Blending results from existing literature reviews on digital technologies in the *Economia Aziendale* domain

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Abstract

Artificial Intelligence (AI) and digital transformation are currently the most influential forces in business and society. Although numerous studies have examined the impacts of various digital technologies in the field of *Economia Aziendale*, there is a need to consolidate and integrate these findings from different communities of practice. This paper aims to provide a comprehensive overview by conducting an integrative review of existing literature on digital technologies in *Economia Aziendale*, using Scopus and Web of Science databases to identify relevant studies. After careful selection, 25 literature reviews were analyzed. The analysis revealed limited connections among existing reviews, typically across different research communities, except within the AIS community. Some reviews cover multiple technologies using broad terminology, while others delve into specific technologies. Findings are organized within a comprehensive framework that delineates the antecedents and effects of digital technologies. Furthermore, the analysis identifies seven promising areas for future research exploration. This review aims to bridge gaps in the field by synthesizing knowledge across different communities, aiding scholars in contributing to broader discussions on digital technologies' impact. For practitioners, the findings provide valuable insights for navigating the complexities of digital transformation, while policy-makers can use this review to prioritize interventions and allocate resources effectively.

Keywords: Digital technologies, Artificial Intelligence, AI, Literature Review, *Economia Aziendale*

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1. Introduction

Artificial Intelligence (AI) and digital transformation are crucial factors shaping today's business environment (Mancini, 2018). With technological advancements, organizations are increasingly turning to digital technologies to optimize their operations, gain valuable insights from data, and provide support for decision-making and control (Petrosino *et al.*, 2018; Lombardi *et al.*, 2021) and competitive advantage (Petrosino *et al.*, 2018; Presti, 2022). This collaboration between digital technologies and business processes has led to a shift in mindset, enabling businesses to redefine their operational strategies, professional skills, and accounting, tax, management control, and auditing processes, marking the dawn of a new era in digital transformation (Valentinetti and Rea, 2023).

The community dedicated to studying Accounting Information Systems (AIS) has long been exploring the potential role of digital technologies in accounting, tax, management control, and auditing practices (Gray *et al.*, 2014; Sutton *et al.*, 2016). However, there has been a significant increase in studies and literature reviews in this field in recent years. Some of these reviews focus on specific communities of practice, such as financial accounting (FAC) (*e.g.*, Kureljusic and Karger, 2024; Parycek *et al.*, 2024), management accounting and control (MAC) (*e.g.*, Losbichler and Lehner, 2021; Nielsen, 2022), auditing (AUD) (*e.g.*, Eulerich and Kalinichenko, 2018; Lombardi *et al.*, 2023; Abu Huson *et al.*, 2024), tax (TAX) (Belahouaoui and Attak, 2024), accounting education (EDU) (*e.g.*, De Villiers, 2021; Tavares *et al.*, 2023). Other reviews (hereinafter named "Blended") consider different communities together, such as FAC, MAC, and AUD, or accounting and AUD (*e.g.*, Moll and Yigitbasioglu, 2019; Mancini *et al.*, 2021). Three literature reviews published in the Management Control journal could also be considered in the Blended community. Specifically, Petrosino *et al.* (2018) conducted a literature review to explore the relevance of business intelligence and business analytics in the context of big data supporting the decision-making processes. Lombardi *et al.* (2021) proposed a systematic literature review on the application of big data, analytics, business intelligence, and AI in company management and strategic control. Valentinetti and Rea's (2023) systematic literature review focuses on the role of AI in corporate accounting systems, particularly on potential implications and consequences related to financial accounting systems and management accounting.

While valuable previous efforts have been made to explore multiple impacts of different digital technologies on various areas of the *Economia*

Aziendale field, there is a growing need to consolidate and integrate prior literature reviews from various communities within the field. Additionally, the terminology used to describe digital technologies varies, and their connection with AI remains unclear. An integrative review aims to provide a comprehensive overview by compiling existing knowledge from different communities of practice and juxtaposing these perspectives to identify new research areas (Cronin and George, 2023). Therefore, this paper conducts an integrative review of existing literature reviews on digital technologies in the *Economia Aziendale* domain.

We retrieved previous literature reviews by screening Scopus and Web of Science databases. We used a broad set of keywords to cover various digital technologies and communities of practice within *Economia Aziendale*. Our keyword searches were focused on titles, abstracts, and keywords of the studies. We filtered the results to include only studies in English related to Business and from journals listed in the CABS (2021) list, resulting in a sample of 7,656 studies. We then eliminated duplicates and studies that did not provide relevant literature reviews, leaving us with 25.

We use MS Excel to manually code the data, encompassing aims, typologies of digital technologies, communities of practice, types of literature reviews, methodological details, results, and areas for future research. Our analysis revealed limited connections among existing literature reviews, with these links often residing outside the same community of practice, except for the AIS community. Some literature reviews encompass multiple technologies using different and overarching terms (*e.g.*, Moll and Yigitbasioglu, 2019; Mancini *et al.*, 2021; Mugwira, 2022), while others concentrate on a singular type of technology (*e.g.*, Brown *et al.*, 1995; Gray *et al.*, 2014; Han *et al.*, 2023). Our analysis indicates that digital technologies are predominantly studied for their effects on business processes and on both current and future professionals or users. Notably, only one review addresses the antecedents of these technologies. To offer a cohesive overview of findings from various communities of practice, we have created a comprehensive framework. This framework also outlines an agenda featuring seven key directions for future research to investigate across multiple communities of practice.

Through this analysis, we contribute to the literature by synthesizing knowledge from different communities about the digital technologies debate in *Economia Aziendale* and building bridges across communities in the field. This will allow scholars in *Economia Aziendale* to benefit from previous insights and contribute to broader discussions about the impact of digital technologies on society (Sundström, 2024). In addition, for practitioners

(*e.g.*, managers, entrepreneurs, accountants, financial or management accountants, and auditors), this comprehensive overview provides guidance on navigating technologies, their potential, and the challenges they face in their own businesses and professions. As our findings show, policy-makers are pivotal enablers and regulators of these technologies. This integrative review could aid them in setting priorities for interventions, considering urgencies, available resources, and other pertinent political aspects.

The article is structured as follows: The upcoming section defines the conceptual scope, while the third section outlines the methodological details concerning data identification, extraction, and analysis. The fourth section provides an overview of the 25 literature reviews included in the study, and the fifth section delves into the contents of these reviews. The sixth section highlights the main promising topics that future research should explore. The seventh section discusses the implications of our study, and the final section addresses the limitations of our study and offers recommendations for future reviews.

2. Conceptual scope

The integrative review begins with a conceptual overview that delineates the scope of the research, thereby establishing the study's theoretical boundaries. This section involves a comprehensive analysis of key terms, definitions, and theoretical concepts that will be utilized throughout the review, with the goal of clarifying its scope and positioning within the *Economia Aziendale* domain.

As mentioned in the introduction, there is a growing interest in reviewing studies at the intersection of technology and the field of *Economia Aziendale*. However, most literature reviews do not focus on this intersection, with notable exceptions being Gray *et al.* (2014) and Sutton *et al.* (2016). These studies seek to investigate how their community of practice (*i.e.*, AIS) has historically engaged with this intersection and how it can contribute to broader discussions. Recent literature reviews exhibit considerable diversity in focus. Some are dedicated to a single community of practice (*e.g.*, Nielsen, 2022; Lombardi *et al.*, 2023; Kureljusic and Karger, 2024), while others collect studies that draw from multiple communities (*e.g.*, Moll and Yigitbasioglu, 2019; Mancini *et al.*, 2021). Furthermore, certain reviews encompass a range of technologies using broad, overarching terms (*e.g.*, Mancini *et al.*, 2021), whereas others concentrate exclusively on a specific type of technology (*e.g.*, Han *et al.*, 2023).

Before entering into more methodological aspects, we would like to specify our terms of investigation: "Digital technologies" and "*Economia Aziendale*". In this context, "Digital technologies" refers to the combination of information, computing, communication, and connectivity technologies (Martínez-Caro *et al.*, 2020). This includes technologies such as AI, big data, machine learning (ML), natural language processing (NLP), blockchain, and the Internet of Things. Conversely, "*Economia Aziendale*" encompasses a broader field than just Accounting (*e.g.*, Coronella *et al.*, 2018). It studies the *Azienda* as an "integrated complex organism" (Alexander and Servalli, 2011, p. 292). This domain includes various disciplines and communities of practice that explore the *Azienda* as the "elementary economic unit of production and consumption" (Alexander and Servalli, 2011, p. 293) from diverse perspectives. Our integrative reviews occupy the intersection of these two concepts, investigating how a bundle of technologies participates in the process of incorporating technological advancements into the processes, models, and competencies of current and potential professionals and users within the Azienda. As an integrative review, it synthesizes and combines existing literature from different communities of practice within the *Economia Aziendale* domain, emphasizing both common and specific technologies and topics.

3. Method

This integrative review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (Moher *et al.*, 2009). We aimed to investigate how previous literature reviews analyzed digital technologies in the *Economia Aziendale* field of study. A comprehensive research strategy was developed in order to capture the maximum number of relevant articles in each database. Starting from the theoretical boundaries presented in Section 2, the authors engaged in an iterative discussion to identify all eligible technologies and applications, drawing on insights from relevant literature (Gray *et al.*, 2014; Fisher *et al.*, 2016; Sutton *et al.*, 2016; Moll and Yigitbasioglu, 2019; Mancini *et al.*, 2021; Mugwira, 2022; Nielsen, 2022; Dwivedi *et al.*, 2023; Kureljusic and Karger, 2024). Additionally, the authors explored the boundaries of *Economia Aziendale* (Bruno *et al.*, 2024) and pinpointed the main areas through the use of keywords.

Two primary databases relevant to accounting were searched: Scopus and Web of Science. All searches were conducted on March 1, 2024, using the

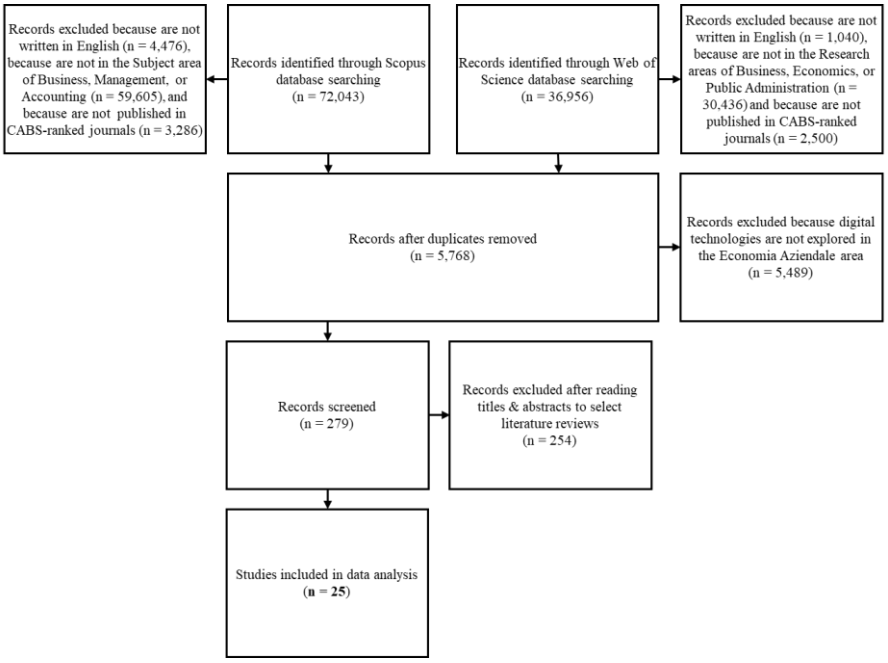
following keywords in the title, abstract, or document keywords: ("AI" OR "artificial intelligence" OR "machine learning" OR "ML" OR "deep learning" OR "supervised learning" OR "unsupervised learning" OR "reinforcement learning" OR "learning algorithm*" OR "learning system*" OR "natural language process*" OR "NLP" OR "neural network*" OR "text analysis" OR "text mining" OR "text-mining" OR "artificial neural networks" OR "ANN*" OR "support vector machine*" OR "SVM" OR "expert system*" OR "latent semantic analysis" OR "LSA" OR "content analysis" OR "computer* content analysis" OR "digital twin" OR "intelligent system" OR "knowledge based system" OR "intelligent decision aid" OR "intelligent decision support system" OR "intelligent agent" OR "audit support system") AND ("accounting" OR "accountant*" OR "audit" OR "auditor*" OR "auditing" OR "continuous audit*" OR "continuous monitoring" OR "continuous assurance" OR "tax" OR "management control" OR "management account*" OR "financial account*" OR "strateg*" OR "entrepreneur*").

Figure 1 shows that 108,999 records were obtained after executing the search strategies. The identified records underwent three rounds of screening. The first performed distinctively in the results of the two databases, including only those records written in English (103,483), published in the subject areas of business, management, accounting, economics, or public administration (13,442), and only in CABS-ranked journals (7,656). After the first round, we merged the two databases, removing duplicates; 5,768 records remained. In the second round, records outside the context of the *Economia Aziendale* area were excluded from reading the titles and abstracts (5,489). The authors acknowledged that certain keywords did not exclusively pertain to digital technologies (*e.g.*, "content analysis," "knowledge-based system") or to *Economia Aziendale* (e.g., "strateg*," "entrepreneur*"). Nevertheless, to mitigate the risk of unintentionally excluding pertinent records during the initial phase, they chose to include these keywords and reserve the selection process for a thorough examination of the titles and abstracts.

The third round involved the inclusion only of literature review records. The titles and abstracts were made visible in the browser, and the word search "review" was run. Before excluding those papers without the word "review" in the title or abstract, we read all the abstracts to make sure that we did not exclude eligible records. 254 articles were excluded in the third round. We did not consider two literature reviews (Muehlmann *et al.*, 2015; Chiu *et al.*, 2019) that address the evolution of digital technologies per se, as the authors describe the evolution of specific journals' publications within the AIS

community. Although focused on auditor judgment bias research, we find the literature review by Lombardi et al. (2023) particularly informative in relation to our aim. The authors also provide a comprehensive analysis of how emerging technology affects auditors' judgments. In total, 25 articles were included in the study.

Figure 1 – PRISMA flow diagram



Data extraction and analysis were conducted by the first two authors collaboratively to enhance trustworthiness. Throughout the extraction and analysis process, when uncertain about certain aspects, they discussed them with the third author until a consensus was reached. We complemented general study characteristics automatically extracted by Scopus and Web of Science (*i.e.*, authors, publication year, title, abstract, publication journal) with data for contents interpretations manually coded (*i.e.*, the levels of CABS-ranked journals, the type of literature review, the community of practice to which the study refer, the type and definition of digital technologies analyzed, the objective of the literature review, details on methods, database, and keywords, the results of the literature review and the research agenda they propose). Data was stored in Microsoft Excel.

4. Descriptive statistics

This section offers a comprehensive overview of the 25 literature reviews included in the study, which can be accessed through the following link: www.sidrea.it/digital-technologies-economia-aziendale.

5. Results

This section offers a comprehensive analysis of several aspects pertaining to the sample of literature reviews. It delves into the digital technologies under study, the typologies of literature review employed, and the methodological specifics. Finally, it presents a framework of the results. The aim is to provide a structured understanding of the digital technology landscape and the research process undertaken by various authors to explore it.

5.1 Digital technology typologies

This section discusses the various digital technologies examined in the existing literature reviews, which can be accessed via the following link: www.sidrea.it/digital-technologies-economia-aziendale.

5.2 Typologies of literature review and methodological details

From a methodological perspective, the identified communities of practice do not display any particular differences in terms of databases, keywords, or data analysis. Differences are more closely related to the specific aim of each literature review, and the range of keywords varies mainly according to the breadth of technologies being investigated. However, interesting considerations could be made regarding the types of literature reviews conducted by the authors. Details are available at the following link: www.sidrea.it/digital-technologies-economia-aziendale.

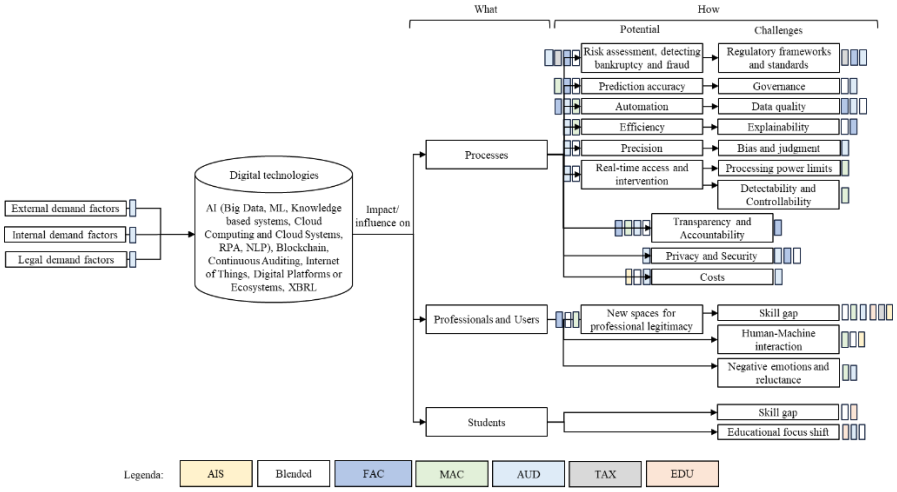
5.3 Framework of results

Upon reviewing the literature, it is evident that scholars in the field of *Economia Aziendale* have predominantly concentrated on investigating the effects of various digital technologies on business processes. However, empirical studies in this domain remain limited (Fisher *et al.*, 2016; Moll and Yigitbasioglu, 2019; Losbichler *et al.*, 2021; Mugwira, 2022; Nielsen, 2022;

Ranta *et al.*, 2023). Consequently, authors within different communities of practice often engage in speculation regarding the potential impacts these technologies may have on financial and management accounting as well as auditing processes, which are often viewed as controversial.

While some attention is given to the implications of technology on professionals (*e.g.*, accountants and auditors), there is also a focus on those who are training for these roles, including accounting students. We have categorized the impacts of digital technologies on processes, professionals/users, and students into two main areas: potential and challenges. Notably, one review addresses the antecedents of digital technologies, making a distinction among external, internal, and legal demand factors (Eulerich and Kalinichenko, 2018). Figure 10 provides an integrated framework that illustrates the effects and antecedents discussed across various communities of practice.

Figure 10 – Framework of results



5.3.1 Antecedents of digital technologies implementation and use

In the AUD community, Eulerich and Kalinichenko (2018) identify notable changes in the business environment that have prompted the adoption of continuous auditing technology. These transformations have heightened the demand for continuous auditing, driven by various external, internal, and legal factors.

The emergence of the real-time economy, propelled by widespread digitalization and the automation of transactions, has become a significant catalyst for the increasing need for continuous auditing. This digital advancement has accelerated companies' operational processes and shortened their financial reporting timelines. Consequently, the growing frequency of reporting necessitates more immediate audit procedures to ensure that financial information remains dependable. Continuous auditing addresses this need by providing real-time monitoring of financial reports, a vital capability in light of the rapid developments in how information is generated, stored, and shared.

Starting in the 1980s, scholars began to emphasize the growing need to integrate advanced technologies into the auditing profession, aiming to enhance both the effectiveness and efficiency of audit tasks. In the wake of high-profile financial scandals such as Enron and WorldCom, the potential of continuous auditing to facilitate the prompt detection of irregularities in business processes garnered substantial attention. Continuous auditing not only supports the accuracy and integrity of financial reporting but also heightens the likelihood of uncovering fraudulent activities, rendering it an indispensable tool for auditors.

The complexity of contemporary information systems, coupled with stringent regulatory compliance requirements, has made it clear that traditional auditing methods are insufficient. In this context, continuous auditing emerges as a transformative solution, enabling auditing techniques to adapt to evolving legal standards and regulations. For instance, the adoption of an XBRL-based continuous auditing framework enables organizations to efficiently, sustainably, and cost-effectively meet regulations such as the Sarbanes-Oxley Act.

5.3.2 Effects on processes

Literature reviews predominantly explore the impact of digital technologies on financial and management accounting, and auditing processes. Among the positive influences discussed, various communities of practice (*i.e.*, Blended, FAC, AUD, and TAX) highlight the transformative role these technologies play in enhancing fraud detection and prevention. Fisher *et al.* (2016) emphasize the crucial role of NLP in enhancing fraud detection efforts. Senave *et al.* (2023) indicate that ML and text mining significantly refine risk assessments and uncover fraudulent activities by analyzing company risk profiles and dependencies. Mugwira (2022) illustrates how internet technologies support decision-making systems that

help auditors identify potential fraudulent behavior. Finally, Belahouaoui and Attak (2024) investigate the promise of AI and blockchain in modernizing tax systems, mitigating financial misconduct, and promoting tax compliance.

Moreover, there is a growing recognition within the Blended, FAC, and MAC communities of the role of AI and big data in enhancing prediction accuracy. Agustí and Orta-Pérez (2023) highlight that these technologies improve financial ratio analysis and bankruptcy forecasting. ML and its subfields are crucial for developing predictive models that assess financial health and detect fraud or errors. These models reinforce the reliability of financial data, making AI indispensable in financial forecasting and risk management (Kureljusic and Karger, 2024). Senave *et al.* (2023) emphasize that text mining provides valuable insights by analyzing elements such as risk and text sentiment measures, readability indices, and non-financial indicators, aiding organizations in predicting future performance. Concurrently, AI and ML are advancing textual analysis in accounting data and reports, and developing innovative predictive methods (Ranta *et al.*, 2023).

Digital technologies offer significant opportunities for automating FAC, MAC, and AUD processes. The integration of AI and ML is reshaping automation, particularly in administrative and auditing tasks. Parycek *et al.* (2024) highlight the critical roles of ML and text mining in enhancing administrative automation, while Fähndrich (2023) notes that digital technologies accelerate the evolution of management control systems, driving greater automation. In auditing, AI and data analytics automate repetitive tasks, allowing auditors to focus on complex responsibilities (Almufadda and Almezeini, 2022; Mugwira, 2022). This reduces human error and enhances audit speed and accuracy. Technologies like NLP further improve these processes by analyzing large datasets, identifying risks, and extracting insights, which bolsters the reliability of financial assessments.

The MAC and AUD communities explore digital technologies for efficiency gains. Fähndrich (2023) asserts that new management control systems, enhanced through digitalization, improve process efficiency. Technologies such as AI, NLP, big data, continuous auditing, and cloud computing are transforming auditing, achieving remarkable gains in efficiency and accuracy (Eulerich and Kalinichenko, 2018; Almufadda and Almezeini, 2022; Mugwira, 2022; Abu Huson *et al.*, 2024). Continuous auditing systems provide timely financial information with minimal resources, enhancing collaboration between external and internal auditors and optimizing workflows. Additionally, cloud computing facilitates real-time auditing, boosting efficiency (Mugwira, 2022).

The identified benefits from the AUD and Blended communities include precision, real-time access, and intervention. The integration of AI is transforming auditing by reducing error rates and enhancing precision and reliability (Almufadda and Almezeini, 2022). Blockchain further enhances precision by transforming traditional audits into automated, timely assurance systems. When integrated with continuous auditing systems, blockchain reduces manual tasks like data extraction and streamlines the delivery of assurance services (Han *et al*., 2023).

Digital technologies are also reshaping auditing by offering real-time access and intervention to financial data. Cloud-based systems enable near real-time anomaly detection and remote performance monitoring, allowing clients to concentrate on value-added activities (Moll and Yigitbasioglu, 2019; Mugwira, 2022). Moreover, big data and blockchain enhance financial visibility, enabling timely interventions (Moll and Yigitbasioglu, 2019; Agustí and Orta-Pérez, 2023). By automating tasks like data extraction and audit preparation (Han *et al.*, 2023), these technologies ensure transparency and accuracy in financial transactions.

The incorporation of digital technologies in accounting and auditing processes presents significant challenges that require careful attention. A key issue is the regulatory landscape, where unclear standards for automation (Parycek *et al.*, 2024 - FAC) and ambiguous blockchain regulations (Mugwira, 2022 - AUD) complicate auditability. This situation highlights the need for solid frameworks, particularly for small and medium-sized enterprises in emerging economies (Belahouaoui and Attak, 2024 - TAX).

Governance structures are crucial, as they are necessary to oversee AI-driven decision-making and mitigate risks such as fraud and a lack of transparency. Recommendations from the AUD and Blended communities include establishing formal governance processes (Almufadda and Almezeini, 2022), creating independent audit committees (Agustí and Orta-Pérez, 2023; Abu Huson *et al.*, 2024), and forming intra-firm governance committees (Lehner *et al.*, 2022). These measures promote the adoption of ethical guidelines and proactively address potential risks.

Data quality is another crucial concern that FAC, AUD, and Blended communities have all addressed. The reliability of outcomes produced by ML (Parycek *et al.*, 2024), AI, and data analytics (Almufadda and Almezeini, 2022; Lombardi *et al.*, 2023) heavily relies on the availability of accurate, complete, and unbiased input data. Poor data quality can compromise audit results, amplify biases, and lead to misleading analyses. Therefore, it is essential to ensure appropriate data usage and conduct thorough assessments of AI-generated insights to prevent misuse or misinterpretation (Moll and

Yigitbasioglu, 2019). Explainability emerges as a significant challenge for the Blended and FAC communities, as the intricate nature of AI systems often obfuscates their decision-making processes. This lack of transparency can obscure instances of suboptimal performance (Fisher *et al.*, 2016; Parycek *et al.*, 2024).

Four distinct communities identify four specific challenges that may also be relevant to others: ethics (Blended), bias and judgment (AUD), and the limitations of processing power, including detectability and controllability (MAC). Ethical concerns, as highlighted by Mancini *et al.* (2021), are intricately connected to the algorithms that underpin AI and big data, often exacerbating these issues (Lehner *et al.*, 2022). Additionally, biases introduced by AI systems can influence audit judgments, underscoring the necessity for frameworks that clarify the relationships between data characteristics, biases, and audit quality, as proposed by Lombardi *et al.* (2023). Finally, technological constraints, such as the Bremermann limit on processing power and the inherent limitations in the detectability and controllability of complex AI systems, pose significant challenges to their effective implementation in auditing (Losbichler *et al.*, 2021).

In communities of practice, the integration of digital technologies within *Economia Aziendale* processes results in a range of effects that are perceived both as opportunities and challenges. One notable advantage is the enhancement of transparency and accountability, particularly through the implementation of blockchain technology. This mechanism offers secure, auditable, and immutable transaction records (Mugwira, 2022). Blockchain facilitates real-time access to comprehensive accounting data, permitting stakeholders to collaboratively verify transactions (Han *et al.*, 2023). As a result, it reduces information asymmetry and curtails opportunistic behaviors (Moll and Yigitbasioglu, 2019). Nevertheless, some challenges must be addressed, especially concerning the lack of transparency in algorithmic decision-making and the potential risks of manipulation and privacy violations associated with other technologies, such as AI and ML (Lehner *et al.*, 2022; Parycek *et al.*, 2024).

In the context of privacy and security, particularly within the AUD, Blended, and FAC communities, blockchain technology enhances data integrity and reduces the risk of fraud by implementing smart contracts (Mugwira, 2022). However, it also raises concerns about the validation of potentially fraudulent information that may be uploaded to the blockchain (Mugwira, 2022; Abu Huson *et al.*, 2024). Furthermore, cyberattacks and the anonymity associated with specific blockchain applications can present reputational and legal risks, underscoring the necessity for robust safeguards

and human oversight in processes that involve uncertainty (Moll and Yigitbasioglu, 2019; Almufadda and Almezeini, 2022). Additionally, Parycek *et al.* (2024) emphasize the importance of exercising discretion in certain administrative procedures that cannot be completely automated.

The cost implications of these technologies present both opportunities and challenges. While cloud computing offers the advantage of reduced infrastructure costs and democratizes access to advanced tools, especially for small and medium enterprises (Moll and Yigitbasioglu, 2019), the significant setup, maintenance, and consulting fees related to systems such as continuous auditing and blockchain remain substantial barriers (Almufadda and Almezeini, 2022; Mugwira, 2022). Despite these costs, the potential return on investment is a key consideration that Connell (1987) recommends evaluating, not only for expert systems but also for broader technology adoption.

5.3.3 Effects on professionals and users

The adoption of digital technologies, including cloud computing, AI, big data, blockchain, and the Internet of Things, is reshaping the accounting profession and creating new opportunities for professional legitimacy. This transformation is supported by three communities of practice, Blended, AUD, and MAC, each providing specific examples of new professional spaces. Professional legitimacy can be fostered through vigilant and critical behavior. During the implementation of new technologies, accountants will need to critically evaluate the insights and suggestions provided by these technologies. They should be wary of users who use these technologies in a black-box fashion, disregarding the inner calculative infrastructures and the plasticity of the values produced (Moll and Yigitbasioglu, 2019).

Accountants and auditors play a crucial role in blockchain adoption by providing expertise in fair-value accounting, evaluating intangible assets, assessing depreciation, and distinguishing between types of leases. This technology is expected to create more job opportunities for accounting professionals, who will be tasked with ensuring the authenticity of source documents and the validity of smart contracts. Accountants will play a critical role in generating, executing, and managing these smart contracts. Additionally, auditors will be equipped to take on more complex responsibilities, such as reviewing smart contracts, conducting risk assessments, performing predictive audits, detecting fraud in real-time, verifying signatures, auditing software and algorithms, and analyzing audit compliance (Han *et al.*, 2023).

Digitalization is giving rise to new professional roles, including data scientists (Fähndrich, 2023), strategic accounting analysts, systems integrators, and cybercrime accounting specialists. These positions combine technical skills with financial knowledge (Almufadda and Almezeini, 2022). Financial accountants are now harnessing big data to enhance fair-value accounting and create metrics for intangible assets such as customer bases and human resources, which have traditionally been excluded from balance sheets (Moll and Yigitbasioglu, 2019). Meanwhile, management accountants are utilizing real-time data to refine their reporting and decision-making processes. They are adapting their approaches to gather insights from comprehensive datasets that include information not directly linked to economic transactions, yet crucial for understanding customer preferences and purchasing behaviors.

The integration of digital technologies is further evolving professionals' roles into that of trusted advisors (Mancini *et al.*, 2021), necessitating interdisciplinary skills and partnerships with technical experts (*e.g.*, cryptocurrency and blockchain advisors). As data-driven transparency grows through technologies like big data and the Internet of Things, accountants are increasingly positioned to bridge the gaps between financial and business units. This creates valuable advisory roles that encourage collaboration and foster innovation.

Digital technologies present considerable challenges for professionals and users within various communities of practice (*i.e.*, MAC, AUD, Blended, EDU, TAX, AIS), particularly in terms of skills, human-machine interaction, and emotional resistance. A significant barrier is the growing skills gap among professionals (Moll and Yigitbasioglu, 2019; Almufadda and Almezeini, 2022; Mugwira, 2022; Nielsen, 2022; Fähndrich, 2023; Abu Huson *et al.*, 2024; Belahouaoui and Attak, 2024). Accountants and auditors are increasingly required to possess advanced competencies in areas such as ML, data analytics, and modeling techniques. Unfortunately, many lack the necessary expertise to fully harness these technologies (Almufadda and Almezeini, 2022; Mugwira, 2022; Nielsen, 2022; Fähndrich, 2023).

Challenges such as information overload, data relevance, and pattern recognition significantly impede the effective use of technology (Moll and Yigitbasioglu, 2019). This widening gap highlights the urgent need for ongoing education (De Villiers, 2021) and capacity building, particularly among professionals in small and medium-sized enterprises and emerging economies (Belahouaoui and Attak, 2024). Regarding the skills gap, Sutton *et al.* (2016) provide evidence that supports propositions 5 and 7 of the Theory of Technology Dominance (Arnold and Sutton, 1998). Research

within the fields of tax and auditing indicates that novices may make poorer decisions when utilizing systems that possess greater knowledge than they do (proposition 5). Furthermore, Sutton *et al.* (2016) suggest that reliance on intelligent systems may adversely affect the development of expertise, as users increasingly depend on these technologies for task completion, thereby risking deskilling (proposition 7).

This concern also relates to the interaction between humans and machines. While intelligent systems can enhance decision-making processes, an over-dependence on these technologies can lead to deskilling among professionals and may introduce biases inherent in training data, ultimately influencing future decisions. To address these challenges, it is essential to cultivate a collaborative relationship between humans and intelligent systems, one in which neither side dominates (proposition 6 of the Theory of Technology Dominance). Such collaboration can improve decision-making outcomes through a combination of human oversight and machine support (Connell, 1987; Sutton *et al.*, 2016; Moll and Yigitbasioglu, 2019). For example, augmented intelligence provides a balanced approach that complements human judgments with AI forecasts, thereby preventing total reliance on automated systems (Losbichler *et al.*, 2021).

Behavioral and cognitive barriers also affect the adoption of technologies. Concerns regarding the complexity and reliability of technologies, such as big data and AI, generate negative emotions and reluctance among management accountants and auditors (Fähndrich, 2023; Lombardi *et al.*, 2023).

5.3.4 Effects on students

As students in the field of *Economia Aziendale*, it is crucial to prepare for future professional roles. Communities of practice illustrate the significant impact of digital technologies on the skills and educational backgrounds of these students. Within the EDU community, De Villiers (2021) and Tavares *et al.* (2023) highlight the necessity for both educators and students to proactively update their knowledge and skills in response to evolving industry demands. This transition requires the integration of data analytics into accounting curricula, alongside traditional technical accounting knowledge. By doing so, students can cultivate the competencies required to manage self-service business intelligence systems while effectively utilizing advanced tools like XBRL (Mancini *et al.*, 2021). Additionally, hands-on learning approaches, including interactive technology applications and the development of expert systems, significantly enhance students'

comprehension of complex concepts and better prepare them for real-world challenges (Brown *et al.*, 1995).

The emergence of automation and AI demands a substantial reevaluation of accounting education, with an emphasis on broader competencies. De Villiers (2021) presents a model that prioritizes critical thinking, problem-solving, creativity, collaboration, ethical conduct, and lifelong learning to effectively navigate the rapidly evolving technological landscape. In a similar vein, the concept of Education 5.0 advocates for curricula designed to equip students with the essential skills required in the era of advanced accountants who excel in utilizing and managing state-of-the-art technologies (Tavares *et al.*, 2023).

To meet the rising demand for information technology expertise, the AUD community recommends incorporating information technology knowledge into Certified Public Accountant exams and undergraduate accounting information systems courses. This integration should encompass areas such as information technology controls, auditing practices, data modeling, and analytics (Almufadda and Almezeini, 2022). Additionally, Agustí and Orta-Pérez (2023) emphasize the importance of embedding AI and big data training into educational programs, preparing the next generation of professionals for a complex, technology-driven environment.

6. Future research directions

Through the framework of results, we have identified both the antecedents and common effects, encompassing potentials and challenges, across different communities, along with unique themes within specific ones. By critically examining the findings and future directions of each literature review and comparing them across different communities of practice, we can uncover several avenues for future research. Digital transformation is a defining feature of both the current and future professional and business landscapes.

Collaboration among communities of practice within the *Economia Aziendale* domain is essential for effectively addressing the potential and challenges posed by digital technologies, as well as for engaging professionals and institutions. While not every theme necessitates collaborative analysis, there is considerable potential to create spaces for in-depth exploration within individual communities, drawing on insights from other groups. Consequently, we propose seven promising research directions

that integrate the analysis of antecedents and effects related to digital technologies.

6.1 Call for practical applications

Current research, as highlighted by literature reviews in various communities of practice, especially AUD and MAC, emphasizes the importance of exploring the practical applications of digital technologies (Eulerich and Kalinichenko, 2018; Almufadda and Almezeini, 2022; Mugwira, 2022; Nielsen, 2022; Fähndrich, 2023) across diverse organizations and different countries. The adoption of digital technologies in certain industries is influenced by specific demand factors, along with country-specific barriers (*e.g.*, bureaucratic inefficiencies and resource scarcity), which can impede large-scale implementation in emerging economies. These applications foster a body of evidence that transcends predictive or theoretical approaches, making them relevant in real-world contexts. *Economia Aziendale*, in particular, is a practical field that continuously faces new challenges from the business environment. The emphasis on practice-oriented publications serves to strengthen the connection between scientific research and its practical applications.

Qualitative investigations (*e.g.*, field studies, interviews) are encouraged (Eulerich and Kalinichenko, 2018; Almufadda and Almezeini, 2022; Agustí and Orta-Pérez, 2023; Fähndrich, 2023; Senave *et al.*, 2023) for their ability to yield in-depth insights into the ongoing organizational changes and users' perceptions resulting from technology development and adoption. Field studies and interviews are particularly recommended for these purposes. Additionally, quantitative studies (Abu Huson *et al.*, 2024) are crucial for evaluating the antecedents of digital technologies and their effects on business processes and professionals. Experiments and data collection through surveys can effectively address these types of inquiries.

6.2 Theoretical roots

We believe that encouraging practice-oriented investigations is important, but it is equally vital to understand these empirical insights through appropriate theoretical frameworks. In this context, the Blended community advocates for the application of agency theory to enhance transparency and mitigate information asymmetry among users. Additionally, stakeholder theory can be employed to analyze stakeholder engagement and collaboration in exploring blockchain applications (Han *et al.*, 2023). Furthermore, the MAC community highlights that theoretical frameworks

such as neo-institutional theory, structuration theory, actor-network theory, and configuration theory can provide valuable insights into the organizational transformations resulting from the adoption of digital technologies (Losbichler and Lehner, 2021; Fähndrich, 2023). The AUD community advocates for the use of agency theory to examine the dynamics between humans and machines (Lombardi *et al.*, 2023). Moreover, investigations that adopt interpretive and critical perspectives could also yield additional valuable insights.

6.3 Digital technologies implementation

In the literature on management accounting and control, particularly within the research stream of management accounting change, the implementation of systems is a central focus. There is a growing call for empirical studies that can deepen our understanding of how digital technologies are implemented, viewed through the lens of broader organizational change (Moll and Yigitbasioglu, 2019). The AUD, Blended, and FAC communities of practice offer several key future directions regarding the implementation of these digital technologies. As Eulerich and Kalinichenko (2018) indicate, continuous auditing necessitates a more thorough exploration of the factors driving its adoption. Successful implementation seems to depend on organizational readiness, ecosystem support, and a strong commitment to encouraging a willingness to adopt these technologies (Agustí and Orta-Pérez, 2023). However, there is still much to explore.

Researchers should investigate the roles of various stakeholders and the essential capabilities required to integrate digital tools into existing accounting workflows (Moll and Yigitbasioglu, 2019; Mancini *et al.*, 2021). Furthermore, studies on AI and ML in accounting should prioritize ethical considerations and the societal values that inform the deployment of digital technologies (Han *et al.*, 2023). Lastly, Kureljusic and Karger (2024) recommend utilizing design science research to tackle the implementation and maintenance of forecasting models, taking into account human factors, and enhancing the technical, organizational, and human integration of information systems artifacts.

6.4 Working on new systems

Future research on emerging digital technology systems should concentrate on their applications for specific tasks and processes within

various communities of the *Economia Aziendale* domain. For instance, digital technologies such as NLP, enhanced by AI and ML, hold promise for enhancing continuous auditing processes, improving financial analysis accuracy, and screening high-risk employees, as highlighted by the Blended community (Fisher *et al.*, 2016; Moll and Yigitbasioglu, 2019). Furthermore, the capability of blockchain to transform management accounting tasks, including planning, control, and benchmarking, through its immutable ledger merits thorough exploration (Moll and Yigitbasioglu, 2019). Future studies should also investigate how NLP can effectively integrate both quantitative and qualitative financial data to fully realize its promise (Fisher *et al.*, 2016).

The advancement of management accounting and control systems incorporating these digital technologies presents another rich avenue for research. Practice-oriented approaches may lead to the development of tailored systems that address various organizational characteristics, such as size, industry, and ownership (Fähndrich, 2023). Additionally, ML offers an expansive research frontier for management accounting, enabling sophisticated prediction and decision-making techniques while utilizing unstructured data to enhance estimates and facilitate explainable AI for model interpretation (Nielsen, 2022; Ranta *et al.*, 2023).

Big data, blockchain, and cloud auditing are fundamentally transforming the processes of gathering and analyzing audit evidence. For the AUD community, important questions remain about how to effectively integrate these technologies into traditional systems while ensuring the protection of client data (Mugwira, 2022). In the realm of fraud detection and risk assessment, optimizing ML algorithms and exploring NLP applications for analyzing company disclosures and social media data stand as pivotal areas for both the Blended and FAC communities (Agustí and Orta-Pérez, 2023; Senave *et al.*, 2023). Additionally, the use of contextual text embedding models and cosine similarity measures may reveal new opportunities for identifying fraudulent reporting (Senave *et al.*, 2023).

In the TAX community, research should focus on the challenges of achieving digital tax compliance, particularly within small and medium-sized enterprises in emerging economies. It is also essential to explore the transformative roles of AI and blockchain technology in tax administration (Belahouaoui and Attak, 2024). Investigating the behavioral effects of tax digitalization and its distinct implications across various contexts can yield valuable insights into compliance dynamics.

6.5 Challenges and pitfalls of using digital technologies

Recently, there has been an increasing focus on the unaccounted effects of digital transformation within research. Authors in this area are striving to comprehend the significant individual, organizational, and societal challenges that, due to digital technologies, often remain unaccounted for (Argento *et al.*, 2025). A special issue recently published in the Accounting, Auditing & Accountability Journal addresses this topic; however, further research is still needed. In particular, Blended and AUD communities of practice require further exploration of the challenges and risks associated with the use of digital technologies.

One crucial area for investigation is the integration of technologies such as cognitive computing, cloud-based systems, and blockchain, particularly in terms of biases, risks, and governance structures (Moll and Yigitbasioglu, 2019). Additionally, empirical studies are crucial for assessing the pre- and post-implementation impacts of AI subfields, such as ML and NLP, on auditing processes and organizational outcomes (Almufadda and Almezeini, 2022).

Although existing frameworks for continuous auditing have been developed, experimental research remains limited, particularly in terms of efficiency, cost-benefit analysis, and the impacts on management behavior (Eulerich and Kalinichenko, 2018; Mugwira, 2022). Future inquiries should also address the challenges of adopting blockchain and cloud computing, focusing on technical, organizational, and legal complexities (Han *et al.*, 2023), as well as issues related to data security and financial reporting risks (Moll and Yigitbasioglu, 2019).

There is also an urgent need for regulatory and ethical frameworks that ensure privacy and responsible use of AI, integrating perspectives from humanistic, legal, and information sciences disciplines (Han *et al.*, 2023; Parycek *et al.*, 2024). Furthermore, it is essential to explore the ethical implications of AI usage and its effects on organizational roles and processes to establish future standards in management accounting and auditing (Losbichler and Lehner, 2021). Finally, the relationship between technology and auditor judgment warrants investigation, particularly in mitigating biases that technological systems may exacerbate, through collaboration among researchers, regulators, and practitioners (Mugwira, 2022; Lombardi *et al.*, 2023).

6.6 The future of professionals

As we find in most of our reviews, the legitimacy of professionals operating within the domain of *Economia Aziendale* is increasingly undermined by the adoption of digital technologies. This challenge extends beyond the individual practitioner to encompass the professional bodies that govern these fields (Moll and Yigitbasioglu, 2019). Consequently, it is imperative for future research to investigate the evolving roles, competencies, and identities of practitioners as digital technologies transform their responsibilities and images. This inquiry into competencies is intrinsically linked to the distinctive characteristics of various digital technologies, while also inviting broader research questions focused on roles and professional identities.

Identifying the competencies requisite for professionals to effectively leverage ML and respond to insights derived from AI constitutes a critical area of research (Sutton *et al.*, 2016). It is essential that the development of digital skill sets and curriculum updates for both current and future accounting professionals align with emergent technologies, such as blockchain and big data, to ensure their continued relevance within the profession (Moll and Yigitbasioglu, 2019; Mancini *et al.*, 2021; Agustí and Orta-Pérez, 2023). Field studies aimed at cultivating digital competencies and enhancing understanding of human-machine interactions are likely to yield valuable insights into preparing management accountants for these advancements (Nielsen, 2022; Fähndrich, 2023).

While our findings reveal numerous potential avenues for fostering the development of future professionals, further scholarly inquiry is warranted. The automation of specific tasks engenders tensions among professionals and challenges established boundaries within each profession. This phenomenon may have implications not only for existing professions but also for the emergence of new ones. For instance, the rising prominence of data scientists and systems developers can be observed in the context of digital technology adoption. Therefore, a more nuanced understanding is necessary to explore the conflicts, collaborations (Mugwira, 2022), and sources of power that exist within organizational settings as well as among professional bodies. As the boundaries of professions continue to evolve, substantial opportunities for innovative business models and novel services offered by financial accountants and external auditors merit further examination (Moll and Yigitbasioglu, 2019).

6.7 The role of higher education institutions

Higher education institutions must actively fulfill their social responsibilities in the digital technology era. This entails a critical examination of educational programs, pedagogical approaches, and assessment methods for competencies. Future research, particularly within the EDU community of practice, should investigate how these institutions can adapt their curricula to align with technological advancements and effectively prepare graduates for the evolving demands of the professional landscape (Sutton *et al.*, 2016; Moll and Yigitbasioglu, 2019). A key focus should be the evaluation of established frameworks, such as De Villiers' (2021) seven-competencies model, to ascertain their relevance in equipping students with the lifelong learning capabilities and adaptability necessary to navigate uncertainties.

Moreover, higher education institutions must address the ongoing educational needs of alumni through reskilling initiatives (De Villiers, 2021; Tavares et al., 2023), particularly given the modern workplace's increasing emphasis on competencies such as creativity, teamwork, problem-solving, critical thinking, and communication. Ethical considerations surrounding the integration of AI in education, alongside innovative pedagogical strategies, are paramount to preparing graduates with the requisite technical and cognitive skills essential for success in a digitally advanced society (De Villiers, 2021). Additionally, fostering collaboration between academia and professional accounting and management bodies (*e.g.*, ICAEW, ACCA, CPA Australia, CIMA, and IMA) will be vital in bridging existing gaps and developing programs that meet the technological and societal demands of the future (Moll and Yigitbasioglu, 2019; Mancini et al., 2021).

7. Implications

This paper presents an integrative review of existing literature reviews concerning digital technologies in the domain of *Economia Aziendale*. While numerous literature reviews have addressed this topic (*e.g.*, Lombardi *et al.*, 2021; Valentinetti and Rea, 2023), this study represents the first systematic effort in this direction to our knowledge. As argued by Sutton *et al.* (2016), specific communities of practice, such as the AIS community, seem to operate in relative isolation from the mainstream of *Economia Aziendale*. This isolation is similarly observed in the TAX and EDU communities, which are typically discussed in specific journals. Despite this separation,

our analysis identifies specific aspects and several common themes within the literature reviews. Accordingly, this study aims to integrate insights from diverse academic communities regarding the discourse surrounding digital technologies in *Economia Aziendale*.

To derive meaningful theoretical implications, it is essential for each community of practice to thoroughly investigate the technologies that are most pertinent to their specific processes and activities. Therefore, there is a need for practice-oriented studies alongside the development of theoretical reflections grounded in empirical cases of technology development and implementation within organizations. Our research will empower scholars in this field to leverage a wealth of existing studies, thereby enriching their future inquiries and fostering more significant discussions about the influence of digital technologies on businesses, professions, and society.

Practitioners can obtain valuable guidance on effectively leveraging digital technologies and navigating the associated opportunities and challenges within their businesses and professions. Furthermore, policymakers can develop informed strategies for managing the complexities of digital technology integration and its broader societal implications, drawing from the findings of this research.

8. Limitations and suggestions for future reviews

The present contribution has a few limitations that could be addressed by future studies. First, we only identified communities of practice based on the content authors explored in their literature reviews, without considering the relationships between authors who study digital technologies. Second, we defined the boundaries of *Economia Aziendale* by selecting specific keywords in our search strategy, aligning it with disciplines such as financial accounting, management accounting and control, auditing, tax, strategy, and entrepreneurship. It would be interesting to monitor its evolution, as to the best of our knowledge, we did not find literature reviews in all the communities associated with these disciplines (*e.g.*, strategy, entrepreneurship). Third, we were unable to verify any temporal overlaps between the articles cited by each individual review, as only some of the literature reviews clearly cited the articles they had analyzed.

Future literature reviews stand to gain significantly from the integration of digital technologies. However, it is crucial for researchers to possess a solid understanding of these systems to effectively engage with them and produce high-quality results. The application of AI, for instance, can

minimize human errors caused by fatigue or distraction, leading to greater consistency by reducing variability in research interpretation. Moreover, AI can function as a supplementary resource, providing an additional layer of precision to research protocols without necessitating extra time, resources, or funding. Researchers can employ AI tools for literature reviews to swiftly identify relevant papers and articles for analysis (*e.g.*, Burger et al., 2023).

Moreover, based on our analysis, we advocate for the creation of specific typologies of literature reviews to define clear objectives and methodologies. This not only clarifies the researcher's contributions but also aligns them with the expectations of the academic community. As discussions surrounding digital technologies continue to develop, it becomes imperative to formulate reviews with targeted objectives that address particular aspects of each community of practice, as well as overarching themes that link various communities. This approach will enable researchers to gain a deeper understanding and facilitate meaningful comparisons of different implications. The seven future directions articulated in this integrative review can serve as valuable guidance also for literature reviews in the coming years.

The references listed below correspond to the literature reviews analyzed in our integrative review. Additional references cited in the paper are accessible at the following link: www.sidrea.it/digital-technologies-economia-aziendale.

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Appendix A – Digital technologies' definitions

Appendix A is accessible via the following link: www.sidrea.it/digital-technologies-economia-aziendale.