

AI Enterprise Search Platform for Optimizing Technical Documentation Management and Organizational Knowledge in the Construction Industry: A Case Study

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Abstract

In the context of the growing volume of technical documentation and the increasing need for rapid access to relevant information, digital transformation has become one of the key factors influencing the competitiveness of companies in the construction industry. Efficient management of technical documents and organizational knowledge represents a major challenge for companies that simultaneously manage multiple projects and rely on diverse information storage systems. This paper presents a case study on the conceptual development and implementation of an AI-powered Enterprise Search platform designed to optimize technical documentation retrieval and knowledge management processes within Vallys Deco SRL. The proposed solution integrates intelligent indexing, semantic search, and knowledge management functionalities into a unified platform that enables fast and efficient access to both technical and administrative information. The research is structured around two complementary directions. The first focuses on the development of two innovative services: the Technical Documentation Search and Management Service and the Knowledge Management Service. The second addresses the definition of three innovative organizational processes supporting application integration into operational workflows, real-time intelligent assistance, and document compliance management. Furthermore, the study examines the use of IoT-enabled tablets for on-site information access and for assessing the operational efficiency gains achieved through digitalization. The research findings demonstrate the potential of the proposed solution to improve information accessibility, enhance the reuse of organizational knowledge, and increase the efficiency of internal processes, thereby contributing to the acceleration of digital transformation in the construction industry.

Keywords: digital transformation; artificial intelligence; knowledge management; technical documentation; construction industry.

1. Introduction

Nowadays, the construction industry has become one of the most complex economic sectors due to the increasing number of projects, the growing volume of technical documentation, and the need for rapid access to relevant information. In this context, digital transformation has emerged as one of the primary drivers of innovation and competitiveness within the sector.

Over the past decade, construction companies have adopted numerous digital solutions to support project management. However, the efficient organization, retrieval, and utilization of the information generated throughout a project's life cycle remain significant challenges.

Within construction companies, technical documentation typically includes design drawings, technical specifications, internal procedures, occupational health and safety documentation, quality reports, electronic correspondence, and various administrative records. These documents are generally distributed across multiple storage environments, including individual computers, internal servers, cloud-based platforms, and electronic archives. Consequently, locating relevant

information quickly often becomes a time-consuming task, directly affecting operational efficiency and decision-making processes.

The rapid development of artificial intelligence technologies has created new opportunities for optimizing organizational information retrieval and knowledge utilization. Unlike conventional search applications, which primarily retrieve documents based on file names or simple keywords, modern Enterprise Search systems employ intelligent indexing, semantic analysis, and artificial intelligence algorithms to efficiently identify relevant information within large volumes of heterogeneous data.

In this context, knowledge management has become a strategic component of digital transformation initiatives. Centralizing the knowledge generated from previous projects and enabling its effective reuse contribute to reducing information retrieval time, improving collaboration among project teams, and supporting more informed technical and managerial decision-making.

This paper presents a case study on the development of an AI-powered Enterprise Search platform designed to support the digital transformation process within Vallys Deco SRL. The proposed solution integrates intelligent search and knowledge management functionalities into a unified platform capable of providing fast and efficient access to both technical and administrative documentation, regardless of the user's location. The research includes the conceptual development of two innovative services dedicated to technical documentation management and organizational knowledge management, as well as the definition of organizational processes that facilitate the integration of the proposed solution into the company's daily operations. Furthermore, the use of IoT-enabled mobile devices allows on-site access to information and enables the evaluation of the impact of digitalization on operational efficiency.

The remainder of this paper is organized as follows. Following the introduction and literature review, the research methodology and the conceptual architecture of the proposed system are presented. Subsequently, the innovative services and organizational processes developed within the company are described, together with an analysis of their potential benefits for technical documentation management and organizational knowledge management. Finally, the paper concludes with the main research findings and outlines directions for future work.

2. Literature Review

Digital transformation has become one of the most significant drivers of development in the construction industry, driven by the need to improve productivity, optimize operational processes, and efficiently manage the increasing volumes of information generated throughout the project life cycle. In recent years, numerous studies have demonstrated that the integration of digital technologies, artificial intelligence, and intelligent information management systems contributes to enhanced organizational performance and reduced operational costs [1–3].

One of the major challenges faced by construction companies is the efficient management of technical documentation and the effective utilization of knowledge accumulated throughout

project execution. The increasing complexity of modern construction projects results in the generation of large volumes of technical documents, engineering drawings, specifications, procedures, reports, and electronic correspondence. These resources are often distributed across multiple information systems, making them difficult to locate and access. In this context, knowledge management is widely recognized as a strategic factor for improving organizational competitiveness and minimizing information loss [4].

The literature indicates that knowledge management extends beyond the mere storage of information. It encompasses the identification, organization, sharing, and reuse of knowledge generated within an organization. The primary challenge for construction companies is not the creation of knowledge itself, but rather the transformation of tacit knowledge into explicit knowledge that can be easily accessed, shared, and reused in future projects [4]. Furthermore, digital technologies and artificial intelligence play a crucial role in the development of advanced knowledge management platforms capable of providing rapid access to relevant information and supporting more effective organizational decision-making.

Alongside the development of knowledge management systems, Enterprise Search applications have undergone significant evolution. While traditional search systems primarily rely on file names or keyword matching, modern Enterprise Search platforms leverage natural language processing (NLP), machine learning (ML) models, and semantic search techniques to retrieve relevant information from large and heterogeneous document repositories [5], [6].

The application of artificial intelligence (AI) in construction project management has become one of the fastest-growing areas of research. Recent studies indicate that AI algorithms are increasingly employed for cost estimation, project scheduling, safety monitoring, risk assessment, and decision-support optimization [1], [7]. At the same time, advances in large language models (LLMs) and semantic search technologies have expanded the application of AI to technical documentation management and the effective reuse of organizational knowledge.

Another important trend identified in recent literature is the integration of Internet of Things (IoT) technologies and mobile devices into information management processes. Providing on-site access to technical documentation through mobile devices connected to intelligent digital platforms reduces the time required to retrieve relevant information and enhances collaboration among the teams involved in project execution [2], [4].

Recent studies also emphasize that the success of digital transformation depends not only on the development of high-performance algorithms but also on their effective integration into organizational workflows. Artificial intelligence-based platforms must ensure interoperability with existing information systems, information security, and compliance with organizational policies governing document access and management [2], [6].

A critical review of the literature reveals an important research gap. Most existing studies focus on the development of AI algorithms, Building Information Modeling (BIM) technologies, or general project management applications. In contrast, relatively few studies have investigated the implementation of integrated AI-powered Enterprise Search platforms specifically designed for

technical documentation management and organizational knowledge management within small and medium-sized enterprises (SMEs) operating in the construction industry [1], [4], [7].

Addressing this gap, the present study proposes a case study on the development and integration of an AI-powered Enterprise Search platform for technical documentation management and organizational knowledge management within a construction company. The main contribution of this research lies in the definition of a conceptual model that integrates intelligent search, semantic indexing, and organizational knowledge reuse into a unified solution designed to support the digital transformation process.

The development of AI-powered Enterprise Search platforms has significantly transformed the way organizations manage internal information. The latest generation of these systems leverages Natural Language Processing (NLP), Large Language Models (LLMs), and semantic search techniques to retrieve relevant information regardless of the structure or location of the underlying documents. Unlike traditional search systems, which rely primarily on keyword matching, these platforms are capable of interpreting user intent and delivering context-aware results, thereby significantly improving the efficiency of information retrieval processes [5], [6].

Another important research direction is the integration of Knowledge Bases and Knowledge Graphs into organizational information infrastructures. These technologies enable the structured representation of relationships among documents, business processes, and organizational entities, thereby facilitating semantic search and the reuse of knowledge accumulated from previous projects. The integration of Knowledge Graphs with advanced Natural Language Processing (NLP) techniques enables the development of intelligent systems capable of providing context-aware responses to user queries and supporting decision-making in enterprise environments [6].

In the same context, the automated construction of organizational knowledge bases through the extraction of relevant information from large volumes of documents using deep learning algorithms and artificial intelligence techniques has become a key capability for small and medium-sized enterprises (SMEs) in the construction industry. Such systems substantially reduce the effort required to organize information while promoting the effective reuse of organizational knowledge in operational processes [7].

The literature also highlights that the success of digital transformation depends not only on the performance of the underlying algorithms but also on the way these technologies are integrated into organizational processes. Intelligent platforms must comply with security policies, user access rights, and data protection requirements while ensuring interoperability with existing information systems [2], [6].

Within the construction industry, artificial intelligence has been applied primarily to design automation, cost estimation, construction progress monitoring, and risk management. However, research focusing on the application of AI to technical documentation management and organizational knowledge management remains relatively limited. Most existing studies investigate AI applications in engineering or project management processes without addressing in detail the development of integrated Enterprise Search platforms tailored to the specific requirements of construction companies [1], [2], [4].

A recent trend is the integration of mobile devices and Internet of Things (IoT) technologies into organizational digital infrastructures. Providing on-site access to technical documentation through mobile devices connected to intelligent search platforms reduces the time required to retrieve relevant information and enhances collaboration among teams involved in project execution. Furthermore, the automated collection of system usage data enables the assessment of the impact of digitalization on operational efficiency and supports managerial decision-making based on objective performance indicators [2], [4].

The literature review reveals a limited number of applied studies addressing the implementation of integrated AI-powered Enterprise Search solutions within small and medium-sized enterprises (SMEs) in the construction sector. Although numerous studies have demonstrated the benefits of artificial intelligence for information and knowledge management, relatively few present case studies on the development of platforms specifically designed for technical documentation management and their integration into an organization's operational workflows. From this perspective, the present research aims to address this gap by proposing a conceptual implementation model for an AI-powered Enterprise Search platform intended to optimize technical documentation management and organizational knowledge management within a construction company.

In recent years, advances in Large Language Models (LLMs) and Natural Language Processing (NLP) technologies have fundamentally transformed the development of Enterprise Search platforms. These technologies enable the semantic interpretation of user queries and the retrieval of relevant information even when the search terms do not exactly match the terminology contained in the underlying documents. Consequently, modern systems no longer perform simple document retrieval but also support the extraction and synthesis of relevant information from large volumes of unstructured data [8], [9], [10].

At the same time, recent research highlights the increasingly important role of Knowledge Graphs in the development of intelligent information management platforms. These structures enable the representation of relationships among documents, people, projects, and organizational processes, thereby facilitating contextual search and the reuse of existing knowledge. The integration of Knowledge Graphs with artificial intelligence algorithms supports the development of platforms capable of delivering context-aware responses and assisting decision-making within complex organizational environments [11], [12].

Another research area that has attracted considerable attention is the interoperability between Enterprise Search platforms and the information systems already deployed within organizations. In practice, technical documentation is distributed across Enterprise Resource Planning (ERP) systems, Customer Relationship Management (CRM) systems, Building Information Modeling (BIM) platforms, local servers, electronic archives, and cloud services. Consequently, the effectiveness of an intelligent search platform depends not only on the performance of its underlying algorithms but also on its ability to integrate and index information originating from heterogeneous data sources while preserving user access rights and complying with information security requirements [2], [5], [11].

Recent literature has also devoted considerable attention to the relationship between artificial intelligence and knowledge management. Many researchers argue that artificial intelligence should not be viewed solely as an automation tool but also as an enabler of organizational knowledge capture, organization, and reuse. AI-based platforms facilitate the transformation of tacit knowledge into explicit knowledge, enabling knowledge transfer across projects and teams while reducing organizational dependence on the individual experience of employees [2], [4], [12].

Within the construction industry, digital transformation is driven by the combined adoption of Building Information Modeling (BIM), the Internet of Things (IoT), cloud computing, Business Intelligence (BI), and artificial intelligence (AI) technologies. Together, these technologies support the development of the Smart Construction paradigm, which is characterized by the continuous use of digital information throughout all stages of a project's life cycle. Recent studies have demonstrated that this approach contributes to shorter project delivery times, more efficient resource utilization, and improved decision-making quality [1], [3], [13].

Another rapidly evolving research area is the use of mobile devices and Internet of Things (IoT) technologies to provide on-site access to project information. Existing studies indicate that real-time access to technical documentation significantly reduces the time required to retrieve relevant information, minimizes errors resulting from the use of outdated documents, and enhances communication between field personnel and design or project management teams [2], [4], [13].

Despite the advantages highlighted in the literature, the implementation of AI-based platforms remains associated with several challenges. These include ensuring the quality and consistency of the data used to train AI algorithms, achieving interoperability with existing information systems, protecting sensitive information, and promoting user acceptance of AI technologies. Furthermore, recent studies emphasize the need to develop mechanisms that increase users' trust in the recommendations automatically generated by intelligent systems [12], [14].

A critical review of the literature reveals that most existing research focuses on the development of artificial intelligence algorithms, Building Information Modeling (BIM) applications, or the automation of engineering processes. By contrast, relatively few studies investigate the implementation of integrated AI-powered Enterprise Search platforms designed specifically for technical documentation management and organizational knowledge reuse within small and medium-sized enterprises (SMEs) in the construction sector. This research gap has been highlighted by both bibliometric analyses and recent systematic literature reviews, which emphasize the need for applied research and the validation of proposed solutions under real-world operating conditions [1], [4], [6], [14].

Based on these findings, the present study proposes a conceptual model for integrating an AI-powered Enterprise Search platform to support technical documentation management and organizational knowledge management within a construction company. The proposed framework combines semantic search, intelligent indexing, mobile access to information, and integration with organizational workflows into a unified solution designed to accelerate digital transformation and improve the efficiency of day-to-day business operations.

3. Materials and methods

3.1. Research Framework

This research was conducted within Vallys Deco SRL with the objective of developing and conceptually validating an AI-powered Enterprise Search platform designed to optimize the retrieval and management of technical and administrative documentation. The study was based on an analysis of the company's operational activities, with the aim of identifying the main challenges associated with information access and evaluating opportunities for the digitalization of organizational processes.

The research methodology was based on the comparison of two operational scenarios: a conventional scenario, characterized by the manual retrieval of documents from distributed information sources, and a digitalized scenario, based on the use of an intelligent Enterprise Search platform. Comparing these two scenarios made it possible to assess the potential impact of digital transformation on information accessibility and the efficiency of internal organizational processes.

3.2. Research Methodology

The research methodology was structured into six sequential stages. To provide a clear overview of the methodological approach, the main stages of the research are presented in Figure 1. Organizing the methodology into successive stages enabled a systematic approach to the development of the AI-powered Enterprise Search platform, beginning with the analysis of existing organizational processes and continuing with the definition of functional requirements, the design of the system architecture, the development of innovative services, and their integration into the organization's operational activities. The final stage focused on evaluating the potential impact of the proposed solution on the efficiency of internal processes and the management of technical documentation.

Figure 1. Research methodology



Source: Authors' own contribution

As illustrated in Figure 1, the proposed methodology follows a logical sequence of development stages, with each stage providing the information required for the successful implementation of the subsequent one. This structured approach facilitates the progressive

integration of the system components while minimizing the risk of inconsistencies between the functional requirements, the platform architecture, and the targeted organizational processes.

Stage 1 – Analysis of Existing Processes: An analysis of the company's existing operational processes was conducted to identify the main categories of documents used in daily activities, information flows, and the tasks in which the time required to retrieve information has a direct impact on operational efficiency.

Stage 2 – Identification of Functional Requirements: The functional and technical requirements of the AI-powered Enterprise Search platform were defined. These requirements were derived from both the analysis of the company's internal processes and the business analysis carried out in collaboration with the project's technology partner.

Stage 3 – Design of the AI-powered Enterprise Search Architecture: The conceptual architecture of the system was designed by defining the main application components, document indexing mechanisms, the structure of the organizational knowledge base, and the functionalities supporting intelligent information retrieval.

Stage 4 – Development of Innovative Services and Organizational Processes: A conceptual model was developed for the two innovative services proposed in this research: the Technical Documentation Search and Management Service (TDSMS) and the Knowledge Management Service (KMS). In addition, three innovative organizational processes were defined to support the integration of the platform into the company's day-to-day operations.

Stage 5 – Integration into Organizational Workflows: The use of IoT-enabled mobile devices for on-site access to technical information was analyzed, with particular emphasis on their integration into operational workflows and their potential to evaluate the time required to retrieve technical documentation.

Stage 6 – Evaluation of the Impact of Digital Transformation: The proposed solution was conceptually validated by comparing the digitalized scenario with the traditional approach to information management, using performance indicators related to document accessibility, information organization, and the efficiency of information retrieval processes.

To summarize the main activities carried out during each methodological stage and the corresponding research outcomes, Table 1 presents an overview of the research process. The table provides a clear representation of the sequence of activities while highlighting the relationship between the objectives of each stage and the expected research outcomes.

Table 1. Research Stages

Stage	Activity	Outcome
Stage 1	Analysis of Existing Processes	Identification of Processes Suitable for Optimization
Stage 2	Identification of Functional Requirements	Functional Specifications

Stage 3	Design of the AI-powered Enterprise Search Architecture	Conceptual Model of the AI-powered Enterprise Search Platform
Stage 4	Development of Innovative Services and Organizational Processes	Technical Documentation Search and Management Service (TDSMS) and Knowledge Management Service (KMS)
Stage 5	Integration into Organizational Workflows	Optimized Digital Workflows
Stage 6	Evaluation of the Impact of Digital Transformation	Assessment of the Platform's Impact on Organizational Performance

Source: Authors' own contribution

The information summarized in Table 1 demonstrates that the adopted methodology follows a progressive system development approach, beginning with the analysis of the existing organizational environment and concluding with the evaluation of the impact of digital transformation on the company's operations. The outcomes of each stage serve as inputs for the subsequent stage, thereby ensuring the consistency and coherence of the development and implementation process of the proposed solution.

3.3. Conceptual System Architecture

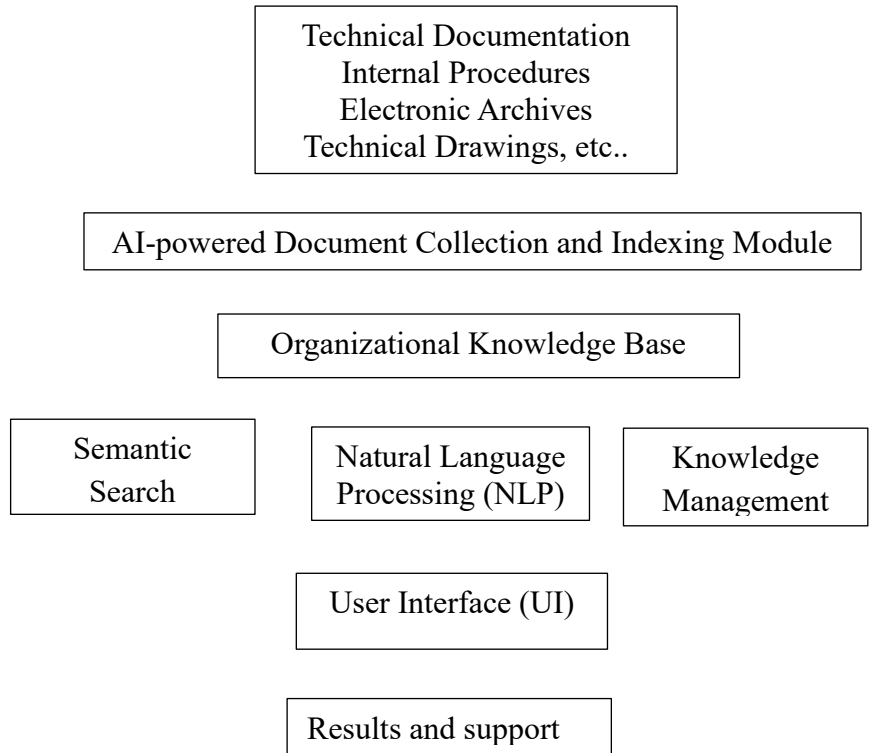
To facilitate the understanding of the proposed solution, the conceptual architecture of the AI-powered Enterprise Search platform is illustrated in Figure 2. The figure presents the main system components and the information flow between data sources, intelligent indexing and search mechanisms, and end users. The platform is designed to integrate technical and administrative documentation into a unified environment, enabling rapid access to information and promoting the effective reuse of organizational knowledge.

The proposed system is designed as an integrated Enterprise Search platform whose primary objective is to centralize the information available across the organization and provide fast, efficient access to both technical and administrative documentation.

The conceptual architecture consists of four main components:

- Document collection and indexing module
- Organizational knowledge base
- AI-powered intelligent search engine
- User interface for accessing information from workstations and mobile devices

Figure 2. Conceptual Architecture of the AI-powered Enterprise Search Platform



Source: Authors' own contribution

As illustrated in Figure 2, the proposed platform is built around a centralized organizational knowledge repository, which is populated through the collection and indexing of the company's existing documentation. The indexed information is processed using semantic search techniques and Natural Language Processing (NLP) algorithms, while the retrieved results are delivered to users through a unified interface accessible from both desktop workstations and mobile devices. This architecture enables the centralization of technical documentation, facilitates the reuse of organizational knowledge, and provides effective support for organizational decision-making.

Through the integration of these components, the platform enables the efficient retrieval of relevant documents, the structured organization of information, and the reuse of knowledge accumulated from previous projects, thereby supporting the development of a comprehensive knowledge management system.

3.4. Evaluation Indicators for the Proposed Solution

The conceptual evaluation of the proposed solution was conducted by defining a set of evaluation indicators designed to assess the potential impact of implementing the AI-powered Enterprise Search platform on organizational processes. The selected indicators were chosen to reflect the primary objectives of the research, namely improving access to technical documentation, optimizing information retrieval processes, centralizing organizational information, and enhancing the utilization of organizational knowledge.

The selection of these indicators was based on an analysis of the company's operational activities and the functional requirements established during the system design phase. These indicators provide the basis for comparing the conventional approach to document management with the digitalized scenario enabled by the AI-powered Enterprise Search platform, while also evaluating the contribution of the proposed solution to improving the efficiency of organizational processes.

The main evaluation indicators used in this research are presented in Table 2.

Table 2. Evaluation Indicators for the Proposed Solution

Indicator	Description	Evaluation Purpose
Technical Documentation Retrieval Time	Time required to locate technical information	Evaluation of information retrieval efficiency
Information Accessibility	Ability to access documents from different locations and devices	Evaluation of information availability and mobility
Document Centralization Level	Degree of integration of documentation into a unified platform	Evaluation of document management effectiveness
Information Retrieval Efficiency	System capability to quickly identify relevant information	Evaluation of platform performance
Organizational Knowledge Reuse	Utilization of accumulated organizational information and experience	Evaluation of knowledge management effectiveness
Integration into Organizational Workflows	Degree to which the system is incorporated into daily operations	Evaluation of the digital transformation process
Decision Support Capability	Platform capability to provide relevant information for decision-making	Evaluation of managerial usefulness

Source: Authors' own contribution

The analysis of these indicators provides an overall assessment of the potential benefits associated with the implementation of the proposed solution and establishes the basis for evaluating its contribution to the company's digital transformation process. Furthermore, these indicators enable the assessment of the platform's capability to support the efficient management of technical documentation and the effective reuse of organizational knowledge in day-to-day operations.

4. Proposed Solution and Its Integration into Organizational Processes

4.1. General Concept of the Proposed Solution

The implementation of an AI-powered Enterprise Search platform is intended to transform the way technical documentation and organizational knowledge are managed within Vallys Deco SRL. The proposed solution is based on the integration of all relevant documents into a unified platform capable of automatically indexing information, performing semantic search, and providing rapid access to the technical documentation required for day-to-day operations.

Unlike traditional document management systems, which rely on manually searching through directories or independent databases, the proposed platform employs intelligent mechanisms for organizing and retrieving information. This approach significantly reduces the time required to locate relevant documents while facilitating the reuse of knowledge and experience accumulated from previous projects.

4.2. Innovative Services Developed

Within the scope of this research, two innovative services were developed to leverage the capabilities of the AI-powered Enterprise Search platform and enhance the management of technical documentation and organizational knowledge. These services are designed to digitalize the processes of information retrieval, organization, and knowledge reuse, enabling rapid access to relevant documentation while supporting decision-making across the organization. Cele doua servicii inovatoare sunt:

a) Technical Documentation Search and Management Service (TDSMS)

The first innovative service developed within the project is the Technical Documentation Search and Management Service (TDSMS). The service employs an advanced AI-powered search engine to optimize the management of technical and administrative documentation. It enables employees to quickly identify and access the documents required for their daily activities, regardless of where the documents are stored.

By leveraging intelligent indexing and semantic search technologies, the service enables the rapid retrieval of relevant information while significantly reducing the effort required to locate and consult technical documentation.

The main benefits of the service include:

- Rapid access to relevant technical and administrative documentation
- Reduced information retrieval time
- Improved accuracy of the information retrieved by the system
- Continuous access to the most up-to-date versions of documents
- Enhanced efficiency of technical and administrative operations

b) Knowledge Management Service (KMS)

The second innovative service developed within this research is the Knowledge Management Service (KMS), which is designed to establish a centralized platform for organizing, managing, and leveraging organizational knowledge. The service utilizes the capabilities of the AI-powered Enterprise Search platform to collect, organize, and index the knowledge and experience accumulated from previous projects, providing users with rapid access to relevant information and established best practices.

By centralizing organizational knowledge within a unified repository, the service facilitates the reuse of accumulated expertise and promotes knowledge transfer across teams. As a result, it supports more effective decision-making and contributes to the continuous development of employees' professional competencies.

The main benefits of the service include

- Centralization of organizational knowledge and accumulated experience
- Efficient reuse of knowledge and information derived from previous projects
- Enhanced organizational innovation capability
- Support for continuous learning and professional development of employees
- Strengthened collaboration across teams and departments

4.3. Innovative Organizational Processes

In addition to the development of the innovative services, the research resulted in the definition and integration of three innovative organizational processes that leverage the capabilities of the AI-powered Enterprise Search platform to optimize technical documentation management and organizational knowledge management. These processes are designed to digitalize information workflows, improve operational efficiency, and enhance collaboration across departments, thereby facilitating the implementation of a modern information management framework.

The innovative organizational processes developed in this research are as follows:

a) Integration of the AI-powered Enterprise Search Platform into Organizational Workflows

The first innovative organizational process focuses on integrating the AI-powered Enterprise Search platform into the organization's day-to-day operational activities. This process enables rapid access to the technical and administrative documentation required to perform routine tasks, thereby reducing information retrieval time and eliminating the challenges associated with multiple and distributed documentation sources.

Integrating the platform into organizational workflows contributes to the standardization of information access procedures and enhances collaboration among project teams by ensuring that decision-making is supported by up-to-date and relevant information.

The main benefits of this process include:

- Integration of technical documentation into a unified platform

- Reduced information retrieval time
- Standardized access to technical documentation
- Enhanced collaboration across departments

b) Real-Time Intelligent Assistance (RTIA)

The second innovative organizational process involves the implementation of a Real-Time Intelligent Assistance (RTIA) mechanism, which leverages artificial intelligence algorithms to provide users with contextualized information and recommendations during the execution of their daily activities.

By analyzing user queries and the information available within the Organizational Knowledge Base, the system delivers relevant responses and facilitates the rapid retrieval of the documentation and procedures required to resolve operational issues.

The main benefits of this process include:

- Rapid access to relevant information
- Support for decision-making
- Reduced response time
- Enhanced operational efficiency

c) Technical Documentation Compliance Management

The third innovative organizational process is dedicated to technical documentation compliance management and is designed to continuously monitor document versions, identify outdated information, and ensure that technical documentation remains compliant with applicable technical standards, regulatory requirements, and legislative provisions.

By automating document verification and integrating notification functionalities, the platform reduces the risk of using outdated information and enhances document control across the organization.

The main benefits of this process include:

- Continuous monitoring of document compliance
- Reduced risk of using outdated document versions
- Improved document traceability
- Enhanced quality of organizational processes

The implementation of the innovative services and organizational processes described above leads to the redefinition of the organization's information workflow. To illustrate how information is collected, processed, and utilized within the AI-powered Enterprise Search platform, the information workflow of the proposed solution is presented in Figure 3.

4.4. Benefits of the Proposed Solution

The implementation of the AI-powered Enterprise Search platform is expected to generate a range of benefits for the organization's operations.

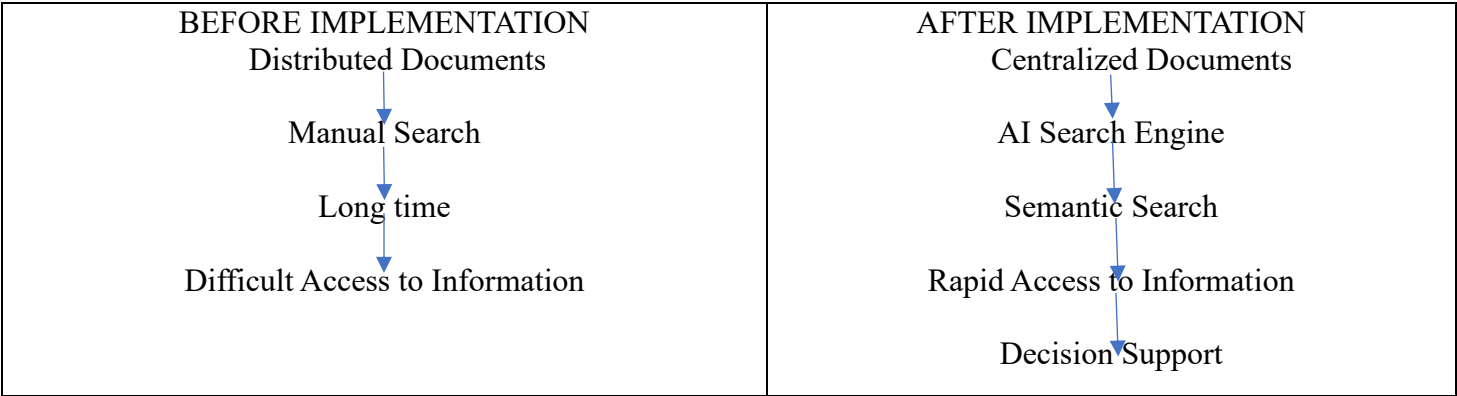
The main expected benefits include:

- Reduced technical documentation retrieval time
- Centralization of documentation and elimination of redundant information
- Improved access to information from any location
- Enhanced reuse of organizational knowledge
- Increased collaboration efficiency across departments
- Improved decision-making
- Support for the company's digital transformation process

Figure 3 illustrates the differences between the information workflow associated with the traditional approach to technical documentation management and the workflow enabled by the proposed AI-powered Enterprise Search platform.

As shown in the figure, under the traditional approach, information is distributed across multiple data sources, requiring users to manually search through several storage locations to locate the required documentation. In contrast, the proposed solution centralizes documentation within a unified Organizational Knowledge Base and employs AI-powered semantic search mechanisms, enabling fast and efficient access to relevant information.

Figure 3. Information Workflow Before and After Implementation



Source: Authors' own contribution

The implementation of this information architecture contributes to reducing the time required to retrieve documents, improving collaboration among users, and enabling the effective utilization of organizational knowledge. Furthermore, the platform establishes the foundation for integrating technical documentation into the company's operational workflows, thereby supporting its digital transformation process.

To highlight the functional differences between the traditional approach to document management and the proposed solution, Table 3 presents a comparative analysis of the main characteristics of the two approaches. The comparison focuses on aspects related to information

organization, information retrieval methods, document accessibility, and the contribution of each approach to organizational knowledge management.

Table 3. Comparative Analysis

Traditional Approach	AI-powered Enterprise Search Solution
Manual Search	Semantic Search
Distributed Documentation	Unified Organizational Knowledge Base
Limited Access to Information	Access via Desktop and Mobile Devices
Long Retrieval Time	Rapid Information Retrieval
Dispersed Organizational Knowledge	Integrated Knowledge Management

Source: Authors' own contribution

The information summarized in Table 3 highlights the advantages of implementing the AI-powered Enterprise Search platform compared with traditional approaches to technical documentation management. The centralization of information, the use of semantic search technologies, and the integration of knowledge management functionalities contribute to the optimization of information workflows and improve access to technical documentation. Furthermore, the proposed solution facilitates the reuse of organizational knowledge and supports decision-making by providing rapid access to relevant information.

5. Conclusions

This paper investigated the integration of an AI-powered Enterprise Search platform within a construction company with the objective of optimizing technical documentation management and organizational knowledge management processes. The research was based on the analysis of existing organizational processes and the development of a conceptual model integrating semantic search, document management, and knowledge reuse functionalities into a unified platform.

The findings indicate that the proposed solution has the potential to centralize technical information, reduce the time required to retrieve technical documentation, and improve access to relevant information during the company's day-to-day operations. Furthermore, the integration of artificial intelligence technologies and knowledge management functionalities establishes the foundation for a digital environment that enhances collaboration across departments and supports organizational decision-making.

A key contribution of this research is the development of a conceptual model tailored to the specific requirements of a construction company, combining the capabilities of an Enterprise Search platform with dedicated services for technical documentation management and organizational knowledge management. In addition, the integration of mobile access to information and the definition of organizational processes supporting digital transformation provide practical guidance for the implementation of the proposed solution.

This study also has several limitations. The research is based on a single case study and the conceptual validation of the proposed solution, without an extensive experimental evaluation of system performance under real operating conditions. Consequently, the findings should be interpreted within the specific context of the analyzed company and the objectives of its digital transformation initiative.

Future research will focus on the development and experimental validation of the platform in real-world operational environments, the integration of advanced generative artificial intelligence models to assist users in document retrieval and analysis, and the extension of the proposed solution through integration with Building Information Modeling (BIM) systems, Enterprise Resource Planning (ERP) platforms, and other applications used in construction project management. Furthermore, evaluating system performance using quantitative indicators—such as response time, retrieval accuracy, and user satisfaction—will represent an important step toward validating the effectiveness of the proposed solution.

By integrating semantic search, knowledge management, and artificial intelligence technologies, the proposed platform demonstrates the potential of AI-powered Enterprise Search solutions to support the digital transformation of construction companies while improving the efficiency of technical documentation management and organizational knowledge management processes.

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