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Digital Transformation through Artificial Intelligence in Organizations: A Systematic Literature Review

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Abstract

The current paper reviews the present literature in the most known scientific databases in the management and business fields about artificial intelligence (AI) and digital transformation within organizations. The main objective is to extract related research axes and uncover gaps in this emergent topic. The methodology used is a systematic literature review with RStudio software based on 36 selected papers from the Scopus and Web of Science (WOS) databases in the period of 2019-2024. The main axes identified are AI potential for organizations' performance, innovation and AI potentials, and AI adoption determinants. Regarding the discussion and analysis of the results, future directions are projected to cover all sides of digital transformation through AI tools. The main contribution of this paper is to provide researchers and practitioners with current advancements and changes in Al tools utilized to facilitate digital transformation within evolving economic and social landscapes for companies.

Keywords: Digital Transformation, Artificial Intelligence, Management, Organizations, Research Perspectives, Systematic Review.

Introduction

Digital transformation (DT) encompasses deep reflection on business models, business processes, and organizational culture. It is prompting companies to rethink their traditional approaches and proactively embrace the opportunities offered by technological advancements, such as artificial intelligence, the Internet of Things, and many others. Digital transformation is a global and strategic process, in which companies integrate digital technologies into their entire operations to improve operations, innovate, and deliver new experiences to their customers.

DT is multidisciplinary because it requires changes in organization, strategy, supply chains, and marketing (Verhoef et al., 2021). It is a process that strives to enhance entities by implementing substantial transformations using a blend of information, computing, communication, and connectivity technologies, as outlined by Vial (2019). This process is stimulated by external environmental changes and digital technology advancements.

At this level, organizations are seen as key players and favorable spaces for technological innovation (Glée, 2016). They are also considered critical players in digital transformation as adopters and manipulators. Contemporary organizations must respond and adjust to these evolving circumstances (Hanelt et al., 2021).

DT in organizations is one of the most pressing preoccupations of recent studies in the business and management fields. DT is defined by Hanelt et al. (2021) “as organizational change that is triggered and shaped by the widespread diffusion of digital technologies”. It is a process of change in organizations through digital technologies.

In that context, numerous technologies are emerging in the digital age, including blockchain, loT, cloud computing, and artificial intelligence. However, among these innovations, artificial intelligence (Al) stands out as the most prominent. Toorajipour et al. (2021) and Akter et al. (2022) define AI as the ability of computers to interact with human capabilities. AI is recognized for its potential in the decision-making process and in reducing the complexity facing organizations and managers (Jarrahi, 2018).

The present paper focuses on digital transformation through artificial intelligence tools. It is critical to explore the role of artificial intelligence in digitizing organizations and discover how AI technologies can automate business processes, enhance decision-making, and transform the way organizations operate. Moreover, the potential challenges and opportunities that come with the incorporation of AI in organizations are also relevant to study. By leveraging AI technologies, organizations can streamline their operations, increase their

efficiency, and achieve a competitive edge in the digital age (Chernov et al., 2020). Additionally, AI can show a key function in strategic management by delivering insights and analysis on the macro- and micro-level of the organization.

Recently, academics have started paying attention to the application of artificial intelligence in organizations and have attempted to identify how they can benefit from it (Haefner et al., 2023). Previous studies called for a focus on AI use in organizations in the field of management research to develop solid theoretical foundations and practical advice (Raisch & Krakowski, 2021). Given the novelty of the topic, theoretical analyses are needed to explore the emergence of this technology in depth. Moreover, a review of the literature is needed to address current and future research trends. It is uncommon to find systematic reviews or meta-analyses originating from the management field, as noted by Hanelt et al. (2021) and Vial (2019).

The present paper is at the core of this topic and aims to identify research axes and gaps that should be addressed in future studies. The following research issues are addressed: What are the applications of AI in organizations? How can organizations benefit from AI innovations? What organizational services benefit from AI tools? How is AI useful for organizations to achieve digital transformation? To summarize all those preoccupations, the main question that the study aims to answer throughout this review is as follows: What are the research trends on the topic of AI and digital transformation in organizations?

To answer these questions, this paper examines the available research within the prominent scientific databases across management and business disciplines, focusing specifically on artificial intelligence (Al) topics and their applications in organizations in the context of digitalization. An adequate methodology for this type of research is a systematic literature review (Snyder, 2019). A systematic literature review is conducted to afford a general and thorough view of AI uses in organizations. Authors selected published papers from 2019 to 2024 in coherence with the increasing number of research about DT recently. The architecture of the paper is organized as follows: The first part will present the basic concepts of the study (digital transformation and AI) as previously advanced in the literature. The second part will detail the research methodology steps concerning the systematic literature review design. The third part will be organized regarding the results of the data analysis. The last section discusses future research directions and contributions of the study.

Digital transformation and artificial intelligence

Digital transformation within organizations

Liu et al. (2011) argued that digital transformation is "an organizational transformation that integrates digital technologies and business processes in a digital economy" (p. 1730). Warner and Wäger (2019) expanded on this, noting that digital transformation encompasses several

operational fields, including information systems, innovation management, strategic and operations management, and marketing (Verhoef et al., 2021).

In that context, researchers and practitioners need to understand how organizations react to digital technologies and apply organizational change. Research has recently begun to explore themes such as digitization, digitalization, and digital transformation. Among these, digital change has garnered the highest focus within business fields. The marketing field focuses on digital broadcasting and social media's effects on organizations and consumers (Hadoussa et al., 2023). The strategic management field concentrates on the renewal of business models. The information system literature has directed on the technical development of digital technologies and their adoption and use (Verhoef et al., 2021).

Several researchers discussed the drivers of DT (Kraus et al., 2022; Verhoef et al., 2021; Vial, 2019; Warner &Waeger, 2019). They advance that the Worldwide Web, big data, and the advent of emerging digital technologies, such as artificial intelligence, blockchain, and the Internet of Things, promote the process of DT. Moreover, there's a significant shift in competition dynamics. Within the retail sector, technological advancements have led to a disruption in the competitive arena, transferring market shares towards relatively nascent digital enterprises. This alteration in consumer conduct stems from their increased connectivity, access to information, empowerment, and engagement in various activities.

Furthermore, some studies have discussed the phases of digital transformation (DT). Verhoef et al. (2021) identify three main phases, beginning with "digitization," defined as "the encoding of analog information into a digital format" (p. 891). Digitization involves converting analog information into a digital format that can be processed by a computer. This process includes transforming data or information in a physical or analog form, such as printed documents, images, or audio recordings, into a digital form that can be stored, manipulated, and transmitted by computers. Digitization enables easier storage, retrieval, and sharing of information. The second phase is "digitalization" which is more advanced than digitization and impacts value creation, delivery, and the customer experience. This has resulted in the emergence of new business models, such as frugal innovation and the circular economy, which leverage digital technologies to create innovative solutions and maximize efficiency. Digitalization has reconfigured business landscapes, necessitating companies to rethink their strategies to adapt and compete in the evolving environment (Verhoef et al., 2023). Digitalization is also related to environmental issues and business sustainability. It was proved by Zheng et al. (2023) that internal and external digitalization is positively linked to corporate social responsibility CSR performance. Furthermore, digitalization is not solely concentrating on cost savings but also encompasses process upgrading that improves customer experiences (Verhoef et al., 2021).

The "digital transformation," known as the third phase, introduces a new business model by applying novel business logic to generate and capture value. This revolutionizes the entire company and its operational methodologies. Leveraging digital technologies, digital transformation facilitates cross-border interactions with suppliers, customers, and competitors, offering the potential for gaining a competitive edge by reshaping the organization to optimize existing core competencies or cultivate new ones. Consequently, digital transformation is intricately intertwined with strategic alterations in the business model, stemming from the integration of digital technologies (Soomro et al., 2024). It represents a company-wide shift with extensive organizational implications, notably impacting the fundamental business model of the firm through the application of digital tools.

Despite the increasing number of studies about digital transformation, this emergent topic calls for many more studies because of its multidisciplinary (Zhu et al., 2021). Most research has focused on traditional business areas (Nakara et al., 2021). However, DT requires a high level of maturity and leads to changes in the business model through the integration of emergent technologies (Theiri & Hadoussa, 2023; Vial, 2019; Zhu et al, 2021; Kraus et al., 2021). This complex process influences organizational structures and hierarchies (Plekhanov et al., 2023). The study of digital transformation is required to encompass a broad range of contexts and related issues.

Artificial intelligence applications in organizations

AI is one of the most prominent levers of Industry 5.0 and the digitalization process. AI is associated with the ability of computers to relate to and replicate human competencies (Ahmed et al., 2023; Akter et al., 2022). AI is defined as "the capability of machines to communicate with, and imitate the capabilities of humans" (Toorajipour et al., 2021, p. 1). Despite its emergence in 1950, AI has only recently begun to gain widespread adoption across all economic sectors. Recent advancements in AI tools are attributed to progress in machine learning, big data, and computational power (Riahi et al., 2021).

The definition of AI varies depending on the perspective considered. A narrow interpretation of AI may include any device or equipment employing computational capabilities to imitate human intelligence (Riahi et al., 2021). Alternatively, AI is characterized by a system's capacity to replicate human intellect, ideally displaying the trait of rational decision-making and executing actions conducive to achieving predefined objectives, as proposed by Cerka et al. (2015).

Overall, the integration of AI in organizations can revolutionize the way they function and significantly improve productivity and efficiency (Holzinger et al., 2023). Organizations need to comprehend the capability of AI and how it can be effectively deployed throughout their enterprises.

AI is transforming the way organizations maneuver and make strategic decisions. With the ability to analyze vast amounts of data, artificial intelligence can provide valuable insights and predictions that can greatly impact business strategies. By leveraging artificial intelligence in organizations, businesses can improve customer service by personalizing experiences and responding quickly to customer requests. Additionally, artificial intelligence can increase business efficiency by automating repetitive tasks and optimizing processes (Riahi et al., 2021; Chernov et al., 2020). It can also lower risks by enhancing the accuracy of forecasting and detecting anomalies promptly. Furthermore, artificial intelligence can have routine administrative functions, allowing human employees to focus on more complex and strategic tasks. In conclusion, artificial intelligence has a multitude of advantages for organizations, including enhanced decision-making, supported customer service, improved efficiency, reduced risks, and strategic analysis capabilities.

The increasing number of studies about artificial intelligence in the management field does not deny the existence of research gaps and challenges in studying this technology. For example, researchers have to understand the effective integration of AI in work and systems and how it impacts organizational culture and structure. Issues related to reliability, security, and perception of AI should be addressed (Svetlana et al., 2022).

Digital transformation and artificial intelligence

DT through artificial intelligence has become a crucial factor for organizations in today's rapidly evolving technological landscape (Ahmed et al., 2023; Ali Mohamad et al., 2023; Borges et al., 2021; Chatterjee et al., 2021). Al's rising adoption across industries has led to its widespread presence in scholarly discussions across various domains (Riahi et al., 2021). Despite the increasing research focus on Al, there remains a necessity to examine deeper into its role in driving digital transformations within organizations. There is barely any conceptual or empirical research that examines the way organizations are digitally transformed (Warner & Waeger, 2019). They focused on identifying and developing dynamic capabilities in organizations for digital transformation.

There is no systematic review completely committed to AI uses in organizations. By connecting the power of AI, organizations can revolutionize their operations, streamline processes, and gain a competitive edge (Warner & Wager, 2019). The digital transformation process utilizes Al technologies like machine learning, natural language processing, and predictive analytics to streamline tasks, drive data-informed decisions, and enrich customer interactions. Embracing digital transformation with Al empowers organizations to discover fresh avenues for growth and prosperity in the digital era. As per the author's awareness, there is a lack of a comprehensive literature review on Al's organizational applications for digital transformation, indicating a research gap in understanding the complete scope and influence of digital technologies (Velarde et al., 2019). Added research is required to explore and

analyze the implications of different aspects of digital transformation and artificial intelligence. The present paper focuses on this gap and tries to clarify the path for future research through a systematic literature review of existing studies in the most known databases (Scopus and Web of Science).

Methodology

A systematic literature review is an investigation methodology that involves a detailed and structured approach to reviewing and synthesizing existing academic literature relevant to a specific topic (Snyder, 2019). By following a predefined set of steps, such as choosing research problems, choosing bases, performing searches, applying showing conditions, and producing the results, researchers can ensure an inclusive and unbiased analysis of the available literature. A systematic literature review allows us to obtain a clear and thorough understanding of the current state of knowledge in digital transformation through artificial intelligence. This understanding can identify areas for further investigation and contribute to the advancement of knowledge in the management of DT. This section is organized in respect of systematic literature review design as recognized by many authors (Snyder, 2019; Riahi et al., 2021; Hanelt et al., 2021). Analyzing published works and extending literature appeared compelling for reviewing the abstract subject of "Al and digital transformation" as suggested by the approach of Jauch et al. (1980) related to the content analysis method.

To realize the study's objective of examining literature on this topic, we conducted a descriptive systematic literature review, following Mayring's (2014) recommendations. As a consequence, our methodology adhered to a three-step method, including material collection, descriptive analysis, and material evaluation sections. This approach is adopted by many studies in systematic reviews, such as those by Riahi et al. (2021) and Hanelt et al. (2021).

Materials collection

The research design adopted in this study follows the process of systematic review and is summarized below (Figure 1). The first step involves defining the research question and research objectives. The second step is selecting databases. In our study, we used Web of Science (WOS) and SCOPUS databases to achieve a high level of coverage of scientific papers. These two databases are well-known and widely utilized by most recent systematic reviews (Borges et al., 2021; Giuggioli & Pellegrini, 2023; Reis & Melão, 2023). The third step involves selecting keywords that appear in the title, keywords, or abstracts. Systematic literature reviews rely heavily on the choice of keywords (Riahi et al., 2021). In this study, we chose “organization,” “artificial intelligence,” “digital transformation,” “machine learning,” and “deep learning.” This choice ensures that the selection of articles is closely related to the concerns of AI and organizations. These three steps constitute the first phase of the research methodology and are referred to as the identification phase (Figure 1). At the end of this

phase, the number of papers obtained was substantial (13,859 in SCOPUS and 6,132 in WOS).

Then, Phase Two of material collection (screening) starts by reducing the number of papers and selecting the most relevant ones for the study. We used extraction criteria as suggested by previous studies (Snyder, 2019; Riahi et al., 2021; Borges et al., 2021). Thus, we eliminated conference papers, books, and book chapters. Next, the selection of management and business fields and the English language resulted in a total of 1,003 papers from SCOPUS and WOS. The second criterion for exclusion was the year of publication and journal specifications. This process resulted in 295 papers published between 2019 and 2024 from the two databases.

The third and final phase of material collection aims to identify studies central to the topic through a meticulous analysis of titles and abstracts. In December 2023, the final total of papers chosen for consideration was 36 papers (Appendix 1).

Tool and process

As advanced by Riahi et al. (2021), the most systematic review designs begin with defining the research questions and choosing an appropriate bibliometric technique to verify them. In the present paper, we ask one research question. Moreover, we used RStudio mapping software for the description of the data, which is considered an ideal option for scientific computing (Aria & Cuccurullo, 2017). The authors treated the SCOPUS and WOS databases separately and exported the tables and results to an Excel sheet to gather the results. At that level, we ensure that the figures and tables in the paper are a personal effort of the authors to combine the output of RStudio. It is important to mention that while bibliometric methods often distinctly uncover a field's structure from traditional literature reviews, they do not substitute reading research articles. Researchers possessing thorough field expertise are better equipped to interpret findings. Data analysis and visualization are typically aided by software and entail numerous sub-steps (Aria & Cuccurullo, 2017).

Approach

Based on previous systematic literature reviews, we considered a set of criteria. The selected papers were analyzed based on their abstract and adequacy concerning the research objectives. Descriptive analyses were conducted by extracting scientific publications, the most relevant sources, and the most cited papers (authors). The conceptual structure of the field was treated with three tools: keyword co-occurrence, thematic maps, and word clouds. Then, the results are presented and discussed.

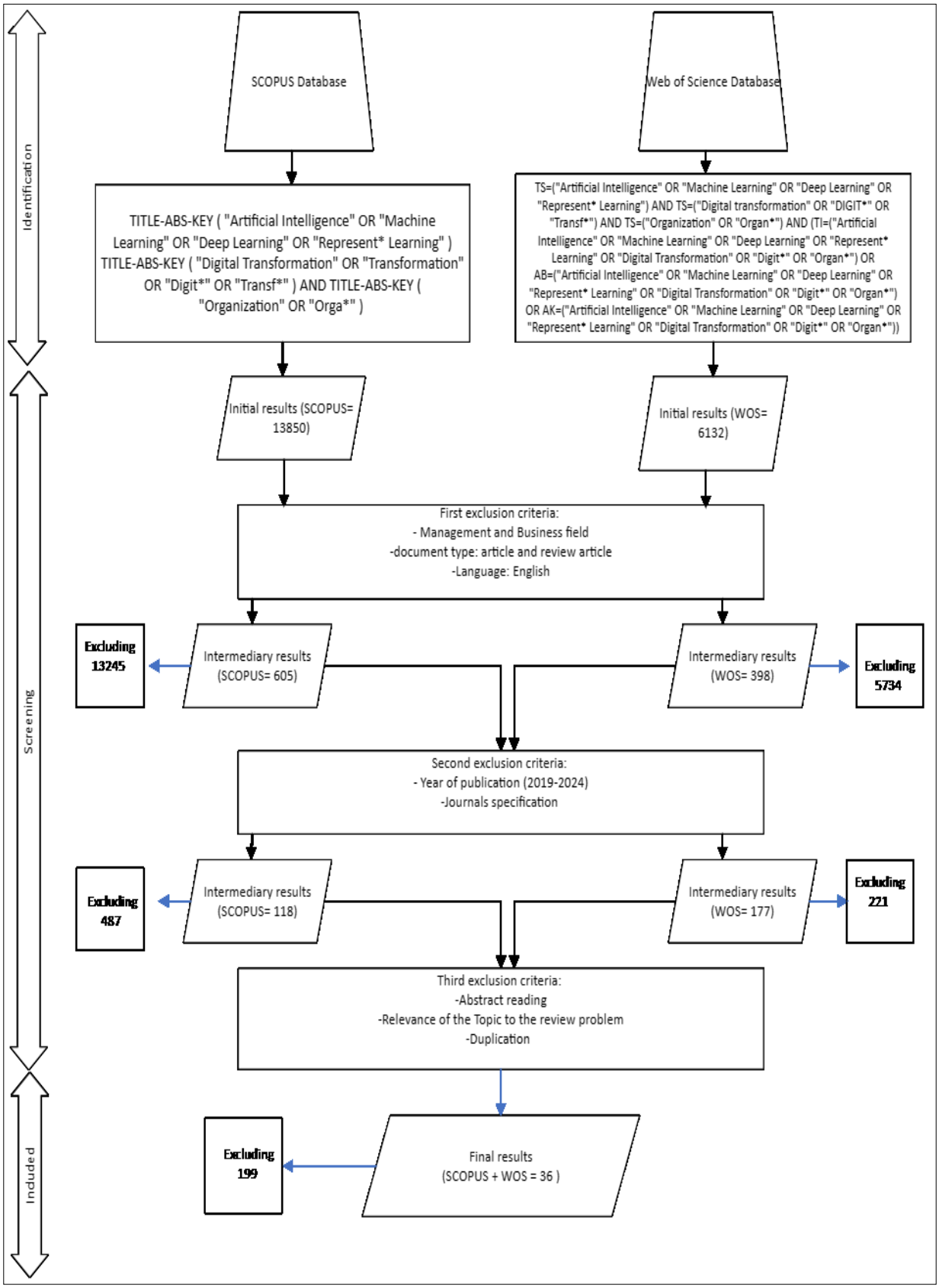

Figure 1. The research design

Results

Results of the systematic literature review

The results of the study were conducted according to the systematic review process. The contribution of the paper is in combining the output of two database analyses. We present the results in two steps. Initially, the descriptive analysis encompasses each year's output of articles, the predominant sources, the authors with the highest productivity, the most pertinent sources, and the top-ranked manuscripts based on citations. Additionally, diverse network mappings regarding words, authorship, and citations were created, alongside the development of a historiographic diagram illustrating the most influential articles within the specified timeframe. Subsequently, the conceptual framework of the field is presented, which includes keyword co-occurrence analysis, a thematic map, and a conceptual map.

Descriptive analysis

Descriptive analysis is presented by three criteria (among others offered by RStudio output) and selected by the authors: the scientific production evolution (Figure 2), the most relevant sources (Figure 3), and the most globally cited papers (Table 1).

The figure below shows the most important authors and cited documents in the Scopus and WOS databases. Warner and Wager (2019) captured more than 670 citations, whereas the three following papers—Bag et al. (2021), Nishant et al. (2020), and Haefner et al. (2021)—captured between 200 and 300 citations each. The most relevant source is the Journal of Business Research and Technological Forecasting and Social Change.

The evolution of publications on the topic of IA application in organizations in the business and management fields respected an ascendant aspect from 2019 to the end of 2023. It is important to mention that the date of the advanced research in the two bases accrued at the end of December 2023. Hence, the fall of the curve at the end is well-explained (one single paper in 2024).

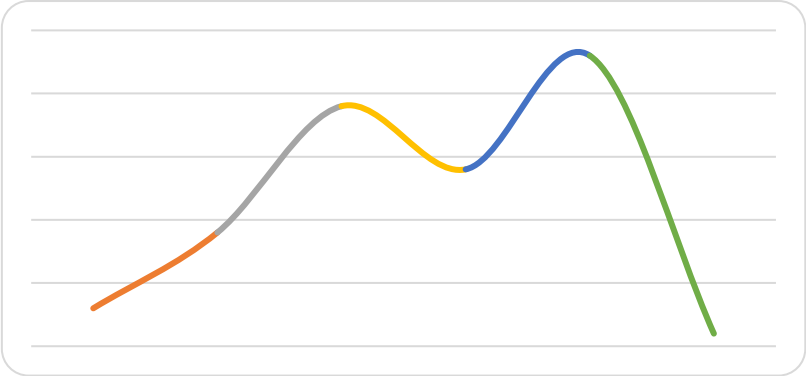

Figure 2. Scientific production evolution in the period 2019-2024 on the topic of intelligence and digital transformation within organizations

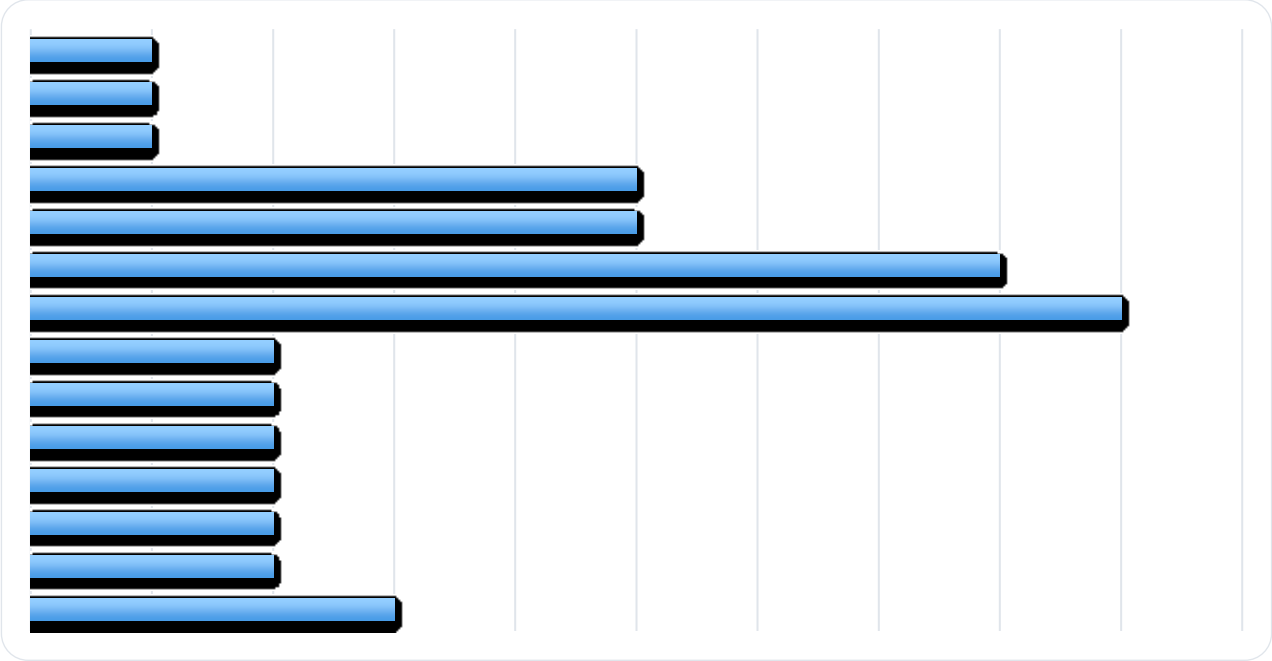

Figure 3. The most relevant sources on the topic of intelligence and digital transformation within organizations

Table 1. Most globally cited papers on the topic of intelligence and digital transformation within organizations

Papers	Citations
WARNER KSR, 2019, LONG RANGE PLANN	673
BAG S, 2021, TECHNOL FORECAST SOC CHANGE	284
NISHANT R, 2020, INT J INF MANAGE	243
HAEFNER N, 2021, TECHNOL FORECAST SOC CHANGE	206
CHATTERJEE S, 2021, TECHNOL FORECAST SOC CHANGE	159
DENICOLAI S, 2021, TECHNOL FORECAST SOC CHANGE	152
LANGLEY DJ, 2021, J BUS RES	146
WAMBA-TAGUIMDJE SL, 2020, BUS PROCESS MANAG J	133
GRONSUND T, 2020, J STRATEGIC INF SYST	90
BURSTRÖM T, 2021, J BUS RES	100
MAHROOF K, 2019, INT J INF MANAGE	90
LEONARDI PM, 2020, ORGAN STUD	84
CAPUTO F, 2019, MANAGE DECIS	80

Conceptual structure of the field

In this section, an advanced analysis of the results is conducted through RStudio software. We chose to present keyword co-occurrence, thematic maps, and word maps. These graphical representations help to identify the most relevant preoccupations of the study in the specific topic of ‘artificial intelligence and digital transformation’.

Keyword co-occurrence

The output below shows the results of the keyword co-occurrence analysis, which revealed clusters of keywords (Figure 4). It reveals that the words AI, performance, innovation, and technology are the most important co-occurrence words in the papers of WOS.

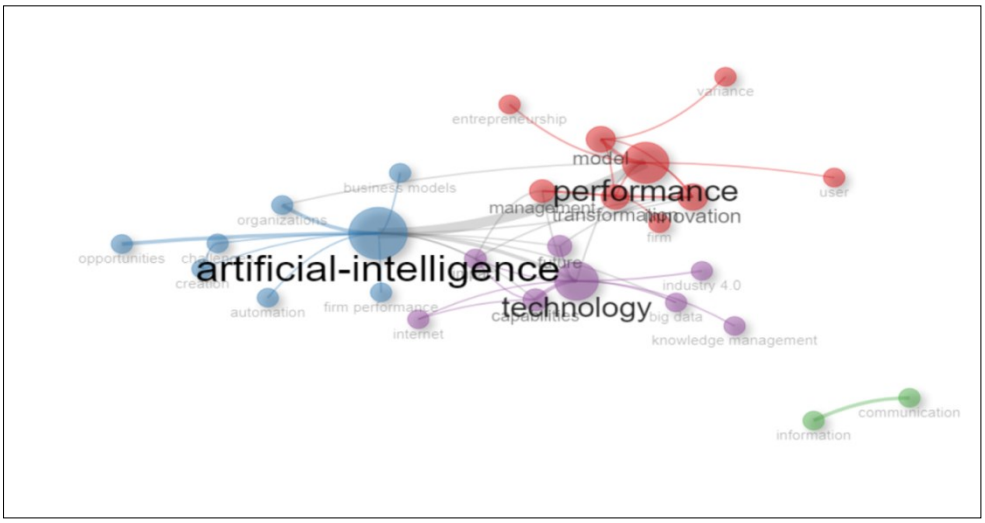

Figure 4. Keyword co-occurrence (WOS) on the topic of intelligence and digital transformation within organizations

Words Map

The main objective of the word map generated by RStudio is to visually represent the frequency of terms or keywords extracted from the literature(Aria & Cuccurullo, 2017). These word maps, often presented as word clouds, help researchers identify prominent themes, concepts, or recurring topics within a body of literature. By analyzing the size and proximity of words on the map, we can gain insights into the most commonly occurring terms, which aids in understanding the focus and scope of the literature. Based on the output below (Figure 5) and perfectly aligned with the former one, the most frequent words are AI, performance, model, innovation, adoption, technology. This is true for the WOS database and is not so far from the results of the two databases gathered (Figure 6).

Figure 5. Words map (WOS) on the topic of intelligence and digital transformation within organizations

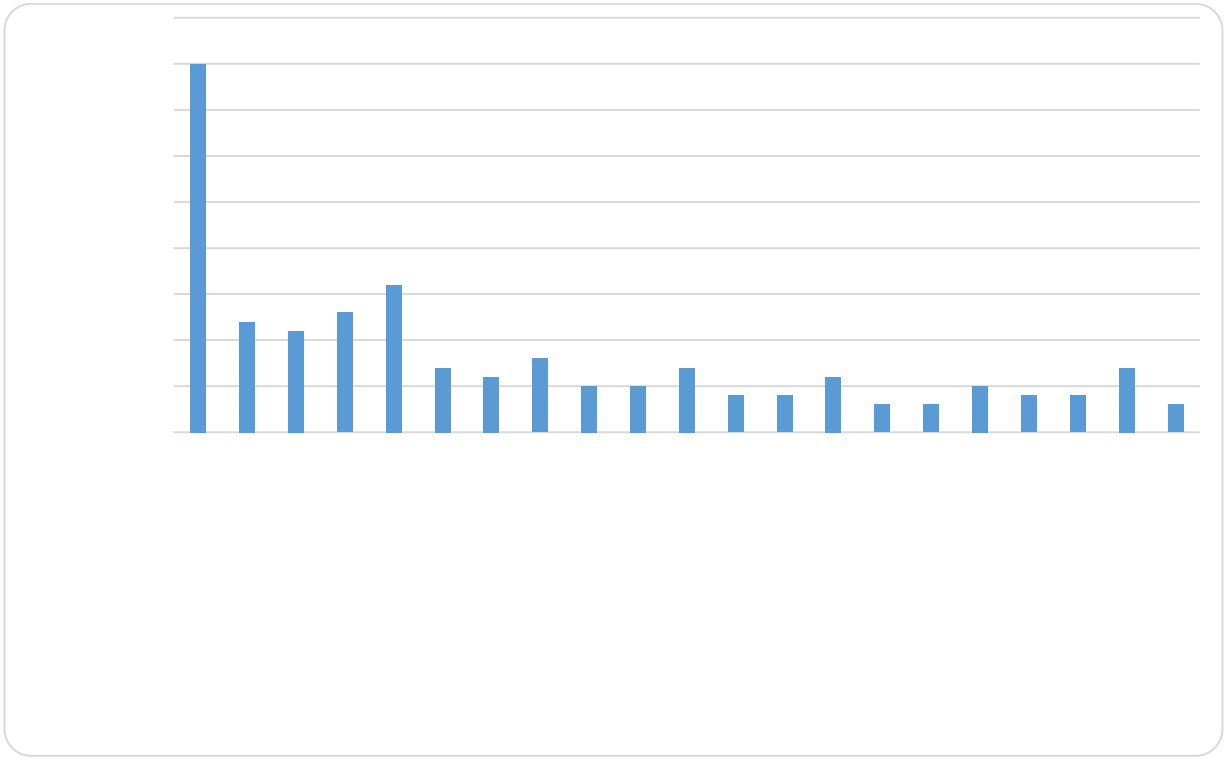

Figure 6. Words relevance (WOS and SCOPUS) on the topic of intelligence and digital transformation within organizations

Thematic Map

The quadrant contains four categories of topics. They are obtained by the interconnection between density and centrality and then classified and mapped in a two-dimensional diagram named a thematic map. The keywords are distributed in four quadrants that reflect the maturity level of the theme.

Results (Figure 5) demonstrate the coexistence of four themes: motor themes, basic themes, motor themes, niche themes, and emerging themes. This figure visualizes the most condensed motor theme.

The motor themes are AI and decision-making, innovation, digital transformation, big data, dynamic capabilities, digital technologies, and enterprise resource management. This category is described by an elevated intensity of density and centrality. Both internal and external links are well-developed.

Basic themes: The basic and transversal themes are characterized by high centrality and low density. These themes are important and refer to the general topic's transversal to the different research areas of the field. It is shown that information technologies, knowledge management, and competitive advantage are the most important themes (Figure 5).

Emerging or disappearing themes: These themes have both low centrality and density, meaning that they are weakly developed and marginal. These themes are personal behavior research, business resource management, digital innovation, business processes, and resource management.

Niche themes: These themes are very specialized; they have well-developed internal links (high density) but unimportant external links and thus are of only limited importance for the field (low centrality). Figure 5 shows that innovation management and the innovation process are the two niche themes in this specific field.

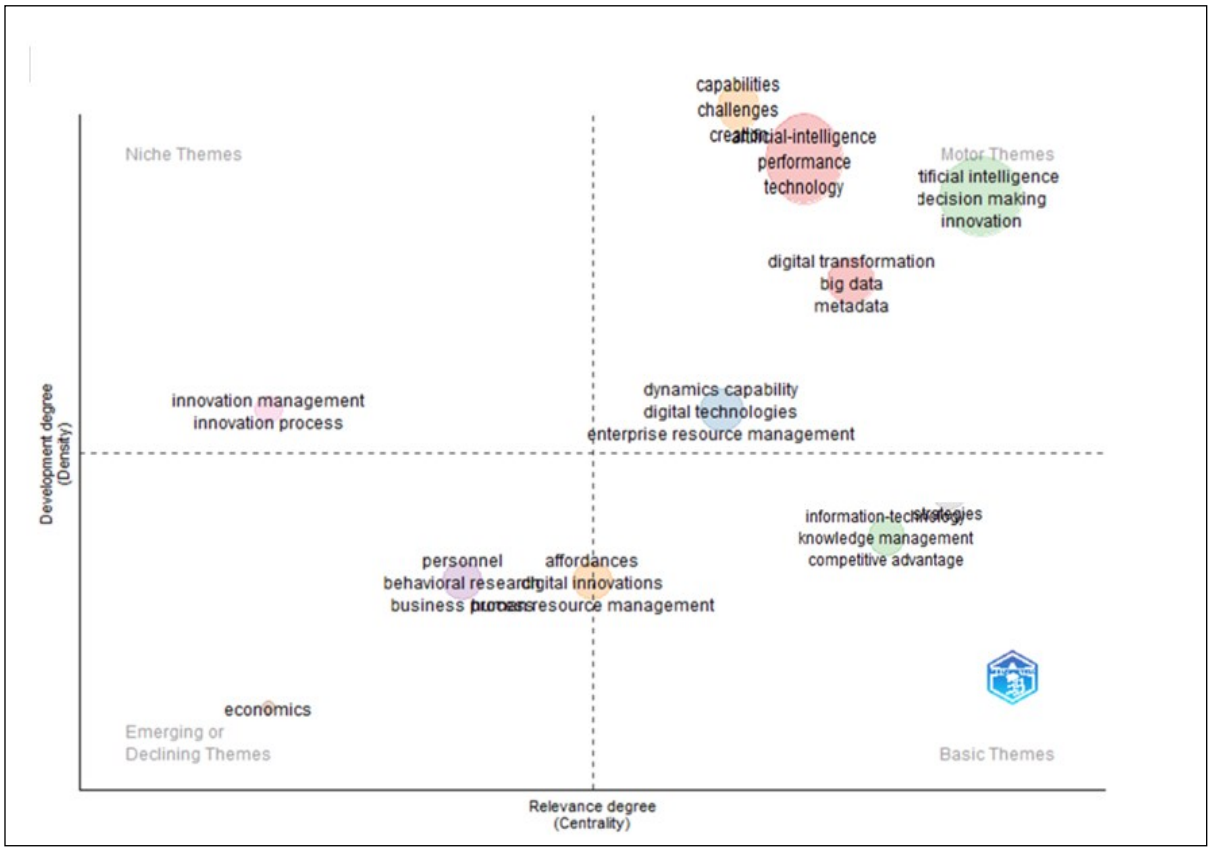

Figure 7. Thematic map on the topic of intelligence and digital transformation within organizations

Results classification and analysis

Analysis of the papers retained from the SCOPUS and WOS databases identified the main thematic advances in the previous studies. Based on the above figures and analyses, authors tried to much all identified topics in three major axes: AI adoption and implementation, AI performance and decision-making, and AI potential and managing innovation. Some emerging topics are also identified. This section is organized regarding those research directions and it discusses their relevance and limitations.

AI adoption and implementation

The most relevant studies found on the topic of AI adoption and implementation, are summarized below (Table 2). The interpretations of these studies demonstrated that the most used theoretical framework for AI adoption is the TOE (Technology-Organisation-Environment) (Tornatzky & Fleisher, 1990). The use of this model is explained by the novelty and the emerging nature of the technology studied (AI). In the major cases, this model is isolated but some studies as that of Chatterjee et al. (2021) have imported the TAM (technology acceptance Model of Davis et al. (1989)). Other theories related to technology acceptance in the Management Information Systems field are neglected. For example, The UTAUT model of Venkatesh et al. (2003) and the previous one could be adopted in future research to explain better human behavior toward the adoption of AI in organizations.

When observing the results of those studies, we point out that technological aspects are not well observed. Most factors are related to organizational capabilities, individual attitudes, and some environmental factors. This finding opens the way for future research directions about the presence of technological determinants of IA adoption.

Table 2. AI adoption studies

Authors	Aim of the study	AI tools	Theoretical framework	Methodology	Adoption factors
Chatterjee et al. (2021)	The adoption of artificial intelligence-embedded technology by digital manufacturing and production organizations.	Industry 4.0 technologies	TOE mixed with TAM	Survey-based data was collected from 340 employees of small, medium, and large organizations.	organizational competency, organizational complexity, and competitive advantage
Mahroof (2019)	Explore the barriers and opportunities of AI within the warehouse of a major retailer.	AI tools for warehouse	TOE	Qualitative study	AI challenges resulting from a shortage of both skill and mindset in operational management
Kinkel et al. (2022)	Prerequisites for the adoption of AI technologies in manufacturing.	AI tools for manufacturing	TOE	Based on a cross-national survey of 655 company representatives from the manufacturing industry	Organizational factors, such as digital skills, company size, and R&D intensity.
Chiu et al. (2021)	Pre-adoptive appraisal toward artificial intelligence in organizations	AI tools	Cognitive appraisal theory	Survey of 363 Taiwanese employees	AI's operational and cognitive capabilities are positively related to affective and cognitive attitudes toward AI

Gkinko & Elbanna, (2023)	The formation of employees' trust in conversational AI in the digital workplace	AI chatbot	The traditional cognitive approach IS research	An interpretive single case study of a global organization	Emotional Cognitive Organizational trust
Bag et al. (2021)	Role of institutional pressures and resources in the adoption of big data analytics powered artificial intelligence, sustainable manufacturing practices, and circular economy capabilities	Big data Analytics powered artificial intelligence	Institutional theory and resource-based view theory	219 automotive and allied manufacturing companies operating in South Africa.	Institutional pressure Coercive pressure Mimetic pressure Tangible resource Workforce skills.

AI performance and decision-making

Numerous research findings acknowledge the advantages of implementing Al within organizational settings. As highlighted by Nishant et al. (2020), Al presents a primary advantage through the automation of routine and time-intensive tasks, thereby enabling individuals to allocate their efforts towards more value-added activities. Furthermore, Al plays a crucial role in uncovering valuable insights from vast volumes of unstructured data, including information from various sources such as videos, images, textual reports, and business documents, which previously necessitated human intervention for analysis and management. Additionally, Al possesses the capability to harness the collective power of numerous computing resources, facilitating the resolution of highly intricate problems.

Moreover, Wamba-Taguimdje et al. (2020) analyzed the impact of Artificial Intelligence (Al) on firm performance, focusing on the business value derived from Al-based transformation projects. Their study examined the multifaceted influence of Al across both organizational (including financial, marketing, and administrative domains) and process performance realms. Instead of viewing Al as a singular technology, they conceptualized it as a diverse set of IT configurations within different industries. Al innovations possess the capacity not only to optimize existing processes but also to enhance automation, information management, and transformative capabilities. Additionally, Al can facilitate functions such as detection, prediction, and human interaction.

Similarly, as highlighted by Olan et al. (2022), advancements in organizational processes and performance in recent years have predominantly been facilitated by innovations like data analytics, artificial intelligence, and business intelligence applications. The growing adoption of these state-of-the-art technologies has enhanced effectiveness, efficiency, and productivity, leveraging both existing and novel organizational knowledge to enhance Al's capabilities. As a result, Al is capable of recognizing redundancies within business operations and optimizing resource allocation to enhance overall performance.

Denicolai et al. (2021) investigated additional performance dimensions, highlighting the beneficial influence of Al readiness on international performance and examining how the interplay between digitalization, internationalization, and sustainability readiness impacts firms. Chen & Lin (2021) explored the ramifications of Al technology advancement on business dynamics, leading to the emergence of business intelligence BI applications. Their findings underscore the direct and substantial cumulative positive effects observed among the components of the Sense-Transform-Drive (STD) conceptual model and BI-related dynamic capabilities. These effects contribute to heightened operational efficiency and overall firm performance.

Chaudhuri et al. (2023) found that integrating digital technologies within a data-centric organizational culture can enhance the sustainability performance of firms. This enhancement occurs through improvements in product and process innovation, as well as financial and operational outcomes.

In a separate study, Caputo et al. (2019) explored the interplay among soft skills, information technologies, and Big Data to establish a connection between human and technological aspects to boost firm performance. Their research highlights strong correlations between certain attributes of human resources, such as work motivation and social competencies, and a company's economic performance. Additionally, the study elucidates how firms' investments in Big Data mediate the relationship between human resources organizational behavior and the economic performance of organizations.

It is clear from previous studies that AI tools have a great impact on firm performance and decision-making processes. However, some researchers underlined critical aspects to consider reaching the expected performance. Wamba-Taguimdje et al. (2020) highlighted that organizations can amplify the business value of their transformed projects and attain improved performance through Al capabilities, but this is contingent upon leveraging these features/technologies to restructure their processes. Additionally, Olan et al. (2022) emphasized that solely deploying Al technologies is inadequate for enhancing organizational performance.

Previous studies' findings call for more investigations into this specific topic to examine more and more the impact of AI tools on firm performance given the complexity related to its measurement and evaluation.

AI and Managing Innovation

AI in organizations has a great impact on business models and how organizations and individuals operate. It was assumed that AI tools alter business models and how individuals and organizations create value (Langley et al., 2021; Sjodin et al., 2021; Shaik et al., 2023).

Burström et al. (2021) added that the necessity for AI business-model innovation must be associated with ecosystem innovation.

The application of Al technologies plays a crucial role in advancing the creation and execution of novel business models that incorporate sustainability principles and tackle environmental issues. Through harnessing Al-driven business model innovation, small and medium-sized enterprises (SMEs) can catalyze sustainable changes, streamline their operations, and harmonize their resource management with sustainable strategies (Shaik et al., 2023).

When integrating Al systems, enterprises encounter challenges encompassing the technology itself, the individuals responsible for its implementation, and the interaction between technology and humans. The true potential of Al lies in fostering a more systematic approach, as highlighted by Haefner et al. (2021), through its integration into innovative organizational practices. Trocin et al. (2021) noted that Al presents hurdles in navigating digital innovation processes and outcomes, raising questions about effectively integrating Al capabilities with various actors, objectives, and tasks. To address these challenges, the authors propose a framework elucidating how Al's capabilities facilitate digital innovation, bridging the gap in defining the boundaries between innovation processes and consequences.

On the other side, Hutchinson, (2021) introduces a concept called self-innovating artificial intelligence defined as the organizational utilization of AI to incrementally advance existing or developing novel products, based on insights from incessantly merging and examining several databases.

Emerging themes and future perspectives

Some emerging and not sufficiently explored areas related to AI are identified in the literature. The first one is related to AI literacy where a paper by Cetindamar et al., (2024) concentrated on the definition and dimensions (AI) literacy through a bibliometric analysis of 270 articles. The study presented four distinct categories of competencies linked to Al literacy: technology-focused, work-centric, human-machine interaction, and learning-oriented capabilities. Zhao et al. (2023) demonstrated that the attributes of organizational digital literacy are pivotal prerequisites for digital transformation. However, advanced digital transformations are propelled by integrating these prerequisites into specific configurations. The research underscores the strategic capability prerequisites essential for achieving successful digital transformations.

The subsequent subject explores how digital technologies reshape organizational structures through enhanced data and knowledge sharing among individuals and entities, ushering in novel challenges for devising efficient governance frameworks. Digital governance plays a pivotal role in fostering digitally driven interactions, suggesting a

categorization of analog, augmented, and automated governance approaches, each entailing distinct mechanisms for control, coordination, incentives, and trust (Hanisch et al., 2023).

Moreover, based on relevant themes figure (Figure 7), among the emerging themes are personal behavior research, business resource management, digital innovation, and business processes. Future perspectives about IA in organizations should consider the topic of IA as an innovation and identify some relevant determinants (behavioral aspects, capabilities, digital innovation intensity, sustainability readiness, IA affordances) and outcomes (business process transformation, resources management, innovation and financial performance, sustainable goals attendance).

Conclusion

Through the current work, we attempt to study an emerging topic in the digitalization era directly related to organizations: the role of artificial intelligence in digital transformation. For this aim, a systematic literature review was carefully performed to identify relevant papers that correlate with AI and digital transformation in organizations. The final selected sample includes 36 papers published in the Scopus and Web of Science databases. We conducted the analyses of the collected data using the RStudio software environment, widely recognized for its usefulness. The analysis and discussion of the results demonstrate the complexity of the task considering the multidisciplinary nature of the digital transformation research problem and the lack of research on the topic. The findings showed the predominance of three major research directions already identified in previous studies: AI adoption and implementation, AI performance and decision-making, and AI potential and innovation management. Some emerging topics related to IA literacy, environmental and sustainability, and AI affordances were also identified.

Results classification and interpretation demonstrated some research gaps that should be addressed in future studies. In fact, around AI adoption, many other theories related to Management information systems literature could be mixed with the TOE framework to extract especially technological factors that were not well studied previously. Furthermore, the positive impact on firm performance was largely maintained but many more studies are called to examine the impact of artificial intelligence on performance (innovation and financial dimensions). To reach this theoretical gap and improve understanding of the effect of AI in organizations, we suggest in-depth analysis through case studies and exploratory research. We also suggest action research in different contexts to deeply understand digital transformation through AI.

In summary, this study offers a preliminary exploration of research patterns concerning artificial intelligence and digital transformation trends. It holds potential interest for scholars

in management information systems and related scientific domains. Additionally, the findings may appeal to managers and professionals seeking insights from this investigation.

Some limitations were encountered in the present study. Combining two databases was a complicated task because of the need to examine many papers. Furthermore, the selected period (2019-2024) is not long enough. Future studies could use a larger interval to obtain a more holistic view of research progress on the topic. The author's future research will be oriented to review the literature on organizational services: IA in HRM, IA in marketing, and IA in strategic management. Moreover, the combination of the IS acceptance models (UTAUT, UTAUT 2, TAM,) is among the most promising topics to cover the adoption and use of AI within organizations and light on the technological factors.

Furthermore, generative AI (Saetra, 2023) was not mentioned in this paper despite its relevance in paying attention to research recently. This limitation is directly related to the choice of keywords and the crucial role of this choice in directing research results. Future studies should take into account this emergent technology.

Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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Appendix 1: List of the selected papers

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