The unaccounted effects of digital transformation: implications for accounting, auditing and accountability research

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Abstract

Purpose – This paper aims to uncover the unaccounted effects of digital transformation on accounting, auditing and accountability. It explores the extant academic research and introduces the AAAJ Special Issue titled *Accountability for a Connected Society: the Unaccounted Effects of Digital Transformation*.

Design/methodology/approach – A methodological approach combining bibliometric analysis techniques with a qualitative literature review was used to explore relevant academic research. This approach facilitates the identification of thematic clusters within the literature and supports the subsequent qualitative analysis of the studies within each cluster. The qualitative literature review employed an analytical model grounded in organisational science literature, focusing on three predominant levels of analysis: individual, organisational and societal.

Findings – The bibliometric analysis technique led to the identification of seven thematic clusters covering the impact of digital transformation on (1) accounting; (2) adoption, accounting education and e-government; (3) management control; (4) auditing and the auditing profession; (5) public sector auditing and digital technologies; (6) digital innovations for a sustainable future; and, finally, (7) digital trust and cybersecurity. The subsequent qualitative literature review of the papers belonging to each thematic cluster led to an integration of those themes into three macro-clusters: accounting, auditing and accountability.

Originality/value – This work's innovative combination of methods, including bibliometric and manual techniques, enhances its ability to identify key research topics and uncover further research directions. Several promising directions are suggested for future research.

Keywords Digital transformation, Multilevel framework, Bibliometric review, Accounting, Auditing, Accountability

Paper type Research paper

1. Introduction

Digital technologies profoundly transform organisations, governance and society, creating opportunities for increasing efficiency, transparency and connectivity. However, these advancements come with significant individual, organisational and societal challenges that often remain unaccounted for. Digital transformation is defined as "novel actors (and actor constellations), structures, practices, values and beliefs that change, threaten, replace or complement existing rules of the game within organisations, ecosystems, industries or fields" (Hinings *et al.*, 2018, p. 53). Far beyond mere technological advancement, digital transformation is recognised as a critical form of institutional change for addressing the dynamic needs and expectations of a globalised, digitally oriented society (Kraus *et al.*, 2022). Digital transformation introduces both unprecedented opportunities and novel challenges for professionals navigating the evolving landscape (Susskind and Susskind, 2015). It has been shown to reshape organisational structures and practices, alter decision-making processes and introduce issues such as algorithmic bias, data privacy concerns and unequal access to digital services. While some sectors benefit from enhanced service delivery and agility, others face exclusion due to technological divides, low digital literacy and limited infrastructure. The COVID-19 pandemic, for instance, highlighted both the potential and pitfalls of digital solutions, as online tools enabled remote work and education but also amplified mental health challenges, isolation and systemic inequalities. These unintended consequences underline the dichotomous nature of digital transformation as both an enabler of progress and a source of disruption.

In recent years, scholars have devoted significant attention to the role of digital transformation in the domain of accounting, auditing and accountability, acknowledging that digital technologies represent a paradigmatic shift and influence accounting and auditing work (e.g. Kokina and Davenport, 2017; Moll and Yigitbasioglu, 2019; Lehner *et al.*, 2022; Yigitbasioglu *et al.*, 2023; Sonnerfeldt and Jonnergård, 2024). Several literature reviews have already been published examining the connection between digital transformation and different accounting domains, such as accounting, management accounting and public sector auditing (Knudsen, 2020; Grossi *et al.*, 2023; Jans *et al.*, 2023; Leocádio *et al.*, 2025; Arkhipova *et al.*, 2024; Lombardi and Secundo, 2020).

While digital transformation offers numerous opportunities for innovation and efficiency, its darker side poses significant challenges for organisations, individuals and societies. Although digital technologies promise improved service delivery and engagement (Mora and Deakin, 2019; Spicer *et al.*, 2021), they often exacerbate existing inequalities, leaving under-served segments of society excluded due to low literacy, income disparities or geographical restrictions (Wang *et al.*, 2021). Furthermore, the adoption of digital tools has triggered unforeseen psychological consequences, such as feelings of loneliness and mental health issues stemming from constant connectivity and social media use (Andrew *et al.*, 2020; Montag and Elhai, 2020). These adverse effects highlight the dichotomous nature of digital transformation, where progress coexists with growing digital divides and social injustices (Hinings *et al.*, 2018). Moreover, the pressure to embrace agility and experimentation in organisational cultures has created additional complexities, such as data management challenges and conflicts between open data advocacy and privacy concerns, exemplified by general data protection regulation (GDPR) (Scott and Orlikowski, 2012; Bhimani and Willcocks, 2014). Accounting practices are also under strain, as organisations must develop

new accountability frameworks to navigate this evolving landscape and establish meaningful dialogues with diverse stakeholders (Unerman and Bennett, 2004; Bellucci and Manetti, 2017). These challenges underscore the need to critically examine the less-visible consequences of digital transformation, ensuring that its benefits do not come at the expense of societal equity and wellbeing. However, despite the growing literature on the unaccounted implications of digital transformation in accounting, auditing and accountability, there is still a need for a systematic overview of this research. By exploring the extant academic literature on digital transformation, this paper aims to uncover the hidden and often overlooked effects of digital transformation on accounting, auditing and accountability. It also offers insights into directions for further research. This analysis responds to the call for papers by this AAAJ Special Issue titled *Accountability for a Connected Society: the Unaccounted Effects of Digital Transformation*, which aims to bridge gaps in understanding and addressing the systemic challenges of digital transformation.

This paper addresses three specific research questions to advance knowledge in this field:

RQ1. What prominent trends and topics are explored in the extant literature concerning the unintended consequences of digital transformation for accounting, auditing and accountability?

RQ2. What are the primary focal points at the individual, organisational and societal levels within the key research topics identified in the literature and the articles included in this AAAJ Special Issue?

RQ3. What future research directions and trends concerning the unintended consequences of digital transformation in accounting, auditing and accountability are outlined in the literature and the articles included in this AAAJ Special Issue?

A systematic literature review was conducted to answer these three research questions, focusing on papers published in ranked journals listed by the Australian Business Deans Council in 2022 (ABCD, 2022) in 2022 and the Chartered Association of Business Schools in 2021 (CABS, 2021). Machine learning tools were applied to assist in grasping the trends and topics covered in the selected literature. The bibliometric analysis technique led to the identification of seven thematic clusters covering the impact of digital transformation on (1) accounting; (2) adoption, accounting education and e-government; (3) management control; (4) auditing and the auditing profession; (5) public sector auditing and digital technologies; (6) digital innovations for a sustainable future; and, finally, (7) digital trust and cybersecurity.

Next, a qualitative literature review of the papers allocated to each cluster was conducted. The analytical framework guiding the qualitative literature review aimed to categorise the impacts of digital transformation into three levels: individual, organisational and societal. At the individual level, the research focus is on the reactions of individuals, highlighting changes in roles, skills and professional practices influenced by digitalisation. Research at the organisational level examines how organisations, as systems, adapt to digital transformation and interact with one another, including shifts in governance, accountability mechanisms and operational processes. Lastly, studies examining the societal level explore the broader influence of digital technologies on society, including their role in shaping social structures, governance and public accountability, and how society drives and responds to the digitalisation process. The qualitative literature review of the papers within each thematic cluster led to an integration of these themes into three macro-clusters: accounting, auditing and accountability.

This paper contributes to the existing literature in several ways. First, it provides an in-depth and up-to-date review of the state and evolution of the fields of accounting, auditing and accountability, outlining primary topics of investigation within the corpus of the reviewed literature. Second, it presents an exhaustive evaluation of the main findings within the identified key themes, offering a comprehensive depiction and critical analysis of the

unaccounted effects of digital transformation that has not been previously undertaken. Finally, the paper provides insights into further research directions concerning accounting, auditing and accountability on each of the three levels of analysis (individual, organisational and societal).

The subsequent sections of the paper are structured as follows: the methodology for the selection and analysis of the extant literature is described in Section 2, followed by a discussion of the results in Section 3. Section 4 provides an overview of the research papers in this AAAJ Special Issue. Section 5 offers a summary and potential directions for future research arising from the reviewed literature and the papers in the Special Issue.

2. Methodology

A systematic literature review process, which was structured and involved multiple stages, was carried out following the approach outlined by Linnenluecke *et al.* (2020) and Massaro *et al.* (2016). Using the *Scopus* database, a comprehensive search was conducted in September 2023, using terms related to "accounting" and "digitalisation", "auditing" and "digitalisation" and "accountability" and "digitalisation". This initial search produced 518 academic publications. To ensure quality, the publications were filtered to only include journals listed in the CABS 2021; ABDC 2022 rankings, resulting in 244 papers published between 2010 and 2023. A PRISMA flow diagram illustrating this process is presented in Figure 1.

To identify the structure of the field, bibliometric analyses were conducted using VOSViewer (v. 1.6.19). Specifically, bibliographic coupling with a resolution of 0.5 and a minimum cluster size of 10 was used, which resulted in 187 connected papers structured into seven distinct clusters. The reduction from 244 to 187 papers reflected the removal of disconnected documents that did not share bibliographic connections with the sample.
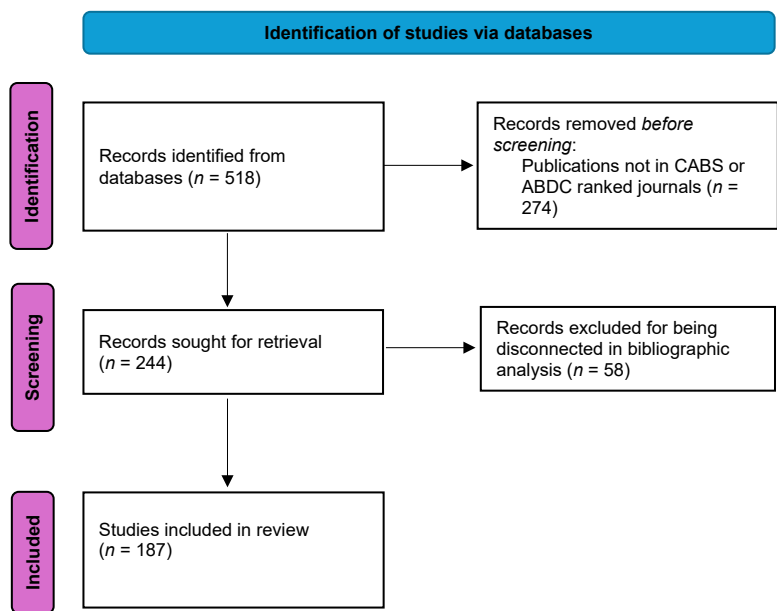
Source(s): Figure created by authors

Figure 1. PRISMA flow diagram

For the analysis of each cluster, a keyword analysis of abstracts, titles and authors was carried out to identify emerging themes. For analytical rigour, each cluster was independently reviewed by two authors. Interpretative disagreements that arose were resolved through collective author discussions, leading to consensus on the final thematic categorisation. Seven thematic clusters were identified, as illustrated in Table 1: (1) accounting; (2) adoption, accounting education and e-government; (3) management control; (4) auditing and the auditing profession; (5) public sector auditing and digital technologies; (6) digital innovations for a sustainable future; and, finally, (7) digital trust and cybersecurity.

Once the clusters were determined, a qualitative literature review of the papers included in each cluster was conducted. The qualitative review focused on three levels of analysis from the organisational science literature – that is, the micro-, meso- and macro-levels (e.g. Bankins *et al.*, 2024). In this paper, the *micro-level* concentrates on outcomes such as digital literacy, psychological wellbeing and behavioural processes. This level scrutinises the influence of digital transformation on personal capacities and community dynamics (i.e. the individual level). *Meso-level* research is situated at the organisational level, encompassing digital strategy and governance. It addresses technological innovation, service delivery efficiency and data management capabilities, thereby highlighting the intra-organisational ramifications of digital transformation. *Macro-level* research explores supra-organisational dimensions, considering societal digital divides, policy consequences and broader accountability issues that arise in an increasingly interconnected global landscape. In essence, the papers were analysed by considering the effects of digital transformation at the individual level (i.e. how individuals react to digital transformation), the organisational level (i.e. how organisations react to digital

Table 1. Thematic clusters

Cluster name	Cluster description
(1) Accounting	Explores the impact of digital transformations on accounting, highlighting the beneficial effects and challenges of advanced digital tools and platforms on accounting practices; also discusses the importance of educational and training programmes
(2) Adoption, accounting education and e-government	Examines the impact of the adoption of digital tools, focusing on its benefits, such as enhanced efficiency, transparency and innovation; also explores challenges like digital fatigue and cognitive overload and challenges to accountability and societal equity
(3) Management control	Examines how digitalisation transforms management accountants' professional roles and identities, pointing out the growing need for adaptability to new technologies and competencies such as data analytics; also explores the transformation of the traditional management accounting function within organisations
(4) Auditing and the auditing profession	Focuses on adopting and using audit technologies, investigating the factors driving their adoption in auditing; also explores the development of digital competencies among accountants and auditors, discussing the role of education in this transition and the need for audit regulation to remain aligned with technological advancements
(5) Public sector auditing and digital technologies	Investigates the impact of digitalisation in public accounting, focusing on the benefits of increased efficiency, transparency and accountability while exploring challenges related to skill development, resistance to change and social inequalities
(6) Digital innovations for a sustainable future	Examines digital innovations and sustainability, focusing on the application of emerging technologies, such as blockchain and intelligent automation, to promote sustainable practices
(7) Digital trust and cybersecurity	Investigates digital transformation, the challenges of data breaches and cybersecurity challenges

Source(s): Table created by authors

transformation) and the societal level (i.e. how society is influenced by and influences digital transformation).

A comparison of the results of the qualitative literature review revealed a number of overlaps, leading to the seven themes being merged into three macro-clusters covering the impact of digital transformation on (1) *accounting* (including accounting, management control, professionals and accounting education), (2) *auditing* (including auditing and the auditing profession) and (3) *accountability* (including adoption, e-government, a sustainable future, digital trust and cybersecurity). The next section presents the results of the literature review categorised according to the three identified macro-clusters.

3. Results of the analysed literature

The findings on the impact of digital transformation at the individual, organisational and societal levels within the identified macro-clusters are depicted below (Table 2).

Table 2. Overview of macro-clusters

Cluster name	Cluster description
(1) Impact of digital transformation on accounting (resulting from previous clusters 1, 3 and 5)	Explores the impact of digital transformations on accounting, highlighting the beneficial effects and challenges of advanced digital tools and platforms on accounting practices. It also examines how digitalisation in management accounting transforms individual management accountants' professional roles and identities, demonstrating the growing need for adaptability to new technologies and competencies such as data analytics
	In addition, it investigates the impact of digitalisation in public sector accounting, focusing on the benefits of enhanced efficiency, transparency and accountability, while exploring challenges related to skill development, resistance to change, and social inequalities
(2) Impact of digital transformation on auditing (resulting from previous clusters 4 and 5)	Focuses on adopting and using audit technologies, investigating the factors driving their adoption in auditing. The cluster explores the development of digital competencies among auditors, discussing the role of education in this transition and the need for audit regulation to remain aligned with technological advancements
	It also investigates the impact of digitalisation in public sector auditing, focusing on the benefits of increased efficiency, transparency and accountability, while exploring challenges related to skill development, resistance to change and social inequalities
(3) Impact of digital transformation on accountability (resulting from previous clusters 2, 5, 6 and 7)	Examines the impacts of digital transformation across individuals, organisations and societies, focusing on its accountability benefits, such as increased efficiency, transparency and innovation. It also explores challenges like digital divides, algorithmic bias and challenges to accountability and equity
	Finally, it investigates digital innovations and sustainability, focusing on the application of emerging technologies, such as blockchain and intelligent automation, to promote accountability, the challenges of data breaches and cybersecurity challenges

Source(s): Table created by author

3.1 Macro-cluster 1 – accounting
The first macro-cluster examines the impact of digital transformations on (management) accounting by focusing on various change dimensions: the evolution of (management) accounting practices, the transformation of professional roles, modifications in organisational structures, the development of ethical guidelines and new regulatory frameworks and the need for innovative educational approaches. The papers included in this macro-cluster highlight both the positive effects and the challenges of advanced digital tools and platforms.

From an organisational-level perspective, the existing literature stresses that digital transformations are marked by the adoption of technologies such as robotic process automation (RPA), blockchain, artificial intelligence (AI) systems and digital reporting tools. These technologies are streamlining accounting processes and improving the efficiency and accuracy of financial reporting (Troshani *et al.*, 2018; Wilkinson *et al.*, 2018), pushing a paradigm shift (Carter *et al.*, 2015) from traditional accounting methods to more automated and transparent practices (Quinn *et al.*, 2016; Pemer, 2021; Zhang *et al.*, 2022, 2023; Donald *et al.*, 2023; Fülbier and Sellhorn, 2023; Pericolo *et al.*, 2023; Thanh Hoai and Nguyen, 2023).

Kokina and Blanchette (2019) examined the early stages of RPA adoption and highlighted the role of robotics in automating repetitive tasks, leading to cost savings, lower error rates and improved process documentation. Automation increases efficiency and allows accounting professionals to focus on more strategic and value-added activities. Similarly, digital reporting tools such as eXtensible Business Reporting Language (XBRL) have made financial reporting more efficient and transparent, enabling better stakeholder engagement. This shift towards digital reporting underscores the broader move towards standardised, accessible and verifiable accounting data (Troshani *et al.*, 2018).

Digital technologies such as FinTech innovations and blockchain significantly transform accounting practices by increasing operational efficiency and reducing costs. These technologies integrate various systems and databases, creating unified hubs for business insights that streamline processes and improve client understanding (Al-Okaily *et al.*, 2024). In particular, blockchain provides immutable and transparent ledgers, which ensure tamper-resistant transaction records and reduce ledger maintenance and reconciliation costs (Pflueger *et al.*, 2022). Additionally, digital accounting tools facilitate real-time accounting, speed up transaction settlements and increase data security and control, ultimately improving existing accounting processes (Pflueger *et al.*, 2022).

However, digital transformation necessitates significant organisational change beyond technical implementation (Plesner *et al.*, 2018; Richardson *et al.*, 2018; Manita *et al.*, 2020; Fang *et al.*, 2023). The integration of digital technologies demands innovation in business models, performance metrics, operational practices and approaches to leadership and governance (Plesner *et al.*, 2018; Li *et al.*, 2023). Visionary leadership can leverage digital transformations to elevate accounting practices and governance, underscoring leaders' strategic role in steering organisational change towards embracing digital opportunities (Thanh Hoai and Nguyen, 2023). Finally, Pemer and Werr (2023) highlighted the importance of organisational strategies to cope with the continuous need for learning and skill development within organisations in order to keep the workforce engaged and proactive in the digital transformation journey.

At the individual level, digital transformations require accounting professionals to develop new skills and competencies, and they are contributing to transforming professional identities and organisational cultures (Richardson *et al.*, 2018; Manita *et al.*, 2020; Pemer, 2021). This evolution has led to the emergence of roles that integrate technological proficiency with accounting knowledge, necessitating both technical and strategic skills to harness digital tools effectively (Whyte and Lobo, 2010; Quinn *et al.*, 2016; Yapa *et al.*, 2017). Accountants are transitioning from their conventional bookkeeping and financial reporting roles to becoming strategic advisors. They can now leverage digital tools for data analysis and strategic planning, underscoring the critical role of digital technology in achieving organisational success (Richardson *et al.*, 2018).

However, updating competencies requires a system-level change in shaping educational and training programmes (Quinn *et al.*, 2016; Richardson *et al.*, 2018; Pemer, 2021). These transformations generate a pressing need for curricular reforms (Wilkinson *et al.*, 2018; Pericolo *et al.*, 2023) to narrow the gap between current education and actual requirements (Pericolo *et al.*, 2023). The integration of digital skills into accounting education is expected to extend beyond the addition of new courses, as it requires a fundamental reassessment of teaching methods and curriculum design to prepare professionals for the challenges presented by digital advancements. For instance, research has highlighted the case of Australia, where Wilkinson *et al.* (2018) detected a strong push to include digital technologies, statistical knowledge and hands-on experiences in accounting programmes. However, researchers have also highlighted the crucial role of ongoing professional development, emphasising the significance of lifelong education, continuous learning and adaptation among accounting professionals. This development is essential in order for accountants to maintain relevance in an increasingly technology-driven profession (Wilkinson *et al.*, 2018).

Some research uncovers how digital transformation affects individuals' perceptions, behaviours and skill development, particularly in educational and training contexts. Concerning personal perceptions of technology adoption, Sugahara *et al.* (2024) found that students perceiving accounting as a decision-making tool are more likely to embrace cloud accounting technologies. This highlights the importance of framing digital tools as enablers of critical thinking and practical problem-solving in order to increase acceptance and usage. Another key insight is the diversity in individual adoption patterns, influenced by innovation profiles and prior experiences. Beukes *et al.* (2018) revealed that students categorised as innovators or early adopters reported higher perceived benefits from technologically enhanced learning, while slower adopters were less engaged. This finding points to the need for tailored approaches in educational settings in order to address varying levels of digital readiness and motivation. Additionally, Wilkin (2022) highlighted the value of structured, task-based learning in developing critical reflection and analytical skills, showing that carefully designed educational interventions can mitigate the potential for digital tools to reduce independent thinking.

From the societal-level perspective, while digital transformation offers numerous benefits, it also introduces ethical and regulatory challenges. For instance, the integration of AI and machine learning technologies enhances accounting practices, but raises questions about data security, privacy and accountability (Zhang *et al.*, 2023). Addressing these challenges requires the development of robust ethical guidelines and new regulatory frameworks, which can ensure that the implementation of digital technologies in accounting maintains high ethical standards – a concern echoed across several studies (Carter *et al.*, 2015; Plesner *et al.*, 2018; Pemer, 2021). Also, the push for digital disclosures and standardised reporting can conflict with the preference for principle-based accounting, influencing the development of taxonomies that computers can read (Rowbottom *et al.*, 2021).

The reviewed literature pertaining to management accounting mainly discussed the impact of digitalisation at the individual and organisational levels, with only a minor focus on societal impacts. At the individual level, three main topics emerged. The first topic concerns how digitalisation is reshaping management accountants' professional roles and identity. Digitalisation is leading to the emergence of new roles, responsibilities and skill requirements and to the building of new professional identities (Möller *et al.*, 2020; Fähndrich, 2023; Goretzki *et al.*, 2023). This transformation includes adapting to new technologies, collaborating with data scientists and incorporating business analytics into traditional accounting practices (Heinzelmann, 2018; Möller *et al.*, 2020; Goretzki *et al.*, 2023). New roles do not necessarily imply that technology will fully substitute for humans in accounting tasks, as complete technology substitution remains unlikely due to the significance of professional intuition and tacit knowledge (Arnaboldi *et al.*, 2022). However, the increased use of information technology (IT) systems in management accounting changes how accountants see themselves and their work, causing conflicts between traditional tasks and

new expectations and leading to a gap between what management accountants want and do (Heinzelmann, 2018). New roles and their hybridity provoke mixed feelings (Garbowski *et al.*, 2021; Fähndrich, 2023).

The second topic refers explicitly to skill development and competency. There is a growing emphasis on the need to develop digital technology skills, such as proficiency in data analytics, artificial intelligence, blockchain and cloud computing (Mat Ridzuan *et al.*, 2022; Fähndrich, 2023). Effective communication and social skills are also critical to ensure the effective functioning of management accountants in organisational structures that are becoming increasingly horizontal due to the growing implementation of digital technologies (Fähndrich, 2023). These skills are essential for practical fraud risk assessment (Mat Ridzuan *et al.*, 2022), decision-making (Bhimani, 2020; Korhonen *et al.*, 2021) and value creation in the digital realm. However, the successful adoption of information and communication technology (ICT) presents challenges such as misalignment with current business practices, necessary digital skills, implementation costs and managerial conservatism (Millán *et al.*, 2021).

The third topic is related to the challenges and opportunities of digitalisation. While digitalisation presents opportunities for automation, efficiency and improved decision-making, it also poses challenges such as maintaining data quality (Möller *et al.*, 2020), ensuring accountability and managing the division of labour between humans and machines (Korhonen *et al.*, 2021; Arnaboldi *et al.*, 2022). Accountants must critically evaluate technological insights and policies to navigate these challenges effectively (Moll and Yigitbasioglu, 2019). Traditional career paths in management accounting are evolving, driven by digital transformation and global trends. Management accountants are exploring diverse career trajectories beyond traditional roles, driven by factors such as industry changes, firm size and mentorship (Thaller *et al.*, 2024).

Regarding the impact on the organisational level, digital transformation is reshaping management accounting practices, ushering in both opportunities and challenges. Controllers are not only called to develop and adapt new key performance indicators (KPIs), but also flexible steering approaches and new portfolio techniques, mixing traditional with digital business models (Möller *et al.*, 2020). One key area of transformation lies in integrating financial and non-financial data from internal and external sources using advanced analytical tools (Pedroso and Gomes, 2023). This integration enables organisations to enhance their decision-making capabilities by leveraging a comprehensive dataset for performance analysis and strategic planning. Integrated budgeting systems, for example, enhance adaptability by improving resource allocation and coordinating divisional activities, fostering effective enterprise analysis (Bradul *et al.*, 2020). However, digitalisation also brings challenges: notably, the potential exclusion of certain actors from the data-making process. This exclusionary aspect risks decisions being made without the benefit of comprehensive data discussions, thereby disconnecting knowledge from the local organisational context (Ruggeri *et al.*, 2023).

Digitalisation prompts a re-evaluation of the traditional management accounting function within organisations. There is a noticeable shift towards proactive business support and strategic thinking among management accountants, necessitating the acquisition of updated skill sets and competencies (Fähndrich, 2023). This shift is accompanied by the decentralisation of decision-making processes within organisations, wherein management accountants are empowered to play a more active role in strategic decision-making. Furthermore, digitalisation fosters the emergence of novel digital infrastructures and hybrid organisational forms through integrative digitalisation and datafication practices. These practices, driven by the voluntary adoption of digital building blocks, lay the foundation for revolutionary organisational structure and process changes (Begkos *et al.*, 2023). The resulting hybrid organisational forms feature more horizontal connections and collaborative frameworks, enabling organisations to adapt to dynamic market conditions and technological advancements more effectively.

However, organisations must proactively address the challenges related to automation, data governance and the ethical use of technology. Overreliance on digital tools may pose risks, including the potential undermining of the role of management accountants and the legitimacy of automated decision-making processes (Korhonen *et al.*, 2021). Therefore, organisations must adopt a nuanced approach to digitalisation, ensuring ongoing support for digital initiatives while addressing concerns about data governance, privacy and accountability.

Some of the reviewed literature focuses on the societal level, concluding that digitalisation in management accounting can promote societal accountability by enhancing transparency and trust in governments through improved data sharing and reduced paperwork (Agostino *et al.*, 2022), citizen involvement and collaboration across sectors (Chohan, 2023; Begkos *et al.*, 2023).

3.2 Macro-cluster 2 – auditing

The second macro-cluster explores how auditing and the auditing profession is undergoing a profound transformation driven by digital technologies, including data analytics, AI, blockchain, mobile applications, workflow automation and collaborative platforms (Fotoh and Lorentzon, 2021). These advancements are intended to streamline processes, reduce manual labour and enhance audit quality by providing predictive and intelligent audit capabilities. Fotoh and Lorentzon (2021) defined audit digitalisation as the incorporation of digital technologies in the audit process to enable audit firms to change their business models, thus creating new revenue sources and value-enhancing opportunities. Separate research has also been developed to investigate the relationship between technology and internal auditing (Pizzi *et al.*, 2021) and public sector audit practices (Busanelli de Aquino *et al.*, 2022; Grossi *et al.*, 2023).

While digitalisation promises efficiency and greater accuracy, it simultaneously introduces a range of unintended consequences manifested across individual, organisational and societal levels. At the individual level, the digital transformation affects auditors' professional identity, ethical standards and skill requirements; at the organisational level, it influences audit quality, governance and culture; and, at the societal level, it impacts regulatory frameworks, public trust and equity within the profession. Most of the papers concern the impacts of digitalisation at the organisational level, although some discuss issues at the individual and societal levels.

At the individual level, digitalisation has significant implications for auditors' roles and the skills auditors are expected to possess. With the increasing reliance on advanced audit tools, auditors are required to be proficient in digital technologies, including data management, data analytics and even coding skills (Kokina *et al.*, 2021). Tiron-Tudor and Deliu (2022) explored how AI disrupts traditional auditing, explicitly focusing on cooperation between human algorithms and its implication for the auditing profession. The researchers found that embracing AI development in auditing creates new positions and roles, instead of replacing auditors. The responsible implementation of AI in auditing still requires a "human-in-the-loop" approach, reflexivity and the assurance that the algorithm output meets the requirements of the audit firm.

At the organisational level, the adoption of digital technologies has reshaped audit processes and organisational structures within audit firms, yet these changes have introduced several operational challenges. Going-concern audits will be digitalised through digital tools such as data analytics, data mining, and cloud and cognitive technologies, resulting in more value-relevant audits for customers and possible improvement of the efficiency of audit-related tasks (Manita *et al.*, 2020). Digital technology will also likely enhance more frequent or real-time audits (Lamboglia *et al.*, 2020). The research in this domain focuses on the technology available to conduct real-time audits (Singh *et al.*, 2014), continuous fraud detection (Nonnenmacher and Gómez, 2021) and management control (Matthies, 2020).

Fotoh and Lorentzon (2021) argue that a "regulatory lag" has emerged, where audit firms adopt digital practices faster than regulations evolve. The researchers argue that the current

auditing standards have been designed for a low-information environment, and there is a growing need to address circumstances in which complete data analysis may become a norm (Manita *et al.*, 2020; Fotoh and Lorentzon, 2021). For example, real-time auditing facilitated by continuous data analytics may raise concerns regarding data security and audit independence, as existing standards lack clear guidelines on managing these technologies responsibly. Furthermore, digitalisation has redefined the boundaries within the auditing profession, particularly with the growing involvement of IT specialists and data analysts in the audit process. As digital tools become more integral to audits, collaboration between financial and IT auditors has become essential, reconfiguring professional roles and responsibilities (Köktener and Tunçalp, 2021). While this integration promotes knowledge sharing, it generates role ambiguity and may lead to conflicts over jurisdiction and authority within audit engagements. For instance, financial auditors may feel their expertise is overshadowed by IT auditors, leading to tensions over decision-making and responsibility for audit outcomes. This shift in professional boundaries necessitates careful management to ensure that interdisciplinary collaboration improves audit quality rather than disrupting workflow and accountability.

At a societal level, the digitalisation of auditing raises broader issues concerning the legitimacy, privacy and ethical dimensions of the profession. De Santis and D'Onza (2021) investigated the use of big data and data analytics as innovative audit methodologies based on Italian data and concluded that such applications are only used to a limited extent in financial auditing because of a perceived lack of internal and external legitimacy. However, the audit profession is undertaking actions to diffuse and institutionalise such techniques in search of greater legitimacy. Nevertheless, external legitimisation through the development of specific standards is still to be achieved. The research also shows that the client's digital maturity level influences the possibility of using data analytics in the audit process. In addition, Tiron-Tudor and Deliu (2022) have stated that ethical implications surface when integrating AI into auditing, particularly regarding issues of accountability and bias. Tiron-Tudor and Deliu (2022) highlighted that AI systems, while powerful, are susceptible to biases based on the data they are trained on, potentially leading to discriminatory practices or unjust outcomes. Auditors relying heavily on AI-generated insights without sufficient oversight may inadvertently endorse biased conclusions, raising ethical questions about fairness and transparency in the audit process. This interplay between human judgment and machine intelligence is essential to prevent ethical lapses, yet it remains a challenging area for the profession to navigate responsibly.

Some of the reviewed papers discuss how digitalisation influences public sector auditing at the individual, organisational and societal levels. While it enhances efficiency, transparency and accountability, digitalisation also presents challenges related to skills, resistance and societal inequalities (Grossi *et al.*, 2023). Addressing these challenges requires a balanced approach that considers the technological and human dimensions of digital transformation.

In the public sector auditing profession, significant transformations are coming due to the adoption of advanced technologies such as audit automation, RPA and big data analytics. These technologies enable auditors to collect, analyse and interpret audit evidence from expanded data sources, including social media and environmental monitoring, thereby increasing the accuracy and efficiency of audits (Otia and Bracci, 2022). Using drones for inventory inspection and carrying out real-time continuous auditing allow auditors to audit entire populations rather than samples, thereby reducing errors and supporting broader societal goals such as sustainability and transparency (Otia and Bracci, 2022).

Despite the advancements it provides, the digital transformation of auditing presents challenges, including the need for new skills, complex data-gathering procedures and the potential for resistance from traditional auditors (Lino *et al.*, 2022). Digital competencies are increasingly crucial for auditors, who must adapt to new roles resembling data scientists and develop skills in big data analytics and other advanced technologies (Otia and Bracci, 2022).

However, digital divides and data quality issues can impede the effective implementation of digital auditing practices, particularly in decentralised systems (Otia and Bracci, 2022).

3.3 Macro-cluster 3 – accountability
Macro-cluster 3 spans topics such as the adoption of digital tools and workforce adaptation to new technologies; the systemic effects of digitalisation on governance and societal equity; digital innovations and sustainability; and digital trust and cybersecurity.

The reviewed literature focusing on the adoption of digital tools and workforce adaptation to new technologies reveals key findings at the individual, organisational and societal levels. At the individual level, challenges such as digital fatigue, cognitive overload and adaptability challenges emerge as unintended consequences. Frequent exposure to new technologies may lead to cognitive overload or stress. Furthermore, the over-reliance on automation and digital tools risks diminishing traditional problem-solving and manual skills, raising concerns about long-term adaptability. These findings underscore the need for balanced approaches that foster digital proficiency and holistic skill development to ensure individuals can thrive in digitally transformed environments.

At the organisational level, the reviewed research highlights the organisational challenges and opportunities of digital transformation, particularly in workforce adaptation, technology integration and leadership dynamics. A key insight is the critical role of top management support and trust in facilitating the adoption of digital tools in organisations. AbuAkel and Ibrahim (2023) showed that trust acts as a mediating factor, increasing the effectiveness of IT infrastructure and perceived benefits in driving the adoption of e-filing systems within organisations. There is also a potential for digital tools to enhance professional and technical competencies when adequately integrated into organisational training and workflows. Sidorova *et al.* (2024) illustrated how simulations using Anaplan help bridge the gap between theoretical knowledge and practical skills, demonstrating the value of experiential learning environments.

However, the reviewed research also highlights challenges, such as fragmented or incomplete integration of digital tools, which can hinder organisational efficiency and create gaps in skill development. Banasik and Jubb (2021) identified a disconnect between academic curricula and industry needs, particularly in developing teamwork and digital literacy skills, which suggests that organisations must collaborate more closely with educational institutions to align training with workforce demands. The research also points to unintended disparities in skill distribution within organisations. Suarta *et al.* (2024) revealed that digital transformation can disproportionately benefit tech-savvy employees while marginalising those less proficient, creating a polarised workforce. Ethical and privacy concerns also emerge as critical themes, particularly in the use of social media and other digital platforms for organisational purposes. While digital transformation offers significant opportunities for organisational growth and efficiency, it also requires strategic planning and inclusive policies to mitigate unintended consequences and ensure ethical use and equality.

At the societal level, the reviewed research emphasises that systemic and societal benefits of digital transformation only materialise when adequate infrastructure, trust and supportive governance frameworks are in place. The digital divide creates disparities in access to technology and its benefits across regions and populations. Deineko *et al.* (2022) and Frățilă *et al.* (2023) illustrated how the unequal distribution of digital infrastructure and literacy limits the positive impact of digital transformation in countries such as Ukraine and Romania. These divides often mirror broader socio-economic inequalities, necessitating targeted investments and policies to ensure inclusive growth. The reviewed research also highlights that efforts to bridge this divide must go beyond infrastructure to address digital literacy and economic access barriers.

Part of the reviewed literature specifically focuses on digitalisation and public sector governance and provides important insights at the societal level. The role of e-government

systems in enhancing governance and reducing corruption is a central insight. Castro and Lopes (2023) have demonstrated that digitalisation improves transparency and accountability by limiting discretionary power in public administration. Digitalisation in the public sector includes the adoption of digital governance strategies that increase transparency, efficiency and citizen engagement. These strategies involve cross-sector collaboration and aim to balance openness with efficiency and equity (Grossi and Argento, 2022). Digital governance initiatives are crucial in promoting accountability by automating government services, reducing corruption and enhancing public service delivery (Grossi and Argento, 2022). These initiatives leverage ICT to improve interactions between citizens and governments, thereby fostering democratic governance and citizen engagement (Grossi et al., 2023). Social media and digital platforms provide new avenues for informal and dialogic accountability, allowing citizens to engage more actively with public institutions and hold accountable (Alexander et al., 2023). These platforms enable NGOs and public sector entities to communicate their missions effectively, solicit feedback and raise funds, thus improving transparency and accountability (Kingston et al., 2023).

Integrating AI and other digital technologies into decision-making is intended to increase neutrality and accuracy, although it raises concerns about preserving public values and ensuring democratic principles (Carlsson and Rönnblom, 2022). While ethical guidelines emphasise transparency and accountability, the implementation of such guidelines can lag, potentially limiting citizen influence over technological changes (Carlsson and Rönnblom, 2022). Digital divides and inequalities persist, with marginalised groups often having limited access to digital services and platforms. This can exacerbate social inequalities and create challenges for inclusive digital governance (Adhikari et al., 2023; Cordery et al., 2023).

Public trust and privacy concerns also emerge as significant challenges. Polzer and Goncharenko (2022) showed how scepticism about government transparency and fears of data misuse undermined the adoption of the UK COVID-19 contact-tracing app. These findings underline the importance of fostering trust through clear communication, robust data protection measures and participatory approaches to technology implementation. Furthermore, the emphasis on digital accountability can sometimes cause service recipients to be viewed as mere financial metrics, reducing the qualitative aspects of service performance and prioritising hierarchical accountability over participatory approaches (Rana and Cordery, 2024). Finally, the digital divide and limited access to technology among marginalised groups can exacerbate social inequalities and hinder inclusive accountability practices (Adhikari et al., 2023; Cordery et al., 2023). Finding a balance between digitally generated data and human understanding presents challenges, including defining roles, providing training, ensuring transparency and addressing ethical concerns (Agostino et al., 2022).

Some of the reviewed research explores digital innovations and sustainability, studying how emerging technologies such as blockchain and intelligent automation are applied to drive sustainable practices across various sectors. Two main topics were identified – namely, sustainability in digital and circular economy systems, and blockchain-enabled sustainability – which emphasise the importance of innovative, systems-based thinking in harnessing the full potential of digital technologies for sustainable development.

The papers dealing with sustainability in digital and circular economy systems explore the integration of sustainability concepts into digital and circular economy structures. Several papers examine this integration from a societal-level perspective, considering the broader societal and policy implications underpinning it. The discussion progresses to the role of digital accountability in fostering sustainability through strategic governance (Esposito et al., 2023). Complementing this work, Jørgensen et al. (2023) investigated the role of resource accounting tools and practices in driving the transition to a circular economy. Shifting to an organisational-level analysis, several studies investigate the practical implementation of these concepts. For instance, the reviewed literature identifies critical success factors for effectively implementing blockchain approaches within a circular economy context (Kayikci et al., 2022).

Concerning the topic of blockchain-enabled sustainability, several articles discuss the potential of blockchain technology to transform processes in order to achieve sustainability goals. At the organisational level, Kayikci *et al.* (2022) investigated the organisational implementation of blockchain in circular economies. Silva *et al.* (2022) bridged organisational and societal levels by examining practical organisational issues in blockchain-enabled auditing transparency, while considering broader accountability implications. Blockchain technology can be pivotal in promoting sustainability in various fields. The reviewed discussions emphasise the importance of strategic innovation, combined with robust systems thinking, to achieve the full benefits of digital technologies for sustainable development. Integrating blockchain with sustainability initiatives is examined as a route to increase operational efficiency; it also brings benefits in transparency and accountability, which are potentially important in advancing global sustainability agendas.

Some of the reviewed papers encompass a variety of perspectives on how digital technologies are transforming traditional processes and practices across sectors. Emergent research streams relating to digital transformation in corporate reporting, with a focus on the roles digital technology plays in practical business matters such as enhancing earnings management, information management, decision-making and stakeholder engagement, as well as more universal issues such as sustainability practices and corporate social responsibility – all with an eye on accountability and transparency (Lombardi and Secundo, 2020). Taking an organisational-level perspective, the role played by digital transformation in facilitating innovation in sustainable business models is analysed, suggesting that digital tools and platforms can significantly increase scalability and efficiency in organisations' sustainability practices (Izzo *et al.*, 2022). At the societal-level, a Special Issue examines the impact that digital innovation in the tourism sector is having on the Sustainable Development Goals (SDGs), looking at issues such as digital detox opportunities, the promotion of tourism in social media through "foodstagramming", educational simulations and virtual reality tours, alongside the role of regulation in ensuring accountability and transparency (Gössling, 2020).

Finally, some reviewed studies focus on the challenges of data breaches and cybersecurity, and discuss data protection strategies in the digital age. At an organisational level, the urgent need for robust security measures to protect sensitive financial information is highlighted (Haapamäki and Sihvonen, 2019). In a societal-level analysis, the implications of surveillance capitalism and data breaches are critically examined, with a discussion of the range of regulations that govern their disclosure and how the disclosure of data breaches continues to rely significantly on the discretion of individual organisations (Andrew *et al.*, 2023). These papers exemplify the varied intersections of digital transformation and cybersecurity with broader societal and economic issues and how these shape the future technology and security landscape.

3.4 Summary of the findings from the reviewed literature

The findings of the analysis of the reviewed literature show how digital transformation, involving the adoption of – and adaptation to – advanced technologies such as AI, blockchain, robotic process automation and digital platforms, has introduced significant opportunities for increasing efficiency, transparency and stakeholder engagement, while simultaneously carrying significant challenges such as skill gaps, ethical dilemmas and social inequalities. Addressing these issues requires a holistic approach that incorporates inclusive policies, continuous skill development and robust ethical frameworks to harness the full potential of digital transformation. Table 3 summarises the findings from the reviewed literature.

As shown in Table 3, digital transformation has redefined roles and professional identities in accounting and auditing at the individual level. For accountants, traditional tasks such as bookkeeping have been increasingly automated, enabling professionals to transition into more strategic roles. Technologies such as RPA and AI automate repetitive processes, freeing

Table 3. Summary of findings from the analysed literature

Level/concept	Individual level (Reactions from individuals)	Organisational level (How organisations as systems react)	Societal level (How society is influenced by and influences the process of digitalisation)
Accounting	Digitalisation introduces tools such as RPA, AI and blockchain that automate routine accounting tasks, enabling accountants to shift towards strategic advisory roles. New skills such as data analytics and digital literacy are increasingly critical, requiring continuous learning and adaptation. Educational challenges and ethical dilemmas related to data privacy and AI bias	Organisations integrate financial and non-financial data using digital platforms to enhance decision-making and efficiency. Technologies like blockchain and cloud computing reshape accounting workflows, enabling real-time and transparent financial management. However, disparities in digital readiness within organisations lead to uneven skill distribution and resistance to transformation	Digitalisation promotes transparency in public sector accounting through tools that enhance governance and service delivery. Socio-economic divides in digital literacy and access hinder equitable benefits of accounting innovations
Auditing	Auditors must develop proficiency in technologies such as data analytics, AI and blockchain to interpret and oversee advanced audit systems. Digital tools demand new ethical frameworks and professional skepticism to maintain integrity amidst machine-driven processes. Role redefinitions include hybrid collaborations with IT specialists, requiring auditors to adapt to new interdisciplinary demands	Digital technologies revolutionise audit processes with continuous auditing, real-time fraud detection and enhanced data analysis capabilities. Challenges include regulatory lags, ethical concerns and potential over-reliance on automation. Collaborative frameworks emerge as auditors increasingly work with IT specialists and data scientists, introducing governance and role conflicts	Digitalisation influences public trust and regulatory frameworks, driving efforts towards greater audit transparency and sustainability. Ethical concerns related to AI and data privacy pose risks to public perceptions of fairness in audits
Accountability	Digital fatigue and adaptability challenges Professionals face increasing pressure to ensure real-time data transparency and reporting. Ethical considerations emerge, as digital tools may prioritise efficiency over nuanced professional judgement	Digital accountability mechanisms leverage blockchain and automated systems for transparency, efficiency and fraud prevention. Organisations face pressure to balance hierarchical accountability with participatory approaches to maintain inclusivity and trust.	Digital technologies facilitate data sharing and participatory governance. They contribute to sustainable development. Persistent digital divides and concerns over data misuse and breaches challenge efforts to democratise accountability.

Source(s): Table created by authors

accountants to focus on data analysis, advisory functions and value-adding activities. This shift necessitates the development of new skills, particularly in data analytics, cloud computing and digital reporting tools (Kokina and Blanchette, 2019; Richardson *et al.*, 2018).

Similarly, auditors must adapt to advanced tools that support real-time auditing and fraud detection, such as data analytics and blockchain, which demand a hybrid skill set that combines technical and traditional auditing competencies (Manita *et al.*, 2020; Tiron-Tudor and Deliu, 2022). Yet, digital transformation poses ethical challenges, such as managing biases in AI-driven audits and ensuring data privacy and security (Zhang *et al.*, 2023). Professionals often grapple with ethical dilemmas while balancing the benefits of digital tools with their limitations, such as over-reliance on algorithms and reduced manual problem-solving capabilities (Wilkin, 2022). Regarding accountability, digital fatigue and adaptability challenges are recognized.

At the organisational level, digital technologies have restructured accounting and auditing practices, driving greater efficiency and transparency. In accounting, blockchain and cloud-based systems have enabled organisations to consolidate financial and non-financial data into unified hubs, enhancing decision-making and enabling real-time financial reporting (Bradul *et al.*, 2020; Pflueger *et al.*, 2022). Such transformations allow firms to achieve operational agility and better resource allocation. However, these changes also bring challenges, such as resistance to adopting new systems and employee skill disparities (Banasik and Jubb, 2021; Suarta *et al.*, 2024). Digital auditing tools have revolutionised organisational practices by facilitating continuous audits and fraud detection through automated systems (Lamboglia *et al.*, 2020). Despite these advancements, challenges persist, including regulatory lags and ethical concerns about auditor independence and data governance (Fotoh and Lorentzon, 2021). In addition, interdisciplinary collaboration has become essential, as financial auditors increasingly work alongside IT specialists and data scientists to integrate advanced technologies into audit processes. While such collaboration enhances capabilities, it also introduces role ambiguity and potential conflicts (Köktener and Tunçalp, 2021).

Accountability at the organisational level has also evolved with digital transformation. Blockchain and intelligent automation increase accountability by ensuring transparent, tamper-resistant records and improving stakeholder engagement. These digital tools can foster participatory governance and reduce corruption, particularly in public sector accounting (Grossi and Argento, 2022; Castro and Lopes, 2023). However, the emphasis on digital data and hierarchical accountability often marginalises participatory approaches, highlighting the need for balanced strategies that consider inclusivity and trust (Rana and Cordery, 2024).

At the societal level, digital transformation has broad implications for accounting, auditing and accountability, particularly in promoting transparency and trust. Public sector accounting has embraced digital governance strategies to improve service delivery and reduce corruption through automated processes (Grossi and Argento, 2022). Digital platforms enable citizens to engage more actively with government institutions, fostering democratic accountability and reducing hierarchical power imbalances (Alexander *et al.*, 2023). However, these benefits are not evenly distributed, due to persistent digital divides. Limited access to technology and disparities in digital literacy exacerbate socio-economic inequalities, undermining the equitable impact of digital transformation (Deineko *et al.*, 2022; Frăţilă *et al.*, 2023). In auditing, digital tools increases public trust by improving audit transparency and expanding the scope of assessments to include broader goals such as sustainability and environmental impacts (Otia and Bracci, 2022). However, ethical concerns related to data privacy and the legitimacy of AI-driven audits challenge the public's trust in the profession (De Santis and D'Onza, 2021). Similarly, accountability mechanisms in the digital era, while increasing transparency and facilitating participatory governance and sustainable development, must address the unintended consequences of surveillance capitalism and data breaches, which risk compromising individual privacy and societal trust (Andrew *et al.*, 2023).

4. The articles included in the AAA special issue
The nine articles included in this AAAJ Special Issue use different theories and research methods to explore how digital technologies impact different levels of analyses (individual,

organisational and societal) and have different implications for accounting and accountability, as summarised in Table 4.

The article by Carlsson-Wall *et al.* (2024) explores the link between accounting and promises in the context of digital change in the public sector. Based on the growing literature on accounting and promises, the authors conducted a qualitative field study covering 57 interviews with municipal directors, digitalisation strategists, public managers and CFOs in a Swedish region with 13 municipalities. The paper provides diverging insights into how municipalities draw on accounting in attempts to reconstruct or transform promissory narratives of digital transformation. The authors apply the promise theoretical lens to the literature on accounting and digital change and empirically explore how accounting is implicated in shaping promises in the context of public sector digital change.

Dinh and O'Leary's (2024) article explores the evolving dynamics of participatory accountability within humanitarian contexts, where digitally connected crisis-affected populations demand better accountability from aid organisations and, as a result, shift traditional hierarchies and relationships between humanitarian agencies and beneficiaries.

Table 4. Outline of the articles in the AAAJ Special Issue

Authors	Issues	Level of analysis	Theory	Research method/context
Carlsson-Wall, Laurell, Lindqvist Parbratt and Ots	Accounting	Organisation	Promissory narratives	Interviews/Swedish municipalities
Dinh and O'Leary	Accountability	Organisation	Networks of mediation (Chouliaraki and Georgiou)	Social media platforms/ International Committee of the Red Cross (ICRC)
Fortin, Pimentel and Boulianne	Accountability	Organisation	Blockchain Accountability	Interviews/early blockchain adopters
Kastrup, Grant and Nilsson	Accounting	Organisation	'The Logic of Judgments of Practise and *Logic: The Theory of Inquiry* (Dewey)	Semi-structured interviews, observations and other meetings from a field study at a Big Four accounting firm in Sweden
Massaro, Spanó and Kuruppu	Accountability	Society	Critical dialogic accountability	Interviews, direct observation and reports/ metaverse
Neu and Saxton	Accountability	Society	Dialogic social accountability	Latent Dirichlet allocation topic modelling approach as well as XGBoost machine learning algorithms/ The #OccupyWallStreet conversation stream on Twitter
Papenfuß and Wagner-Krechlok	Accounting	Organisation and individual	Agency theory	Online survey interviews and content analysis
Tiron-Tudor, Rodgers and Deliu	Accounting	Individual	Anthropocentric perspective	Reflexive thematic analysis/ professional accountants
Yusuff, Whittle and Mueller	Accountability	Organisation	Critical dialogical accountability	Discourse analysis/Big Tech industry
Source(s): Table created by authors				

The study analyses internal organisational challenges and explores the implications of digital platforms on humanitarian practices. The authors use Chouliaraki and Georgiou's networks of mediation – particularly "intermediation" and "transmediation" – to understand how digital expressions translate to offline contexts and reshape meanings and actions. The study reveals that social media platforms enable beneficiaries to demand participatory accountability beyond traditional practices, thus democratising humanitarian response and challenging power structures. This article contributes to the literature by highlighting the impact of digital technology – particularly social media – on participatory accountability. It extends the understanding of the evolving accountability landscape within the humanitarian sector and offers new insights into the complexities and dual purposes of participatory accountability in contexts of resistance.

The article by Fortin *et al.* (2023) explores how introducing a permissioned blockchain in a supply-chain context impacts accountability relationships and the process of rendering an account. The authors examine how implementing a digital transformation affects the governance of network transactions. The authors conducted 28 interviews and focused on firms that were early blockchain adopters to gain insight into how implementing a permissioned blockchain can transform information sharing, coordination and collaboration between business partners, which have now been converted into network participants. The authors contribute to the literature on accountability in the blockchain by exploring how accountability relationships are enacted and accounts are rendered in a permissioned blockchain context. In addition, the authors complement existing work on accountability and governance by proposing an integrated model across three dimensions: ledger, code and people.

The article by Kastrup *et al.* (2024) aims to investigate how the incorporation of more data and new data analytics (DA) tools affects the role and use of judgment in financial due diligence. The paper reports findings based on semi-structured interviews, observations and other meetings from a field study at a Big Four accounting firm in Sweden. Using Dewey's *The Logic of Judgments of Practise* and *Logic: The Theory of Inquiry,* the article distinguishes between theoretical (i.e. what is probably true) and practical judgment (i.e. what to do). The article foregrounds the pragmatic dimension of knowledge production for decision-making and contributes to a better understanding of the role, use and importance of accounting professionals' judgment in a data-driven world.

Massaro *et al.*'s (2023) article aims to understand the main challenges connected with accountability issues across multiple metaverse layers, identify whether and how any "techwashing" is taking place and discuss implications for accounting research. The authors refer to a critical dialogic accountability framework operationalised in the current paper by leveraging the perspectives of accountability as virtues and as mechanisms. The authors discuss who is accountable to whom, for what and in what manner in a relatively unregulated and unaccountable world through the layers of virtual reality. The findings show how metaverse creators deal with accountability as a virtue and mechanism. The paper advances the idea that the current creators of metaverses are techwashing their projects by providing a utopian ideal of what their universes will look like but obfuscating the realities of their ventures in tech jargon that few people are likely to understand. This paper is one of the first to address the issue of accountability in metaverses and to guide future accounting and accountability research into virtual worlds.

Neu and Saxton's (2023) article is motivated to provide a theoretically informed, data-driven assessment of the consequences associated with the participation of non-human bots in social accountability movements – specifically, the anti-inequality/anti-corporate #OccupyWallStreet conversation stream on Twitter. A latent Dirichlet Allocation (LDA) topic modelling approach, as well as XGBoost machine learning algorithms, are applied to a dataset of 9.2 million #OccupyWallStreet tweets to analyse not only how the speech patterns of bots differ from those of other participants but also how bot participation influences the trajectory of the aggregate social accountability conversation stream. The findings help

improve understanding of the consequences of bot participation within social-media-based democratic dialogic processes. The analyses also raise important questions about the increasing importance of apparently nonhuman actors within different spheres of social life. This paper is one of the first to use a theoretically informed big-data approach to simultaneously consider the micro details and aggregate consequences of bot participation within social-media-based dialogic social accountability processes.

The article by Papenfuß and Wagner-Krechlok (2025) deals with the unaccounted effects of digital technologies (as integrated information systems) on accountability, focusing on the use of social, ecological and economic performance information on state-owned enterprises (SOEs) to assess by politicians and public administrators of German cities and the extent to which public corporate governance codes can be useful to balance these effects. In particular, the authors explore how performance information on SOEs was used by city politicians and managers in the preparation of city budgets, financial statements and accounting reports. The study shows that digital technologies are associated with a greater use of economic but not social performance information, indicating an unaccounted effect of digital transformation.

Tiron-Tudor et al.'s (2024) article titled "The Accounting Profession in the Twilight Zone" explores the challenges of the accounting profession in an advanced digitalised future, where humans and robots will collaborate in working teams. The authors conducted a reflexive thematic analysis to identify the challenges and associated socio-ethical risks of digitalisation and propose an ethical decision-making model to address these sided challenges. Taking an anthropocentric perspective, the article explores the difficulties of the accounting profession's accelerated digitalisation, which contributes to fostering accountability and legitimacy, and thus serves the public interest. The article also contributes possible solutions to digitalisation's challenges that might interfere with practitioners' professional judgement independence and identity.

The purpose of the article by Yusuff et al. (2023) is to explore "big tech" in the context of increasing societal concerns about the harms associated with these companies' products, services and business practices. The study uses the critical dialogical accountability literature to identify two areas of contestation during periods of change in accountability systems. The authors analyse four US congressional hearings in which the CEO of Facebook was held to account for the company's alleged breaches and harms, and conduct a discourse analysis of the dialogue between the account giver (Mark Zuckerberg) and account holders (Members of Congress) in the oral testimony at the four hearings. This study advances critical dialogical accountability theory by conceptualising the process of accountability system change as underpinned by discursive contests, in which multiple actors socially construct the "problem" with existing accountability systems and engage in struggles over the proposed "remedy" for this problem. The outcomes of these discursive contests are significant because they inform the development of reforms to the accountability system in industries undergoing periods of scandal or crisis.

To conclude, the nine articles in the AAAJ Special Issue on the unaccounted effects of digital transformations report diverging implications for the accounting and accountability fields and unintended impacts on individuals, organisations and society. Carlsson-Wall et al.'s (2024) article adds empirical knowledge about civil servants' struggles with accounting for digital promises in the public sector. Kastrup et al.'s (2024) article shows that financial due diligence, despite the increase in digital technologies, remains a convenient endeavour in which practical and theoretical judgments are exceedingly important. The article by Tiron-Tudor et al. (2024) reveals that key challenges for professional accountants in the digital age involve autonomy, privacy, balance of power, security, human dignity, non-maleficence and justice, each including multifaceted dimensions that are dynamically interconnected with digital technologies.

Dinh and O'Leary's (2024) article offers a critical analysis of the perceived use of digital technology as a tool of participatory accountability that enhances democratisation and inclusiveness, along with the simultaneous perception that, under its use for purposes of

accountability, digital technology creates new layers of vulnerability in its users. In particular, their findings show that participatory accountability can have unintended consequences, contradictions and dual purposes when introduced in fraught, precarious and unsettled contexts. Fortin *et al.*'s (2023) article also shows that digital technologies (e.g. blockchain) are often valued for enabling transparency through the visibility of their transactions. Still, the authors argue that this is view is incomplete: transparency alone cannot satisfy the duty of accountability, as it can result in selective disclosure or obfuscation. Neu and Saxton's (2023) article confirms that the emergence of social media has created opportunities, but the emergence of bots, other forms of AI and digital surveillance provides new ways to fragment and weaken social accountability. The article by Yusuff *et al.* (2023) explores the development in reforms to existing accountability systems in the case of "big tech" firms, due to increasing societal and accountability deficits and concerns about the harm associated with their products, services and business practices. In the same vein, the paper by Massaro *et al.* (2023) advances the idea that the current creators of metaverses are "techwashing" their projects by providing a utopian ideal of what their universes will look like but obfuscating the realities of their ventures in tech jargon that few will understand.

5. Conclusions and directions for further research

Despite the growing literature on how digitalisation is transforming accounting, auditing and accountability, there is still a need for a deeper understanding of its advantages and challenges. To address this knowledge gap, this paper aimed to uncover the hidden consequences of digital transformation by exploring the extant academic research in this field and serving as an introduction to the AAAJ Special Issue titled *Accountability for a Connected Society: The Unaccounted Effects of Digital Transformation*. Three specific research questions were addressed. The first question asked, "What prominent trends and topics are explored in the extant literature concerning the unintended consequences of digital transformation for accounting, auditing and accountability?". The second question aimed at deeper insights by asking, "What are the primary focal points at the individual, organisational and societal levels within the key research topics identified in the literature and the articles included in this AAAJ Special Issue?" The third and last question came from a forward-looking stance, asking, "What future research directions and trends concerning the unintended consequences of digital transformation in accounting, auditing and accountability are outlined in the literature and the articles included in this AAAJ Special Issue?"

To address the first two research questions, a systematic literature review was performed, combining bibliometric analyses with a qualitative review, and three macro-clusters were identified. These thematic clusters deal with the impacts of digital transformation on accounting, auditing and accountability. The articles included in those clusters and the nine articles in this AAAJ Special Issue provide insights into the effects of digital transformation at the individual, organisational and societal levels. Although the benefits of digital transformation are identified in the reviewed papers, the challenges of data overload, data security, ethical concerns, preparedness and accessibility issues are equally visible, creating a need for further research. Below, possible future research directions are presented, thereby addressing the third research question.

5.1 Future research on macro-cluster 1 – accounting

At the individual level, the unintended consequences of digital transformation often revolve around individual experiences of the adoption of new technologies. Additional research is needed to examine how the integration of advanced digital tools is reshaping the roles, identities and skill requirements of accounting professionals. As automation and AI assume more of the routine tasks traditionally associated with accounting, professionals are increasingly transitioning into advisory roles that demand strategic thinking and data

analytics skills. Future research could explore how digital transformation inadvertently exacerbates inequalities by creating barriers for individuals with limited access to tools or training, particularly in under-served communities (Wilkin, 2022). Addressing these gaps would provide valuable insights into designing more inclusive digital ecosystems. Another promising direction of further research involves investigating behavioural and skill-based aspects of digital tools. While these technologies can enhance critical thinking and technical competencies, over-reliance on automation may weaken traditional skills or independent problem-solving abilities (Wilkin, 2022). Research could also focus on technology-induced stress, in order to identify strategies for balancing innovation with psychological wellbeing.

More studies are needed to better understand how these changes influence professional identity, comparing variations across regions and sectors to uncover factors that affect this evolution. Additionally, the ongoing demand for digital skills underscores the importance of continuous professional development. Future research could explore frameworks for lifelong learning, such as micro-credentialing and tech-enhanced learning platforms, which enable professionals to stay current with technological advancements. Another critical focus could be on curricular reforms in accounting education. To align with industry demands, future research might assess the effectiveness of embedding digital tools, data analytics and interdisciplinary projects in accounting curricula, thus ensuring that graduates are prepared for a tech-driven profession from the outset. Collectively, these directions offer a comprehensive view of the shifts occurring at the individual level, helping educational institutions and professional bodies tailor training to meet evolving needs.

At the organisational level, digital transformation demands significant adjustments to culture, leadership and business practices within accounting firms. Here scholars are called to investigate how the adoption of digital tools impacts organisational culture, leadership styles and team dynamics, shedding light on how firms can effectively manage the structural changes required to support digital adoption. Leadership in particular plays a crucial role in managing these transformations, with forward-thinking leaders being needed in order to foster a culture of innovation and adaptability. Another area of interest is the integration of emerging technologies such as quantum computing, blockchain and advanced AI, which hold the potential to automate complex auditing processes and provide predictive insights for financial management. Cross-industry studies could further inform best practices, comparing digital transformation strategies in accounting with those in other sectors to identify transferable insights. Longitudinal studies could be valuable as well, by providing a long-term perspective on the impacts of digital transformation on firm performance, employee satisfaction and client outcomes. Finally, recognising the diverse challenges faced by organisations across regions, future research could examine how regulatory flexibility, economic conditions and regional priorities shape the pace and nature of digital adoption in accounting, thus offering global firms a nuanced understanding of local adaptations.

From a societal perspective, the ethical and regulatory implications of digital transformation in accounting present important areas for research. The rapid adoption of AI, RPA and other digital tools has raised concerns around data privacy, security and ethical conduct, prompting a need for frameworks that ensure transparency and uphold public trust in financial reporting. Research could investigate best practices for balancing the efficiency and accuracy gains from digital adoption with the ethical responsibilities of accountants. Beyond the private sector, there is a need to consider how public and non-profit organisations can keep pace with digital advancements. Digital innovations (e.g. ERP systems) could also be drivers of accounting reforms in the public sector (Bekiaris and Markogiannopoulou, 2023). Public sector entities, which are often under resource constraints, may struggle to implement and sustain digital initiatives, making it essential to examine targeted support programmes, such as training subsidies or collaborative partnerships, that can enhance their digital capabilities. Regional differences also play a pivotal role in the societal impacts of digital transformation. Examining how geographic and economic factors influence digital adoption at a broader scale could aid in crafting policies that promote equitable digital integration across regions.

Longitudinal studies could also provide insights into the broader societal impacts of digital transformation on job markets, productivity and regulatory landscapes, helping policymakers anticipate and address potential challenges.

Research into digitalisation in management accounting at the individual level should investigate the evolving skill requirements for management accountants and the role of hybrid professional identities in fostering collaboration. At the organisational level, future studies could focus on how integrating financial and non-financial data impacts decision-making processes and accountability within organisations by focusing on how organisational functions are (re)organised due to digital advancements. At the societal level, the implications of using digital tools in public sector management, particularly in enhancing transparency and citizen engagement, merit further exploration. Furthermore, understanding how decentralised decision-making models driven by digital technologies affect organisational structures and governance could yield actionable insights.

5.2 Future research on macro-cluster 2 – auditing
The digital transformation in auditing is introducing profound changes with both intended and unintended consequences that impact the auditing profession at the individual, organisational and societal levels. While digital tools offer increased efficiency and precision, they also create new complexities that require careful examination. At the individual level, the integration of AI, machine learning and data analytics into auditing challenges auditors' professional identity, ethical standards and required skill sets. As auditors increasingly work alongside algorithms, their roles are shifting from direct examination to the oversight and interpretation of AI outputs. This shift raises questions about how auditors perceive their changing responsibilities and how such changes affect their sense of professional identity. Research could focus on understanding how this role transformation influences auditors' job satisfaction, career development and perceptions of meaningfulness in their work. Moreover, the reliance on digital tools introduces ethical concerns related to biases in AI and the transparency of algorithmic decision-making. Scholars could investigate how auditors maintain professional scepticism and ethical standards when relying on opaque AI systems, thereby examining potential impacts on decision-making and judgment. Lastly, there is a need to explore the evolving skill requirements for auditors, particularly the balance between technical (e.g. data analytics, AI literacy) and traditional auditing competencies. Future studies could address the impact of these skill changes on training needs, recruitment strategies and career trajectories within the auditing profession.

At the organisational level, digital transformation influences audit firms' structures, governance practices and organisational culture. Continuous auditing, enabled by ERP systems, blockchain and other digital tools, offers opportunities for real-time assessment but presents barriers such as cultural resistance and high implementation costs. Research could examine the unintended consequences of continuous auditing on organisational culture, with a focus on how it affects trust, communication and resistance to change. In addition, digital tools designed to enhance fraud detection bring risks associated with a possible over-reliance on automated systems, potentially undermining critical thinking and professional scepticism among auditors. This area of research could explore how digitalisation affects audit quality, including unintended effects on auditors' ability to identify anomalies and nuanced issues that automated systems might overlook.

At the societal level, digital transformation in auditing has broader implications for regulatory frameworks, public trust and equity across the auditing profession. Future research could examine the unintended consequences of regulatory lag, including potential inconsistencies in audit quality and the risk of over-auditing, where firms continue traditional procedures alongside digital ones to compensate for unclear guidelines. Another societal impact relates to public trust in auditing. Digital transformation can increase transparency but also raises concerns about data privacy, security and the reliability of AI-

driven audits. Research could explore how public perceptions of audit reliability and auditor independence are influenced by the integration of AI and other digital tools, assessing potential impacts on stakeholder trust in financial reporting. Finally, digital transformation may exacerbate differences within the auditing profession, particularly affecting smaller audit firms that lack the resources to implement advanced technologies. Future research could address how smaller audit firms embrace these digitalisation pressures.

Future research in public sector auditing should analyse the impact of mandatory digital transformation on professionals' development, identity and wellbeing. Such studies could be useful for exploring auditors' individual and collective conceptualisation and perception of their identity in the context of digital transformation (Cordery and Hay, 2024; Volodina and Grossi, 2024). Investigating the role of ethics training in preparing public sector auditors for digital accountability challenges would provide actionable insights. New research could examine how digital tools enhance resource optimisation and adaptive governance, focusing on barriers to blockchain adoption. Future studies could also explore the effectiveness of digital accountability in fostering citizen trust and engagement, while addressing the ecological trade-offs associated with large-scale digitalisation.

5.3 Future research on macro-cluster 3 – accountability

At the individual level, future studies could examine the effects of digital fatigue and cognitive overload, particularly in education and professional training, where constant technological adaptation may impact productivity, mental health and learning outcomes (Beukes *et al.*, 2018; Sugahara *et al.*, 2024).

At the organisational level, unintended consequences of digital transformation arise within organisational dynamics, including technology adoption, workforce adaptation and operational efficiency. One critical area for future research involves organisational resistance to digital transformation, which involves the interplay between trust, leadership support and employee engagement. While studies highlight the importance of top management support and a robust IT infrastructure (AbuAkel and Ibrahim, 2023), further research could explore how cultural and organisational inertia impede digital adoption, especially in industries resistant to change. Moreover, it is essential to investigate the impacts of uneven skill distribution within organisations, since digital transformation may disproportionately benefit tech-savvy employees while marginalising others (Banasik and Jubb, 2021; Suarta *et al.*, 2024). Future research could also focus on ethical concerns, including privacy risks and data misuse, as organisations increasingly adopt technologies such as social media and e-filing systems (Polzer and Goncharenko, 2022). Addressing these questions will enable organisations to align digital innovations with ethical practices and workforce development while mitigating unintended disruptions.

At the societal level, unintended consequences of digital transformation manifest in systemic inequalities, governance challenges and societal trust issues. A key area for future research involves the deepening of digital divides, as disparities in access to technology, digital literacy and infrastructure persist, despite efforts to promote inclusivity. Studies such as those by Deineko *et al.* (2022) and Frățilă *et al.* (2023) point out regional inequalities in digitalisation, where under-resourced areas lag behind in benefiting from digital tools. Research should investigate strategies to reduce these divides, with a focus on targeted policies and investments that ensure equitable access to digital resources across geographic and socio-economic lines. Furthermore, research points to limited public trust in digital governance systems, as indicated by the challenges of implementing e-government initiatives and digital public services (Bhuiyan, 2011; Castro and Lopes, 2023). Also, public scepticism and concerns over privacy and insufficient transparency can undermine the adoption of transformative technologies (Polzer and Goncharenko, 2022). Future studies could therefore explore mechanisms for increasing trust, such as through improving transparency, increasing citizen engagement and establishing accountability frameworks in digital

governance. Moreover, research on the unintended ecological costs of digitalisation, such as increased energy consumption and e-waste, could offer valuable insights into creating sustainable digital ecosystems.

Research in the area of digital innovations for a sustainable future has explored the potential of digital innovations for a sustainable future, and several areas have been identified as suitable for future investigation. At the individual level, there is a notable dearth of research, suggesting a need for studies that examine the impact of digital innovations on individual behaviour and decision-making processes associated with sustainability. For instance, future research could explore how intelligent automation affects individual perceptions of corporate social responsibility and sustainability performance. Investigating the role of individual stakeholders in promoting sustainability through digital innovations, such as blockchain-enabled circular economy systems, may also provide insight into the human element of sustainable development.

At the organisational level, future research could focus on examining the critical success factors for implementing blockchain-based circular supply chains and developing decision-making frameworks for blockchain in the circular economy context. Furthermore, investigating the interplay between innovation strategies and digital transformation in various sectors, such as healthcare, could help organisations enhance their resilience in the face of ongoing challenges. From a societal perspective, future research streams could investigate the role of government policy effectiveness in promoting supply-chain resilience through digital transformation. Research could also explore the impact of institutional pressures on the adoption of emerging technologies such as cloud computing. By studying these areas, researchers could provide a comprehensive understanding of the complex interactions among digital innovations, sustainability and societal development, ultimately informing strategies for a more sustainable and connected future.

There are significant unaccounted-for effects that warrant further investigation as we navigate the complexities of digital transformation and its far-reaching consequences. At the individual level, future research could focus on examining the impact of digital transformation on individual employee performance and productivity, as well as exploring the role of blockchain-based systems in enhancing individual investor decision-making processes. Additionally, the influence of social media on individual investor behaviour and corporate governance requires closer examination.

Organisational-level research can help us better understand the effects of cryptocurrency and Initial Coin Offerings (ICOs) on corporate governance and financing, or investigate the efficacy of disclosure practices in mitigating the impacts of data breaches. Furthermore, the integration of digital tools in information management and accountability processes requires further analysis.

From a societal-level perspective, future research could assess the implications of surveillance capitalism and data breaches on societal issues such as climate change and misinformation. By shedding light on these unaccounted-for effects, we can help establish a more accountable and connected society that harnesses the benefits of digital transformation while mitigating its negative consequences.

5.4 Research directions emerging from the articles included in this Special Issue

The organisational-level studies included in this Special Issue reveal several critical avenues for future research on the organisational implications of digital transformation, emphasising the need for balance among technological innovation, ethical considerations and human oversight. A key area of focus is the integration of advanced digital tools such as blockchain within organisations while maintaining robust governance structures. Fortin *et al.* (2023) call for studies exploring how blockchain-based systems can combine technological governance with human oversight to enhance accountability and foster ethical decision-making in complex supply chains. Similarly, Carlsson-Wall *et al.* (2024) recommend research on how accounting systems can manage the promises of digital transformation, particularly in public sector projects, ensuring realistic expectations and preventing misaligned outcomes.

Ethical challenges arising from digitalisation remain a priority for future research. Tiron-Tudor *et al.* (2024) highlight socio-ethical risks such as privacy concerns, algorithmic bias and reduced autonomy in human–AI collaboration. Research is needed to refine ethical decision-making frameworks that can address these risks effectively, with an emphasis on how ethical paradigms such as deontology or relativism shape organisational responses. Additionally, Fortin *et al.* (2023) emphasise the need for research into collaborative accountability frameworks for inter-organisational blockchain systems, with a focus on navigating the complexities in designing fair and equitable mechanisms for diverse stakeholders.

Another critical area is the adaptability and flexibility of accounting systems in meeting diverse organisational goals in digitally transformed environments. Carlsson-Wall *et al.* (2024) stress the importance of flexible tools that accommodate both tangible and intangible outcomes of digitalisation, especially in complex sectors such as healthcare and infrastructure. Finally, future research should address the risks associated with over-reliance on automation, as noted by Tiron-Tudor *et al.* (2024) and Fortin *et al.* (2023). Studies could explore hybrid models that integrate the strengths of human expertise with technological capabilities, thereby ensuring that digital transformation supports ethical, informed and accountable decision-making across organisational contexts.

The societal-level papers collectively emphasise the need to address the systemic accountability challenges posed by digital transformation, with a focus on equity, governance and sustainability. Bridging the digital divide remains critical, as highlighted by Dinh and O'Leary (2024), who stress the importance of extending digital platforms to under-served communities and overcoming barriers to meaningful participation, particularly in crisis contexts. Algorithmic bias and transparency are key areas requiring further exploration. Massaro *et al.* (2023) point out the need for frameworks to ensure fairness and accountability in AI and blockchain technologies, particularly when used in governance and public accountability systems. Neu and Saxton (2023) suggest that future research could investigate how digital platforms can be designed to enhance rather than undermine democratic accountability, ensuring that diverse voices are represented without manipulation.

Data privacy and governance remain pressing concerns. Yusuff *et al.* (2023) emphasise the need for regulatory frameworks that hold tech firms accountable for privacy breaches and misinformation while safeguarding individual rights. At the same time, sustainability challenges – such as e-waste and energy consumption – require integrated accountability measures. Carlsson-Wall *et al.* (2024) call for the development of sustainability metrics and policies to align digital innovation with environmental and societal goals.

There is a need for scholars to consider all the challenges brought by digital transformation at different levels, including the need for data protection and dealing with large amounts of data (societal level), the need to be accountable and transparent when using digital technologies (organisational level), changes in professionals' profiles, and a lack of skills and competence (individual level). More evidence on the use and unaccounted effects of digital technologies and new audit methods, big data, AI, the automation of audit processes, data collection and digital communication techniques will provide valuable insights into the future of inter-disciplinary accounting literature.

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