policy objectives are established, are compatible, are aligned with strategic direction: b) ensuring the integration of the system requirements into the organization's business and project processes; c) ensuring that resources are available; d) communicating the importance of effective management and of conforming to the system requirements; e) ensuring that the system achieves its intended outcome(s)/results; f) promoting improvement; g) supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility (5.1 KMS & AIMS) Top managers shall ensure that the responsibilities and authorities for relevant roles within the system are assigned and communicated within the organization (5.3 KMS & AIMS) Roles and responsibilities should be defined and allocated according to the needs of the organization. Annex A, A.3.2 & Annex B, B.3.2 AIMS) The organization shall consider the competence level required for various types of workers (7.2 KMS & AIMS, Annex B, B.4.6 AIMS)
Lack of knowledge sharing	The organization shall determine and provide the resources needed for the establishment, implementation, maintenance, measurement, and continual improvement of the system (7.1 KMS & AIMS, Annex A, A.4 & Annex B, B.4 AIMS) The organization shall: a) determine the necessary competence of person(s) doing work under its control that effects its performance; b) ensure that these persons are competent on the basis of appropriate education, training, or experience; c) where applicable, takes actions to acquire the necessary competence, and evaluate the effectiveness of actions; d) retain appropriate information as evidence of competence (7.2 KMS & AIMS, Annex B, B.4.6 AIMS) Documented information shall be controlled to ensure: a) it's availability and suitable for use, where and when it's needed;

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	b) it' s adequately protected. To control the organization shall address: distribution, access, retrieval and use; b) storage and preservation; c) control of changes; d) retention and disposal. Documented information of external origin determined by the organization to be necessary for the planning and operation of the system shall be identified, as appropriate, and controlled (7.5.3 KMS & AIMS)
Inefficient reward system	The organization shall determine: a) what needs to be monitored and measured; b) the methods for monitoring, measurement, analysis and evaluation need to ensure valid results; c) when the monitoring and measuring shall be performed; d) when the results from monitoring and measurement shall be analyzed and evaluated. The organization shall evaluate the performance and the effectiveness of the system (9.1 KMS & AIMS) Top management shall review the organization's system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. The management review shall considerate: a) the status of actions from previous management reviews: b) changes in external and internal issues that are relevant to the system; c) information on the performance, including nonconformities and corrective actions, monitoring and measurement results, audit results; d) opportunity for improvement (9.3 KMS & AIMS) e) changes in needs and expectations of interested parties that are relevant to the AI management system (9.3 AIMS)

**Numbers in brackets are the numbers for identification of the clauses as well as the annexes of ISO 30401:2018 (KMS) and ISO/IEC 42001:2023 (AIMS).*

As shown in Table 7 and Figure 6, implementing KMS and AIMS management systems together helps organizations address common problems (by reducing or eliminating them) and tackle specific tasks (by improving efficiency in affected units or activities). This combination creates a synergistic effect, enabling the use of tools from both standards. AIMS can be seen as an extension of KMS, elevating it to a new level through the use of advanced software and hardware support (e.g., Quantum IT) and the availability of vast amounts of data and information.

4. Discussion

Special attention should be paid to the distinction between the interpretations of the concept of "information" in the fields of information systems management, linguistics, philosophy, and knowledge management systems. [28]

ISO proposes aligning the implementation of KMS with organizations' strategic objectives and backgrounds. In contrast, ISO 30401:2018 indicates several steps that help establish KMS within the organization, providing a guideline for managers and determining possible directions and necessary actions. Also, the Standard indicates that "interactions between people" help KM create "shared understanding."

It's important to indicate that implementing ISO 30401:2018 does not guarantee the success of full KMS implementation and the absence of any difficulties. Boyes identified several risks that may occur while receiving certification: the risk of low uptake, the risk of low-quality certification, the risk that organizations implement the KM standard symbolically rather than meaningfully, and the risk that the standard is not specific enough or too specific [29].

Additionally, some scientists criticize ISO 30401:2018 because, aiming to improve performance, it provides incomplete recommendations on how to achieve them [21; 4]. Different KM initiatives and

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practices exist in a variety of industries, and conditions may vary. Wagner pointed out that the Standards do not provide guidance on what works under which circumstances or concrete advice on what exactly KM practices should be used. At rest, it's difficult for managers and auditors to estimate the worth of established KMS based on formal criteria [30].

Given the mentioned limitations, Pawlowsky et al. conclude that "ISO 30401:2018 is a signal for outsiders as well as agents within the organization that knowledge as an asset is nourished, cultivated, and managed in an effective way, thus providing an element for closing such informational asymmetries and aligning incentives by means of management mechanisms that are consistently used to enhance the organization's value" [22] (p.522).

Knowledge management and decision support are interdependent activities in many organizations. Artificial intelligence is a key, but also criticized, a building block for advancing knowledge management and decision support. Further research is needed to develop the next generation of decision-support environments that leverage AI technologies [31].

Despite implementing various AI technologies in KM, there remains a lack of systemic understanding of their application. Further studies are needed to address this gap and enhance the integration of AI methods in KM systems [32].

In future developments, we should aim not only for the simultaneous implementation of these standards but also consider their partial or full integration into existing organizational systems. For instance, a partial integration could involve combining ISO 9001 and ISO 30401 while maintaining ISO 42001 as an autonomous standard. On the other hand, full integration could be exemplified by the merger of ISO 9001 with IATF 16949 or ISO 9001 with ISO 13485. Such strategic integrations will enhance efficiency and ensure comprehensive compliance within the organizational framework. Moreover, what might be of interest to EFQM model implementers is the incorporation of the combined ISO 30401 and ISO/IEC 42001 standards into the organization's evaluation using this tool. However, this will require further research and validation of the results [33; 34]. Finally, research should also focus on developing smart assistant systems for social benefits and competitive advantage [35].

5. Conclusions

In conclusion, integrating AI management with Knowledge Management (KM) creates a powerful synergy that enhances both systems' effectiveness. Properly managed AI can be highly beneficial, but mismanagement can lead to significant issues, such as the replication of harmful information from unchecked data. KM systems play a crucial role in preventing uncontrolled AI training by regulating AI usage and minimizing both known and unknown risks. Additionally, AI management systems ensure the correct handling of data, providing added security and reliability [36].

AI will significantly impact the future of work and how organizations manage their KM processes. Many KM initiatives fail to incorporate ongoing advances in AI, making it challenging for organizations to integrate AI into their environments. An adaptive, AI-specific approach to KM implementation supports KM strategy and research, offering knowledge managers tools to align KM with business strategy and technological progress in the AI context. No AI solution will succeed without a clear understanding of the business challenge being addressed and the desired outcome. Since data is the foundation of any AI solution, its preparation is often the most challenging and time-consuming phase of the AI lifecycle. Therefore, a precise understanding of the required data and its composition is essential for effective AI utilization [37].

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