Rethinking Public Sector Accountability in Digital Transformation: A Critical Integrative Review

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Abstract

Digital transformation is reshaping public sector accountability by expanding the availability, visibility, and circulation of governmental data while reconfiguring relationships among public institutions, citizens, private actors, and digital technologies. This article presents a critical integrative review of literature on digital transformation and public sector accountability. It synthesizes foundational accountability scholarship, prior structured reviews, and recent studies published mainly between 2021 and 2025 to examine how digitalization affects accountability mechanisms in public administration. The review identifies six major themes: transparency and open data, citizen participation and social media, performance measurement and analytics, digital financial management and auditing, AI and algorithmic accountability, and social equity in digital governance. The synthesis shows that digital tools such as open data platforms, social media, performance dashboards, integrated financial systems, artificial intelligence, and big data analytics can enhance transparency, citizen engagement, performance monitoring, and financial oversight. However, these technologies also generate significant accountability challenges, including information overload, uneven digital capacity, fragmented responsibility in multi-actor

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ecosystems, algorithmic opacity, data interpretation risks, surveillance concerns, and exclusion arising from digital divides. The article argues that digital accountability is not merely a technical outcome of adopting new tools, but a socio-technical process shaped by institutional design, human capacity, ethical safeguards, data practices, and inclusive governance. It contributes by developing an integrative lens organized around accountability actors, forums, mechanisms, and risks. The review proposes a future research agenda focused on dialogic and horizontal accountability, AI and data intermediary governance, inclusive digital participation, accountability for unintended consequences, and frameworks that align digital innovation with democratic values, public trust, equity, and public value.

Keywords: public accountability; digital transformation; digital governance; algorithmic accountability; public sector; socio-technical systems.

1. Introduction

Public sector accountability refers to the obligation of government actors to inform, explain, and justify their decisions and performance to stakeholders, and to face consequences for failures. This obligation is undergoing profound change in the digital age. Over the past two decades, governments have adopted digital transformation initiatives, including e-government services, open data portals, social media engagement, advanced analytics, and artificial intelligence, with the promise of improving governance and accountability. These technologies create new channels for transparency, participation, and oversight. They can reduce information asymmetry and strengthen the public's ability to hold officials to account. From an agency theoretic perspective, broader disclosure is expected to improve monitoring, although this assumption requires closer scrutiny in digitally mediated settings. Open government data and online portals can make financial and performance information accessible in real time, while social media and civic technology platforms allow citizens to voice concerns and monitor public services directly (Barth and Arnold, 1999; Stamati, Papadopoulos and Anagnostopoulos, 2015; Arnaboldi, Busco and Cuganesan, 2017; Basilio, Pereira and Brum, 2019; Jiang *et al.*, 2019). Digital technologies also transform internal accountability processes. Big data analytics and machine learning can support performance oversight and fraud detection, while integrated information systems and automation can strengthen financial control and reporting integrity (Hoxha, Angjeli and Bombaj, 2025; Teixeira *et al.*, 2025). As a result, digitalization is increasingly viewed as a pathway toward more transparent, efficient, and responsive public governance (Tahir *et al.*, 2025; Teixeira *et al.*, 2025).

However, the relationship between digital transformation and public accountability is complex and double edged. Deploying technology does not automatically produce stronger accountability outcomes (Meijer, 2003; Margetts and Dunleavy, 2024). Digital initiatives can create unintended consequences and accountability paradoxes. Large volumes of data and real-time performance metrics may overwhelm users, invite misinterpretation, or require new forms of curation and data literacy before they can enhance transparency (Di Vaio and Mastellone, 2025; Mueller, Korać and Saliterer, 2026). Open data may also create "the shadow of surveillance", in which citizens are monitored even as they are invited to monitor government (Bertot, Jaeger and Grimes, 2012; Bekkers, Edwards and de Kool, 2013; Birchall, 2015). Social media campaigns may amplify some voices while marginalizing others, raising concerns about representativeness, inclusion, and unequal participation (Basilio, Pereira and Brum, 2019; Ahn and Wickramasinghe, 2021). Digital technologies can also blur traditional accountability boundaries. When algorithmic systems or private platforms become involved in public decision-making, responsibility may be dispersed among developers, bureaucrats, political leaders, vendors, and platform operators,

creating a "problem of many hands" (Bovens, Schillemans and Goodin, 2014; Wang, Yuan and Jiao, 2024). Recent research on artificial intelligence (AI) in government reinforces this concern. S. Wang *et al.* (2025) find that citizens perceive human officials as more legitimate account-givers and account-holders than automated systems, indicating public discomfort with machine-led accountability (Joaquim, Jorge and Pimentel, 2025; S. Wang *et al.*, 2025). These findings suggest that digital accountability is not a technocratic fix. It requires renewed attention to institutional roles, accountability norms, human capacity, and governance safeguards.

In response to these opportunities and challenges, scholarship on public sector accountability and digitalization has expanded rapidly. Agostino, Bracci and Steccolini (2022) identified 232 relevant articles published between 1998 and early 2020, demonstrating the diversity and growth of this field (Bovens, Schillemans and Goodin, 2014). Their review highlighted several emerging issues, including multicentric accountability, blurred accountability roles in networked governance, translation processes for data and algorithms, and the need to address social equity and inclusivity in digital reforms (Agrawal and Nair, 2018). Building on this foundation, recent studies published between 2021 and 2025 have introduced new evidence, conceptual refinements, and case-based insights into accountability in the digital era. Contemporary research examines how public organizations respond behaviorally to real-time performance dashboards (Agostino, 2025), how digital platforms influence citizen oversight (Davidyan and Waymire, 2025), and how emerging technologies such as AI and blockchain create new accountability questions (Abbas, 2025; Papenfuß and Wagner-Krechlok, 2025). Despite this growing body of work, the literature remains fragmented. Many studies examine specific technologies or accountability domains in isolation, including open data, social media, performance analytics, financial information systems, AI governance, and digital inclusion. This fragmentation limits conceptual understanding of how digital technologies collectively reconfigure accountability relationships in the public sector. A renewed synthesis is therefore needed to clarify how digital transformation reshapes accountability, what risks remain unresolved, and which research directions require further attention.

This article presents a critical integrative review of public sector accountability in the context of digital transformation. It synthesizes foundational and recent studies on digitalization, accounting, public administration, digital governance, and public accountability, including evidence from prior structured reviews and recent scholarship published during 2021–2025. The review methodology is described in the following section, including the review approach, sources, inclusion criteria, and analytical strategy used to synthesize the literature. The article addresses three guiding research questions:

1. How does digital transformation reshape accountability actors, forums, mechanisms, and risks in the public sector?
2. What opportunities and challenges do digital tools create for transparency, answerability, enforcement, contestability, and inclusion?
3. What theoretical and empirical gaps should guide future research on digital public accountability?

By addressing these questions, this article makes three contributions. First, it consolidates dispersed evidence on how digital tools reshape accountability relationships across transparency initiatives, citizen engagement, performance management, financial accountability, AI governance, and social equity. Second, it develops an integrative lens that organizes digital accountability around four interrelated dimensions: accountability actors, accountability forums, accountability mechanisms, and accountability risks. This framework moves the review beyond a

tool-based discussion of digital government by clarifying who is accountable, to whom accountability is owed, through which technological and institutional arrangements accountability is enacted, and what risks emerge in the process. Third, it proposes a future research agenda for advancing accountability in digitally mediated public governance.

The remainder of the article is organized as follows. The next section discusses the theoretical background of public accountability and digital transformation. The following section explains the review methodology, including the approach used to identify, select, and synthesize the reviewed literature. The article then examines methodological trends in the reviewed studies. Next, it discusses key thematic areas where digital technologies and accountability intersect, including transparency, citizen engagement, performance management, financial accountability, AI governance, and social equity. The subsequent section identifies emerging directions and unresolved issues, including dialogic accountability, blurred accountability boundaries, data intermediaries, and the governance of algorithms. The discussion then synthesizes implications for theory and practice, before the conclusion summarizes the article's contribution and future research agenda.

2. Theoretical Background: Accountability and Digital Transformation in the Public Sector

Public accountability in government refers to the requirement for public officials and institutions to answer for their actions, justify their decisions, and face consequences for poor performance or misconduct. It is a relational and multi-dimensional concept that involves account-givers, account-holders, forums of judgment, mechanisms of explanation, and possible consequences (Sinclair, 1995; Bovens, Schillemans and Goodin, 2014). Sinclair (1995) describes accountability as a "chameleon" because it takes different forms, including hierarchical accountability to superiors or oversight bodies, legal accountability to courts and laws, professional accountability to standards and ethics, and political accountability to citizens and elected representatives. Bovens, Schillemans and Goodin (2014) similarly emphasize that public accountability involves multiple rationalities and interests that must be balanced. For the purpose of this review, accountability is understood not only as a formal reporting obligation, but also as a relational process through which public actors provide information, offer justification, are questioned by accountability forums, and may face correction, sanction, or learning.

Traditional models of public accountability often draw on principal agent theory. Citizens, legislatures, or oversight bodies act as principals who delegate authority to public officials and agencies as agents. Because agents usually hold more information than principals, accountability mechanisms are designed to reduce information asymmetry, monitor conduct, and limit opportunism. In this view, transparency is central because disclosure of financial, operational, and performance information enables principals to evaluate whether government actions align with public expectations (Peixoto and Fox, 2016). An agency theoretic perspective therefore suggests that greater disclosure should improve monitoring and accountability (Davidyan and Waymire, 2025). However, disclosure alone is insufficient. Information may be too technical, too voluminous, poorly interpreted, or disconnected from meaningful consequences. Accountability therefore requires both answerability and enforcement. Answerability refers to the obligation to provide information and explanation, while enforcement refers to the capacity to impose consequences, correction, or sanction when failures occur. This distinction is important in digital settings because digital technologies can increase information visibility without necessarily strengthening interpretation, contestation, or enforcement.

Accountability also varies by direction and forum. Vertical or upward accountability refers to accountability to superiors, elected officials, legislatures, or higher authorities. Horizontal or outward accountability refers to accountability to the public, media, civil society, courts, audit institutions, or other oversight bodies. Inward accountability refers to accountability within organizations through professional norms, internal controls, and managerial procedures. These forms often overlap. For example, Davidyan and Waymire (2025) show that disclosure of local audit communications can strengthen outward transparency, but it can also create risks when complex information is misunderstood by public audiences. This example illustrates that accountability is not achieved simply by making information available. It depends on who receives the information, which forum has the authority and capacity to evaluate it, how information is translated into explanation, and whether consequences can follow from disclosure.

Digital transformation in the public sector refers to the integration of digital technologies into government operations, services, communication, and decision making processes in ways that fundamentally alter how public institutions function and interact with stakeholders (Mergel, 2017). It includes the shift from early e-government websites and online services toward open government data, social media engagement, smart governance, integrated information systems, artificial intelligence, and data-driven decision making. Digital transformation is not merely the adoption of individual technologies. It also involves redesigning workflows, developing new capabilities, restructuring organizational routines, and changing how governments relate to citizens, private providers, auditors, and other accountability actors.

Digital transformation is especially important for accountability because it datafies public administration. Activities that were once opaque, paper based, or difficult to observe can now generate digital traces that can be collected, analyzed, visualized, and shared (Redden, 2018). Agostino, Bracci and Steccolini (2022) note that technologies such as social media, sensors, open data platforms, and AI contribute to the datafication of society by producing large volumes of data that governments and stakeholders can use for monitoring and evaluation (Redden, 2018). Governments increasingly use digital tools to innovate service delivery and create new forms of interaction with citizens (Bertot, Jaeger and Grimes, 2012; Charalabidis and Loukis, 2012; Munteanu and Newcomer, 2020). However, datafication does not automatically produce accountability. Digital data must be selected, processed, interpreted, contextualized, and acted upon before they can support public scrutiny or institutional learning.

Two broad theoretical expectations shape the literature on digital transformation and accountability: empowerment and complexification. The empowerment perspective argues that digital tools can strengthen accountability by improving transparency, participation, monitoring, and control. Big data and analytics can support performance measurement and the detection of irregularities or inefficiencies (Kankanhalli, Lee and Lim, 2011; Giannakopoulos, Tsoumakos and Koziris, 2018). Social media and crowdsourcing platforms can give citizens direct channels to report problems, demand answers, and participate in public scrutiny, thereby supporting more horizontal and dialogic accountability (Bryer, 2013; Agostino and Arnaboldi, 2016). E-government transparency has also been associated with citizen trust and engagement (Meijer, 2003; Song and Lee, 2016; Porumbescu, 2017), while government use of social media has been linked to perceptions of greater accountability and reduced corruption (Agostino and Arnaboldi, 2017; Jiang *et al.*, 2019; Lee, Kim and Byun, 2021). Digital platforms can also facilitate cross-boundary information sharing, enabling media, civil society organizations, watchdog groups, auditors, and citizens to scrutinize government action simultaneously. This supports multicentric accountability, in which several actors can question, evaluate, or challenge public institutions

(Vanhommerig and Karré, 2014). From this perspective, digital technologies may strengthen the mechanisms of disclosure, monitoring, participation, and control that underpin public accountability.

The complexification perspective emphasizes that digital transformation also creates new accountability difficulties. Digital governance often involves private technology firms, software vendors, algorithm developers, data intermediaries, platform providers, and citizen co-producers. These actors complicate the traditional question of who is accountable, to whom, for what, and through which forum (Ingram Bogusz, Magnusson and Rost, 2025). When an AI-supported system denies a service, wrongly targets an individual, or produces biased recommendations, responsibility may be distributed across public agencies, developers, data providers, managers, and automated systems. This illustrates the "many hands" problem in algorithmic accountability and shows the need for clearer responsibility allocation (Bovens, Schillemans and Goodin, 2014; D. Wang *et al.*, 2025).

Digital transformation also makes accountability dependent on data translation and interpretation. As digital systems generate large volumes of data, public managers, accountants, auditors, analysts, IT experts, and platform designers become important intermediaries. They translate raw data into indicators, dashboards, narratives, audit findings, and policy recommendations. These translation processes influence how accountability problems are defined and how stakeholders respond. For example, Mueller, Korać and Saliterer (2026) show that technical choices in graph design can affect how politicians and staff interpret performance trends and whether they intend to communicate those results. This finding shows that accountability depends not only on data availability, but also on data quality, visualization, interpretation, and the integrity of intermediaries.

Digital transformation also raises equity concerns. Digital tools can democratize access to information, but they can also exclude citizens who lack internet access, digital literacy, language support, or trust in online government systems (Van Deursen and Van Dijk, 2015). Algorithmic systems may reproduce or amplify bias against marginalized groups. Internal digital reforms may also reproduce unequal labor relations. Di Vaio and Mastellone (2025) show that digital carbon accountability work may be gendered, with women performing much of the data work while strategic decisions remain male-dominated. These examples indicate that digital accountability must be evaluated not only by the amount of information disclosed, but also by who can access, interpret, challenge, and benefit from that information.

Taken together, the literature suggests that accountability in the digital era should be understood as a socio-technical construct. It combines classical accountability principles, including transparency, answerability, and enforceability, with digital technologies, data infrastructures, algorithmic systems, and networked governance arrangements. Digital accountability therefore extends beyond the traditional principal agent relationship. It includes algorithms, data processes, digital platforms, private vendors, citizens, professional intermediaries, and collaborative governance networks (Polzer and Öner, 2025). Polzer and Öner (2025), for example, argue that accountability in collaborative digital governance must consider the broader ecology of tools and actors involved, as well as the role of digital forums such as social media. The theoretical challenge is to preserve the core values of public accountability, transparency, justification, contestability, and alignment with the public interest while adapting accountability mechanisms to digital interdependence, automation, and datafication.

Building on this theoretical position, this review uses an integrative framework consisting of four interrelated dimensions: accountability actors, accountability forums, accountability

mechanisms, and accountability risks. Accountability actors refer to the individuals, organizations, technologies, and intermediaries that participate in accountability relationships, including public agencies, citizens, auditors, private vendors, algorithms, data analysts, and civil society organizations. Accountability forums refer to the formal and informal spaces in which account giving, questioning, judgment, and contestation occur, including legislatures, courts, audit institutions, media, social media platforms, public dashboards, and citizen participation forums. Accountability mechanisms refer to the technological and institutional arrangements through which information, explanation, monitoring, contestation, correction, and enforcement are organized. Accountability risks refer to the unintended or harmful consequences of digital accountability, including opacity, surveillance, exclusion, fragmentation, information overload, bias, and responsibility gaps.

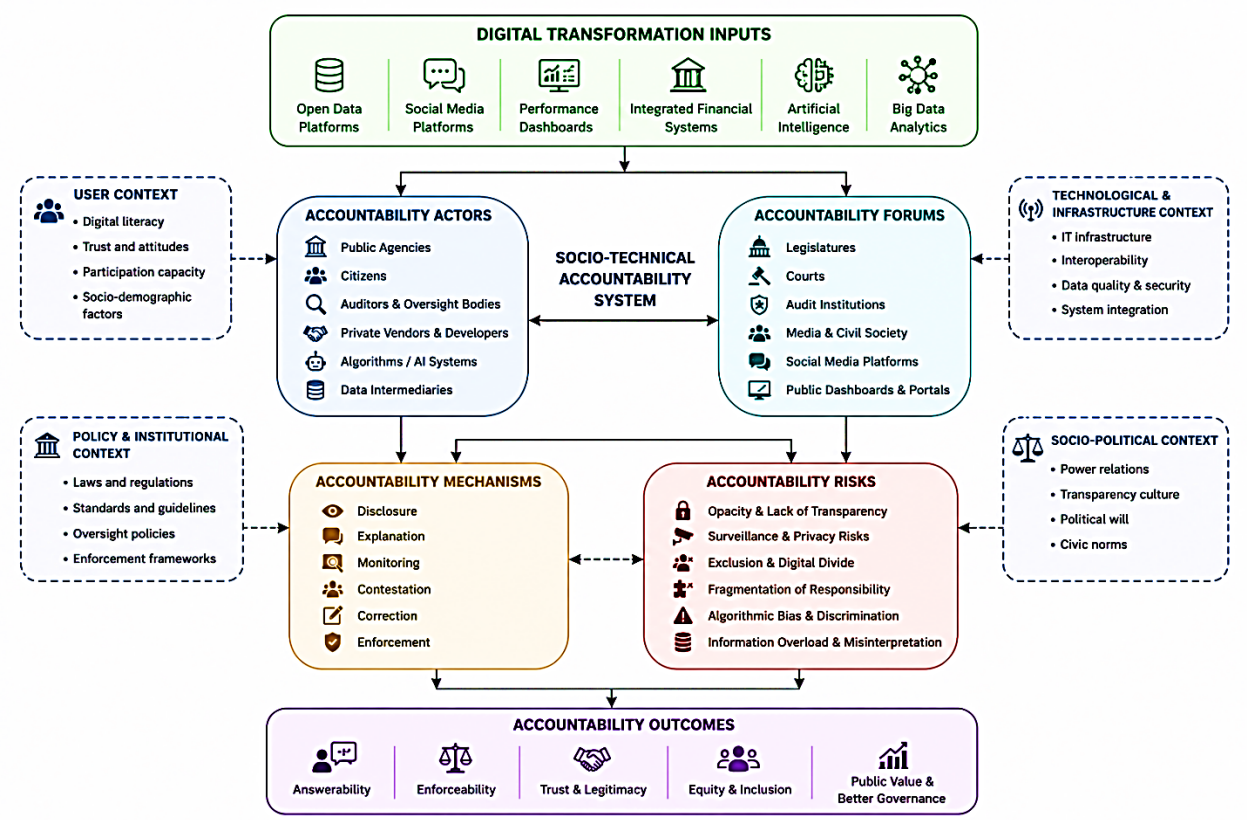

Fig. 1. An integrative framework of digital public accountability

This four dimensional framework is used throughout the thematic synthesis. In each theme, the review examines how digital technologies reshape who is involved in accountability, where accountability takes place, how accountability is enacted, and what risks emerge. Open data and dashboards, for example, expand accountability forums but may also create information overload. Social media can broaden citizen scrutiny but may produce unequal representation or surveillance. Financial information systems can strengthen audit trails but may introduce cybersecurity and system dependence risks. AI can support decision-making and oversight but may obscure responsibility and reduce contestability. By applying the same framework across themes, the review connects otherwise fragmented studies and clarifies how digital transformation changes the structure, practice, and consequences of public sector accountability.

3. Review Methodology

This article adopts a critical integrative review approach to synthesize literature on digital transformation and public sector accountability. This approach is appropriate because the field is conceptually broad, methodologically diverse, and distributed across public administration, public sector accounting, auditing, e-government, digital governance, information systems, and AI governance. Unlike a systematic review or meta-analysis, this review does not aim to statistically aggregate all available studies. Instead, it develops a structured conceptual synthesis of how digital transformation reshapes accountability actors, forums, mechanisms, and risks in the public sector (Bovens, Schillemans and Goodin, 2014; Mergel, 2017; Agostino, Saliterer and Steccolini, 2022; Argento *et al.*, 2025).

The literature base consisted of three main sources. First, the review drew on foundational accountability scholarship addressing transparency, answerability, enforcement, principal agent relationships, vertical and horizontal accountability, and accountability forums (Bovens, 2005; Bovens et al., 2014; Fox, 2015; Sinclair, 1995). Second, it incorporated studies on digital government and digital transformation, including e-government, open data, social media, performance dashboards, integrated financial systems, big data analytics, artificial intelligence, and algorithmic governance (Bovens, 2005; Bertot, Jaeger and Grimes, 2012; Agostino and Arnaboldi, 2016, 2017; Redden, 2018; Mergel, Ganapati and Whitford, 2021; S. Wang *et al.*, 2025). Third, it built on prior structured reviews and recent studies published mainly between 2021 and 2025 to capture new evidence on AI accountability, digital financial systems, performance analytics, platform mediated accountability, cybersecurity, sustainability reporting, and inclusion (Agostino, Saliterer and Steccolini, 2022; Argento *et al.*, 2025; Davidyan and Waymire, 2025; Ferry, Midgley and Ahrens, 2025; Polzer and Öner, 2025; Mueller, Korać and Saliterer, 2026).

Studies were included when they met three criteria. First, they examined digital transformation, digitalization, or specific digital technologies in a public sector, public administration, or public governance context. Second, they had a clear connection to accountability, transparency, oversight, participation, auditing, public financial management, performance reporting, algorithmic responsibility, trust, public value, or inclusion. Third, they contributed conceptual insight, empirical evidence, methodological development, or a future research agenda relevant to digital public accountability. Studies were excluded when they focused only on private sector digitalization, discussed technology adoption without accountability relevance, or provided purely technical descriptions without governance, institutional, or accountability implications.

The analytical strategy combined thematic synthesis with the integrative framework developed in the theoretical section. The selected studies were first grouped according to their main accountability focus. This process generated six thematic areas: transparency and open data, citizen participation and social media, performance measurement and analytics, financial management and auditing, AI and algorithmic accountability, and social equity and inclusion. Each theme was then analyzed through four dimensions: accountability actors, accountability forums, accountability mechanisms, and accountability risks. This strategy allowed the review to move beyond a tool-based discussion of digital government and examine how digital technologies reconfigure accountability relationships, spaces of scrutiny, mechanisms of answerability and enforcement, and risks of opacity, exclusion, surveillance, bias, and fragmented responsibility.

The review has several methodological limitations. Because it is a critical integrative review, it does not claim to provide an exhaustive mapping of every publication in the field or a statistical aggregation of findings. Its contribution lies in conceptual synthesis and agenda setting. The

review is also shaped by the availability of published and accessible English-language studies, which may underrepresent non-English scholarship and evidence from lower-capacity administrative contexts. Finally, the field is evolving rapidly, especially in relation to AI governance, algorithmic accountability, cybersecurity, and platform regulation. These limitations should be addressed in future research through systematic reviews, comparative studies, longitudinal designs, and more direct measurement of accountability outcomes (Wieringa, 2020; Agostino, Saliterer and Steccolini, 2022; Argento *et al.*, 2025).

4. Methodological Trends in Reviewed Studies

Research on digital transformation and public sector accountability has become methodologically diverse. Early studies mainly used qualitative case studies, descriptive analyses, website content analysis, and usability assessments to examine e-government initiatives, transparency portals, and ICT based accountability reforms. These studies were important because they documented how digital tools entered public administration and how they affected transparency, disclosure, and public communication. More recent qualitative studies have moved beyond describing adoption. They examine how public officials, auditors, citizens, and intermediaries interpret, resist, adapt to, or strategically use digital accountability systems. For example, case based and ethnographic studies on performance dashboards, carbon accounting systems, and public accounting information systems show that digital tools reshape accountability relationships through organizational routines, professional judgment, gendered labor, resistance, and institutional capacity (Agostino, 2025; Di Vaio and Mastellone, 2025; Hoxha, Angjeli and Bombaj, 2025).

Alongside qualitative work, quantitative studies have expanded as data on digital government adoption and accountability outcomes have become more available. Surveys, regression models, and structural equation modelling have been used to test relationships between digital transformation, transparency, trust, organizational capacity, and accountability. For instance, studies of municipalities, local parishes, and public service organizations show that digital adoption is shaped by institutional resources, administrative capacity, fiscal conditions, and leadership support (Bisogno, Cuadrado-Ballesteros and Abate, 2025; Gomes, Budding and Fernandes, 2025; Tahir *et al.*, 2025). These studies provide broader evidence on the conditions under which digitalization is associated with accountability-related outcomes. However, many quantitative studies still rely on proxy measures, such as the presence of a website, social media use, digital adoption scores, perceived transparency, or system use. Such indicators are useful but limited because they do not necessarily demonstrate answerability, enforceability, contestability, or actual consequences for public actors.

A further development is the growing use of experimental and quasi-experimental designs. These methods are valuable because they can isolate how specific digital design choices or institutional interventions influence judgment, behavior, communication, legitimacy, and compliance. For example, Mueller, Korać and Saliterer (2026) show that visual distortions in performance graphs can affect how politicians interpret and communicate performance information. S. Wang *et al.* (2025) examine public perceptions of legitimate account-givers and account-holders in AI assisted decision making, while D. Wang *et al.* (2025) use a quasi experimental design to assess how big data governance units affect reporting behavior. These studies indicate a shift from asking whether governments adopt digital tools to asking how particular digital accountability mechanisms shape decisions, perceptions, and actions.

Literature reviews and bibliometric studies have also helped consolidate this growing field. Structured reviews have mapped the development of digital accountability research, while bibliometric analyses have identified thematic clusters around accounting, auditing, e-government adoption, sustainability reporting, cybersecurity, digital trust, and AI governance (Agostino, Saliterer and Steccolini, 2022; Argento *et al.*, 2025; Joaquim, Jorge and Pimentel, 2025). These studies show that the field is expanding across several domains, but they also reveal conceptual fragmentation. Research often remains organized around specific technologies, such as open data, social media, dashboards, AI, or digital financial systems, rather than around accountability relationships. This review therefore uses the integrative lens of accountability actors, forums, mechanisms, and risks to connect findings across technological and disciplinary boundaries.

Overall, the methodological landscape of digital accountability research has become more pluralistic and rigorous. Qualitative studies explain how accountability is enacted in context; quantitative studies identify patterns and associations across cases; experiments and quasi experiments strengthen causal inference; and reviews or bibliometric studies map the intellectual structure of the field. Future research should build on this pluralism by moving beyond digital adoption as an outcome and examining stronger accountability indicators, including answerability, contestability, enforcement, trust, equity, learning, and institutional change. Table 1 summarizes the main methodological approaches used in the reviewed studies and highlights their specific contribution to understanding digital public accountability.

Table 1. Methodological approaches in reviewed studies on digital transformation and public accountability

Approach	Main Focus	Accountability Contribution	Representative Studies
Qualitative Case Studies	In-depth analysis of digital accountability initiatives, organizational routines, professional judgment, implementation processes, and contextual conditions.	Explain how actors interpret, resist, adapt to, or strategically use digital accountability mechanisms in specific institutional settings.	(Agostino, 2025; Di Vaio and Mastellone, 2025; Hoxha, Angjeli and Bombaj, 2025)
Surveys and Quantitative Analyses	Statistical analysis of digital adoption, transparency, organizational capacity, trust, and perceived accountability across organizations or jurisdictions.	Identify associations between digital transformation and accountability-related outcomes, while showing the limits of proxy indicators such as digital adoption or perceived transparency.	(Bisogno, Cuadrado-Ballesteros and Abate, 2025; Gomes, Budding and Fernandes, 2025; Tahir *et al.*, 2025)
Experimental Designs	Tests of how digital information, visualization, AI accountability arrangements, or	Provide stronger causal evidence on whether and how digital accountability mechanisms affect	(D. Wang *et al.*, 2025; S. Wang *et al.*, 2025; Mueller, Korać and Saliterer, 2026)

	governance interventions influence behavior, judgment, legitimacy, and compliance.	decisions, communication, and public perceptions.	
Literature Reviews & Bibliometrics	Structured synthesis, thematic mapping, co-word analysis, and identification of research clusters and gaps	Map the intellectual development of the field and reveal fragmentation across technology domains, accountability mechanisms, and disciplinary traditions.	(Agostino, Saliterer and Steccolini, 2022; Argento *et al.*, 2025; Joaquim, Jorge and Pimentel, 2025)
Mixed Methods Studies	Combination of qualitative and quantitative evidence or comparison across countries, sectors, organizations, and administrative contexts.	Link measurable accountability outcomes with contextual explanations and show how institutional capacity, digital maturity, and administrative culture shape digital accountability.	(Kant *et al.*, 2025; Tahir *et al.*, 2025; Yang *et al.*, 2025)

Source: Authors' elaboration based on the reviewed literature.

5. Key Themes: Digital Transformation and Accountability in Public Administration.

The reviewed literature shows that digital transformation affects public sector accountability across six interrelated themes: transparency and open data, citizen participation and social media, performance measurement and data analytics, financial management and auditing, AI and algorithmic accountability, and social equity and inclusion. These themes should not be understood merely as separate technology domains. Each theme reshapes accountability actors, forums, mechanisms, and risks in different but overlapping ways. The following synthesis therefore examines how digital tools expand or reconfigure who is accountable, to whom accountability is owed, how accountability is enacted, and what risks emerge in digitally mediated public governance.

5.1. Transparency and Open Data Initiatives

Transparency is one of the most common objectives of digital government reform. Governments have adopted open data portals, transparency websites, digital reporting systems, and online dashboards to disclose information on budgets, spending, procurement, service delivery, and performance indicators. These initiatives are grounded in the assumption that open access to information strengthens accountability by reducing information asymmetry and enabling external scrutiny. However, the reviewed literature shows that digital transparency does not automatically become accountability. The central distinction is between passive transparency, where information is technically available, and active accountability use, where citizens, journalists, civil society organizations, auditors, legislators, and other accountability forums can access, interpret, question, and act upon the information.

Early studies on online transparency assessed the availability, quality, accessibility, and usability of government information. Later research moved beyond disclosure and examined whether open data portals provide machine-readable formats, user tools, feedback mechanisms, and contextual information. These studies generally show that digital platforms have increased the quantity of government information available, but they also reveal substantial variation in data quality, usability, and interpretability. The accountability value of open data therefore depends not only on disclosure, but also on whether data can be transformed into meaningful information for public scrutiny.

Recent studies reinforce this point. Davidyan and Waymire (2025), for example, show that mandatory disclosure of local government audit communications may enhance outward accountability, but it may also create risks if complex audit information is misunderstood or misused. This finding challenges the assumption that more transparency is always better. Transparency requires mediation, explanation, and user capacity. Without these conditions, disclosure may generate confusion, symbolic compliance, or distrust rather than meaningful accountability.

The literature also shows that digital transparency is shaped by organizational capacity. Gomes, Budding and Fernandes (2025) demonstrate that Portuguese local parishes vary in their use of websites and Facebook for transparency, with organizational size, staffing, leadership, administrative restructuring, and broadband access influencing adoption. This evidence indicates that transparency reforms may reproduce institutional inequalities. Governments with greater administrative and technological capacity can provide more visible and usable information, whereas smaller or resource-constrained jurisdictions may remain less transparent despite facing similar accountability expectations.

Digital transparency can also produce concrete accountability effects when it is connected to institutional enforcement. D. Wang *et al.* (2025) show that the establishment of Big Data Administration bureaus in Chinese cities reduced firms' manipulation of R&D expenditures to obtain subsidies. This suggests that digital government capabilities can reduce information asymmetry and improve regulatory oversight. However, such effects are not automatic. They depend on data integration, analytical capacity, enforcement authority, and the ability of oversight actors to convert digital traces into corrective action.

Overall, transparency and open data initiatives strengthen accountability when four conditions are present. First, disclosure must be intelligible and relevant to users. Second, accountability forums must have the capacity to interpret and question the information. Third, institutions must provide channels for explanation, contestation, and correction. Fourth, consequences must follow when disclosed information reveals failure, manipulation, or misconduct. Without these conditions, digital transparency remains symbolic rather than substantive.

5.2. Citizen Participation and Social Media

Digital transformation has expanded the channels through which citizens can participate in accountability processes. Social media platforms, e-participation tools, online consultations, e-petitions, participatory budgeting platforms, complaint applications, and civic technology initiatives allow citizens not only to receive information but also to report problems, question authorities, mobilize public attention, and challenge official narratives. These tools broaden accountability forums beyond formal institutions and introduce more interactive, networked, and socially mediated forms of scrutiny.

The literature shows that governments increasingly use social media to communicate with citizens, but the accountability effects of such use vary considerably. Agostino and Arnaboldi (2016, 2017) show that many public agencies use social media primarily for information dissemination rather than dialogue. This distinction is important because communication does not necessarily equal participation, and participation does not necessarily produce accountability. Citizen voice becomes an accountability mechanism only when it leads to response, explanation, correction, institutional learning, or policy change.

Digital participation can create horizontal and dialogic accountability when citizens are able to question public authorities and receive meaningful responses. Online discussions of public services, citizen feedback platforms, and social media scrutiny can pressure officials to respond more quickly and visibly. However, the evidence remains mixed. Some studies show improved responsiveness and trust, while others show that digital participation remains symbolic, episodic, or weakly connected to formal decision-making. Social media should therefore be treated as a contingent accountability forum rather than an inherently democratizing technology.

Representativeness is a central challenge. Digital participation tends to be shaped by unequal access, digital literacy, socio-economic status, age, geography, and political interest. As a result, online accountability forums may amplify the voices of citizens who are already more connected and more capable of participating, while marginalizing those with limited digital access or lower trust in government. This creates the risk of an accountability illusion, where visible online engagement is mistaken for broad democratic participation.

The reviewed literature also highlights the dual nature of citizen facing digital tools. They can support accountability of government, where citizens scrutinize public authorities, but they can also enable accountability by government, where governments monitor citizen behavior through digital traces. This surveillance risk complicates the empowerment narrative. Digital participation must therefore be designed with safeguards for privacy, proportionality, transparency, and contestability.

Several studies illustrate both the potential and limits of digital participation. Participatory budgeting platforms can broaden access and reduce participation costs, but they often restrict citizens to voting or submitting proposals rather than deliberating, monitoring implementation, or evaluating outcomes. Civic hacktivism provides a more bottom-up form of digital accountability. Ingram Bogusz, Magnusson and Rost (2025) describe how parents in Stockholm responded to a poorly functioning school platform by developing an alternative application. This case shows that citizens can become technical accountability actors who expose service failures, redesign public interfaces, and challenge the boundaries of responsibility among public agencies, users, and technology providers.

Social media also functions as a real-time accountability forum during crises. Polzer and Öner (2025) show that debates over digital crisis tools can extend beyond a specific application and raise broader questions about expertise, legitimacy, and governance. These findings indicate that digitally mediated public debate can become an accountability arena in which trust and legitimacy are negotiated continuously. Public managers therefore need institutional procedures for listening, responding, correcting, and learning from online scrutiny, rather than treating social media engagement as a communication task only.

In synthesis, citizen participation and social media expand accountability by increasing the number and visibility of accountability forums. Yet they also generate risks of superficial engagement, unequal representation, misinformation, surveillance, and fragmented responsibility.

Digital participation becomes accountable governance only when citizen voice is inclusive, consequential, and institutionally connected to explanation, correction, and decision making.

5.3. Performance Measurement and Data Analytics

Digital transformation has significantly affected performance accountability in the public sector. Real-time information systems, interactive dashboards, big data analytics, benchmarking tools, and predictive models have expanded the capacity of governments to monitor, compare, and communicate performance. These technologies promise more timely and granular accountability because they allow public officials, oversight bodies, and citizens to observe trends that were previously available only through delayed reports. However, the reviewed literature shows that performance data are not neutral accountability objects. They are constructed, selected, visualized, interpreted, and acted upon within organizational and political contexts.

One major development is the spread of real-time performance dashboards. These tools replace static annual reports with frequently updated indicators that can be used by managers, ministries, oversight bodies, or the public. Dashboards can strengthen accountability by making performance gaps visible and by supporting faster managerial response. Yet visibility alone does not ensure accountability. Dashboards become accountability mechanisms only when their indicators are trusted, understandable, comparable, and linked to action.

Agostino (2025) shows that performance dashboards can generate complex behavioral responses. In the case of Italian state museums, some organizations engaged in competitive reactivity by adapting their behavior to improve dashboard indicators, while others questioned the validity, fairness, or meaning of the measures. This finding demonstrates that digital performance systems may produce both learning and strategic adaptation. Visibility can encourage improvement, but it can also encourage impression management, resistance, metric gaming, or decoupling between measured performance and substantive organizational goals.

Visualization is another accountability issue. Mueller, Korać and Saliterer (2026) demonstrate that graph design can influence how politicians interpret performance trends and whether they intend to communicate those results. This finding shows that accountability is affected not only by data availability, but also by interface design, visual framing, and data literacy. In digital accountability systems, dashboards, charts, and reporting interfaces operate as intermediaries between data and judgment. Their design therefore requires standards, ethical safeguards, and interpretive support.

Performance analytics also shifts accountability from backward-looking reporting to forward-looking prediction. Predictive systems can help governments allocate resources, identify risks, and detect service problems earlier. However, prediction introduces new accountability questions. If an algorithm identifies a citizen, school, neighborhood, or organization as high risk, public agencies must explain the evidence, assumptions, potential bias, and appeal mechanisms associated with that classification. Predictive analytics therefore connects performance accountability with algorithmic accountability and requires institutional forums for contesting data-driven judgments.

Citizen co-assessment is another emerging development. Barbera, Sicilia and Steccolini (2025) show that performance measurement and citizen participation are increasingly interconnected. Citizen feedback, scorecards, social audits, and online service evaluations can enrich performance assessment by incorporating lived experience and public value considerations. However, citizen-generated performance data may also create tensions with professional

measurement standards. The challenge is to combine technical reliability with democratic legitimacy.

Digital benchmarking and comparative dashboards can also create reputational accountability. Rankings and league tables can encourage peer learning and improvement, but they may also narrow attention to measurable indicators and encourage organizations to "teach to the test." Papenfuß and Wagner-Krechlok (2025) show that integrated information systems may increase the use of financial and economic performance data without necessarily increasing attention to social or environmental outcomes. This suggests that digital performance systems may reinforce attention to easily quantifiable indicators unless governance frameworks explicitly require broader public value dimensions.

In summary, digital transformation strengthens performance accountability by improving timeliness, visibility, comparison, and analytical capacity. At the same time, it creates risks of data overload, metric capture, gaming, visualization bias, weak interpretation, and narrow performance definitions. The literature therefore points to the need for meta-accountability: accountability for the design, quality, interpretation, and consequences of the performance accountability tools themselves.

5.4. Financial Management, Auditing, and Digital Accountability

Financial accountability has long been a core dimension of public sector accountability because governments must demonstrate that public funds are properly used, reported, audited, and aligned with public purposes. Digital transformation has reshaped public financial management and auditing through enterprise resource planning systems, digital budgeting tools, e-procurement, online budget portals, audit analytics, automated controls, cloud-based accounting systems, and AI-supported financial analysis (Argento *et al.*, 2025; Teixeira *et al.*, 2025). These technologies can strengthen audit trails, reduce manual errors, speed up reporting, and improve oversight (Hoxha, Angjeli and Bombaj, 2025; Teixeira *et al.*, 2025). At the same time, they introduce new accountability risks related to cybersecurity, system dependence, hidden digital costs, data governance, and unequal capacity (Argento *et al.*, 2025; Ferry, Midgley and Ahrens, 2025).

Integrated financial systems can improve internal accountability by producing more reliable and traceable financial records. Automation reduces repetitive manual work and may reduce opportunities for manipulation or error. E-procurement systems, for example, can log transactions, flag irregularities, and create searchable records for audit purposes. Teixeira *et al.* (2025) and Hoxha, Angjeli and Bombaj (2025) show that digital financial systems can improve reporting accuracy, budget monitoring, and process efficiency. However, these benefits depend on system quality, user competence, data integrity, and the willingness of organizations to act on detected irregularities.

Digitalization also changes external financial accountability. Online budget portals, open spending data, and popular reporting can make public finance information more accessible to citizens and civil society. Popular reporting translates complex financial statements into simplified, citizen oriented formats, including summaries, graphics, and explanatory narratives. Joaquim, Jorge and Pimentel (2025) note that popular reporting has potential to improve citizen understanding and public debate, but its accountability effects require empirical verification. Simplified reporting should therefore be assessed not only by readability, but also by whether it improves understanding, questioning, trust, and institutional response.

Auditing is also being transformed, although not always as radically as expected. Ferry, Midgley and Ahrens (2025) show that digital auditing may be incremental rather than revolutionary because supreme audit institutions and internal audit bodies face constraints related to mandate, access to data, legal authority, legacy systems, professional norms, and staff capacity. Audit analytics can expand scrutiny from sample-based testing to broader data analysis, but audit institutions themselves become accountable for the tools they use. If audit algorithms or anomaly detection systems are inaccurate, biased, or poorly governed, they can undermine audit credibility.

Cybersecurity and IT controls are now central to financial and administrative accountability (Argento *et al.*, 2025; Ferry, Midgley and Ahrens, 2025). A data breach, ransomware attack, or system failure is not only a technical incident. It is an accountability failure involving stewardship of public information, continuity of services, risk management, and public trust. Digital financial systems therefore require controls over access, data protection, interoperability, disaster recovery, and auditability (Ferry, Midgley and Ahrens, 2025; Teixeira *et al.*, 2025).

Digital transformation also raises new accounting questions. Governments increasingly invest in software, AI systems, cloud services, digital platforms, and data infrastructures. These investments create issues related to the recognition of digital assets, service contracts, liabilities, and long term commitments. If such costs and obligations are not reported transparently, stakeholders may underestimate the financial and governance implications of digital transformation. Accounting standards therefore need to evolve to ensure that digital era investments are reported in a comparable and accountable way (Heiling, 2025).

Financial accountability also intersects with performance and sustainability accountability. Digital financial systems are increasingly linked with performance dashboards, sustainability indicators, and sustainable development goal reporting (Manes-Rossi *et al.*, 2025; Pisarra and Marsilio, 2025). This expands the accountability object from compliance with budget rules to the public value generated by expenditure, including social, environmental, and intergenerational outcomes. However, this also requires governments to integrate financial, performance, and sustainability data without reducing accountability to what is easiest to quantify (Papenfuß and Wagner-Krechlok, 2025).

In synthesis, digital financial management and auditing strengthen accountability by improving audit trails, reporting speed, data integrity, transparency, and analytical capacity (Hoxha, Angjeli and Bombaj, 2025; Teixeira *et al.*, 2025). Yet they also create risks around cybersecurity, system dependence, hidden digital costs, unequal capacity, professional resistance, and overreliance on automated controls (Argento *et al.*, 2025; Ferry, Midgley and Ahrens, 2025). The key challenge is not simply to digitalize financial processes, but to ensure that digital financial systems remain auditable, explainable, secure, inclusive, and aligned with public value.

5.5. AI, Algorithms, and Accountability

Artificial intelligence and algorithmic decision making represent one of the most significant frontiers in public sector accountability. Unlike digital tools that primarily disclose, store, or visualize information, AI systems may classify, predict, recommend, or partly automate decisions that affect rights, resources, services, and public trust. This makes AI accountability distinctive. Algorithmic systems can influence public decisions, but they cannot be morally blamed, sanctioned, or questioned in the same way as human officials. This creates a potential accountability gap.

AI systems are increasingly used or piloted in areas such as eligibility determination, predictive policing, child protection, citizen service chatbots, risk scoring, fraud detection, and administrative process automation. These uses may improve consistency, speed, and analytical capacity, but they also raise the question of who remains accountable when decisions are influenced by automated systems. Public agencies cannot transfer responsibility to the algorithm or to private vendors. AI must therefore be embedded within human and institutional accountability structures.

S. Wang *et al.* (2025) show that citizens tend to perceive human officials as more legitimate account-givers and account-holders than automated systems in AI-assisted decision-making. This finding suggests that citizens expect public agencies and officials to remain answerable even when AI contributes to decisions. Human responsibility is therefore central to AI accountability. Governments need clear review, explanation, appeal, and override mechanisms for decisions supported by algorithmic systems.

The "many hands" problem is especially relevant in AI-enabled governance. Responsibility may be distributed among public managers, frontline officials, data scientists, software vendors, procurement officers, platform providers, and data infrastructures. Without explicit governance arrangements, this distribution can dilute accountability. Algorithm registries, model documentation, procurement clauses, impact assessments, audit rights, and independent oversight bodies can help make algorithmic systems more visible and contestable.

Explainability is important but insufficient on its own. Technical explanations of model logic do not guarantee democratic accountability if affected citizens cannot understand, challenge, or remedy algorithmic decisions. Algorithmic accountability therefore requires institutional contestability. Affected individuals and groups must have access to reasons, appeal channels, human review, and corrective mechanisms. Public agencies must also assess whether algorithmic systems produce unequal or discriminatory effects.

AI can also support accountability when used carefully. Large language models and other AI tools may help summarize citizen feedback, translate complex administrative procedures, detect anomalies, or improve the readability of public reports. However, these uses require human validation, transparent documentation, and safeguards against hallucination, omission, bias, and overreliance. AI can assist accountability only when it remains subject to accountable human oversight.

Platform mediated accountability is related but analytically distinct from AI decision-making. Online reviews, service ratings, and algorithmically curated complaints expose public professionals and agencies to continuous public evaluation. Morinière, Georgescu and Matilda Bez (2025), for example, describe online patient reviews as a form of emotional accountability. Such platforms can make service experiences more visible, but they also raise questions about representativeness, manipulation, platform power, and the relationship between informal public feedback and formal accountability systems. This literature should therefore be treated as part of broader platform-mediated accountability rather than as the core of AI accountability.

Collaborative digital governance further complicates responsibility. Polzer and Öner (2025) show that accountability in digital co-production and crisis technologies involves an ecology of public agencies, users, digital tools, experts, and online forums. This supports the idea of an accountability ecosystem in which responsibility is distributed but must not be diluted. Public agencies need governance arrangements that clarify who is responsible for design, deployment, monitoring, explanation, correction, and remedy.

In synthesis, AI accountability requires five interrelated safeguards: human responsibility, explainability, independent oversight, public engagement, and ethical capacity building. These safeguards are necessary to prevent an accountability vacuum in which neither the machine, the vendor, nor the public agency accepts responsibility for harm. The central lesson is that algorithmic accountability must be institutional, not merely technical.

5.6. Social Equity and Inclusion in Digital Accountability

Social equity and inclusion cut across all dimensions of digital accountability. The key question is whether digital transformation makes accountability more equitable or whether it creates new exclusions, biases, and power asymmetries. Early e-government reforms often assumed that digital tools would democratize information and reduce discretionary abuse. The reviewed literature offers a more cautious view. Digital accountability can expose inequalities and support redress, but it can also reproduce or deepen exclusion when access, literacy, representation, and remedies are uneven.

The digital divide remains a foundational concern. Citizens without reliable internet access, digital devices, language support, disability access, or sufficient digital literacy may be excluded from open data portals, online consultations, complaint systems, and social media-based accountability forums. This exclusion affects who can monitor government, who can ask questions, and who can benefit from responsiveness. Digital accountability may therefore privilege already connected groups unless governments provide hybrid online-offline mechanisms and targeted support.

Inclusive engagement requires more than making digital platforms available. Women, older citizens, rural communities, persons with disabilities, low-income groups, linguistic minorities, and other underrepresented groups may need accessible design, multiple communication channels, plain-language information, community facilitation, and trust-building measures. Participation becomes accountable only when diverse voices can influence agenda-setting, interpretation, response, and correction.

Equity also matters inside public organizations. Digital systems can redistribute accountability work in ways that reproduce gendered or professional hierarchies. Di Vaio and Mastellone (2025) show that digital carbon accountability systems may place technical data work on women while strategic decisions remain male-dominated. This finding demonstrates that digital accountability must be examined internally as well as externally. Researchers and practitioners should ask who performs data work, who receives recognition, who controls decisions, and whose expertise shapes digital governance.

Algorithmic bias connects social equity directly to AI accountability. Data driven systems may reproduce discriminatory patterns if training data, model design, or deployment contexts reflect existing inequalities. Accountability in such cases requires more than average system accuracy. Public agencies must be answerable for distributional harms across social groups and must provide mechanisms for correction, appeal, compensation, or policy change when digital systems produce unequal outcomes.

Digital tools can also support outcome equity when used to identify disparities and trigger institutional response. Data can reveal unequal service access, environmental burdens, budget allocations, or performance gaps across communities. However, documenting inequality is not enough. Equity-oriented accountability requires that disclosed disparities lead to explanation, corrective action, and monitoring of remedies. Without institutional response, digital systems may simply make inequality more visible without changing it.

Power dynamics are also central. Civic hacktivism, citizen generated data, and social media scrutiny may shift power toward citizens, while surveillance systems and platform controlled data may concentrate power in governments or private providers. Open data may empower scrutiny, but selective data design can also shape narratives and obscure responsibility. Inclusion should therefore not be reduced to access. Marginalized communities need influence over what data are collected, how they are interpreted, and which accountability priorities are pursued.

Global and intergenerational equity extend the accountability horizon. Digital sustainability dashboards, climate data, and Sustainable Development Goal indicators can make long term and cross generational consequences more visible. Yet accountability institutions often operate within short-term budgetary or electoral cycles. Integrating intergenerational equity into digital accountability requires mechanisms that make long-term consequences visible, contestable, and institutionally consequential.

In summary, equity should be treated as an evaluative criterion across all digital accountability initiatives. Every initiative should be assessed by asking who has access, whose voice is heard, whose data are represented, who may be harmed, and what remedies are available. Digital accountability is democratically legitimate only when it strengthens answerability, contestability, enforcement, trust, and equity for all groups, not only for those already able to participate in digital governance.

6. Cross-Theme Synthesis

Across the six themes, digital transformation expands accountability capacity while also increasing accountability complexity. It creates new actors, including data intermediaries, platform providers, civic technologists, vendors, algorithms, and AI systems. It also creates new forums, including dashboards, open data portals, social media platforms, participatory tools, algorithm registries, and digital audit systems. These forums and actors can strengthen mechanisms of disclosure, monitoring, explanation, contestation, correction, and enforcement. However, they also create risks of opacity, exclusion, surveillance, fragmentation, misinterpretation, bias, and diluted responsibility.

The central implication is that digital accountability should not be evaluated by the presence of digital tools alone. It should be evaluated by whether those tools strengthen answerability, enforceability, trust, equity, and public value. Table 2 summarizes the six thematic areas using the actors, forums, mechanisms, and risks framework.

Table 2. Thematic Synthesis of Digital Public Accountability

Theme	Main accountability actors	Key forums	Main mechanisms	Dominant risks
Transparency and open data	Public agencies, citizens, journalists, civil society, auditors, legislators, data intermediaries	Open data portals, transparency websites, audit disclosures, public dashboards, media	Disclosure, contextual explanation, data use, monitoring, questioning, enforcement	Information overload, misinterpretation, symbolic transparency, surveillance, unequal capacity

Theme	Main accountability actors	Key forums	Main mechanisms	Dominant risks
Citizen participation and social media	Citizens, public managers, civic technologists, platform providers, civil society, media	Social media, e-participation tools, participatory budgeting platforms, complaint systems, civic tech spaces	Citizen voice, feedback, public scrutiny, co-assessment, deliberation, institutional response	Superficial engagement, unequal representation, misinformation, surveillance, fragmented responsibility
Performance measurement and analytics	Public managers, analysts, auditors, political leaders, citizens, dashboard designers	Dashboards, internal reporting systems, rankings, scorecards, legislative hearings	Monitoring, benchmarking, visualization, predictive analytics, citizen co-assessment, correction	Metric gaming, visualization bias, narrow indicators, data overload, weak interpretation
Financial management and auditing	Finance officials, auditors, SAIs, accountants, IT staff, vendors, citizens	Audit institutions, budget portals, procurement systems, financial reports, open budget dashboards	Audit trails, automated controls, audit analytics, budget disclosure, cybersecurity controls	Cybersecurity failures, system dependence, hidden costs, unequal capacity, weak auditability
AI and algorithmic accountability	Public agencies, officials, vendors, data scientists, algorithms, citizens, regulators	Algorithm registries, courts, appeal systems, ethics committees, audit bodies, public consultations	Human review, explainability, impact assessment, documentation, audit, appeal, remedy	Accountability gaps, opacity, bias, discrimination, vendor dependence, weak contestability
Social equity and inclusion	Marginalized groups, citizens, data subjects, public agencies, civil society, advocacy groups	Hybrid forums, community platforms, accessibility channels, equity audits, complaint systems	Inclusive design, digital literacy, equity impact assessment, bias audit, appeal, remediation	Digital divide, exclusion, algorithmic discrimination, gendered labor, surveillance, weak remedies

Source: Authors' synthesis based on the reviewed literature.

7. Emerging Directions and Future Research Avenues

The reviewed literature shows that digital transformation expands the scope of public sector accountability while also making accountability more complex. Digital tools create new opportunities for transparency, citizen participation, performance monitoring, financial oversight, and algorithmic governance (Agostino and Arnaboldi, 2017; Mergel, Ganapati and Whitford, 2021; Agostino, Saliterer and Steccolini, 2022). At the same time, they introduce risks related to blurred responsibility, unequal participation, algorithmic opacity, surveillance, fragmented authority, and weak contestability (Bovens, 2005; Bovens, Schillemans and Goodin, 2014; Polzer and Öner, 2025; S. Wang *et al.*, 2025). Building on the actors, forums, mechanisms, and risks framework, this section identifies future research directions for advancing digital public accountability.

Future research should first examine how digital transformation changes accountability actors. Public accountability now involves not only public officials, agencies, citizens, and formal oversight bodies, but also technology vendors, platform providers, data analysts, algorithm designers, civic technologists, AI systems, and data intermediaries (Ingram Bogusz, Magnusson and Rost, 2025; Polzer and Öner, 2025; S. Wang *et al.*, 2025). Their roles in producing, processing, interpreting, and acting upon information remain insufficiently understood. Further studies should examine how responsibility can be allocated across public agencies, private providers, data infrastructures, and algorithmic systems without diluting accountability.

Second, future research should investigate how digital technologies reshape accountability forums. Social media platforms, open data portals, participatory budgeting systems, dashboards, algorithm registries, complaint platforms, and digital audit systems increasingly function as accountability arenas (Bertot, Jaeger and Grimes, 2012; Agostino and Arnaboldi, 2016, 2017; Davidyan and Waymire, 2025; Polzer and Öner, 2025). However, these forums may be symbolic, exclusionary, polarized, or weakly connected to formal institutions (Stamati, Papadopoulos and Anagnostopoulos, 2015; Basilio, Pereira and Brum, 2019). Research should therefore examine when digital forums generate genuine answerability and when they merely function as communication channels, consultation devices, or reputational spaces.

Third, future research should focus on accountability mechanisms. Digital systems can support disclosure, monitoring, comparison, explanation, contestation, correction, and enforcement (Agostino, 2025; S. Wang *et al.*, 2025; Teixeira *et al.*, 2025). Yet the literature shows that disclosure does not always produce understanding, dashboards do not always trigger corrective action, and participation does not always lead to institutional response (Agostino, 2025; Davidyan and Waymire, 2025; Mueller, Korać and Saliterer, 2026). Longitudinal and comparative studies are needed to assess whether digital transparency tools, performance dashboards, audit analytics, and AI governance systems produce answerability, enforcement, learning, trust, and public value.

Fourth, future research should give greater attention to accountability risks. Digital accountability may create information overload, algorithmic bias, surveillance, privacy intrusion, exclusion, metric gaming, cybersecurity vulnerabilities, and responsibility gaps (Birchall, 2015; Van Deursen and Van Dijk, 2015; Ahn and Wickramasinghe, 2021; S. Wang *et al.*, 2025; Mueller, Korać and Saliterer, 2026). These risks directly affect the democratic legitimacy of digital governance. Future studies should develop methods for identifying, measuring, and remedying digital harms through equity audits, algorithmic impact assessments, cybersecurity accountability studies, participatory evaluation, and comparative institutional analysis (Wieringa, 2020; Di Vaio and Mastellone, 2025; Ferry, Midgley and Ahrens, 2025).

Fifth, future research should examine cross-domain accountability. Digital tools increasingly connect financial accountability, performance accountability, sustainability reporting, public health governance, climate governance, and social welfare monitoring (Manes-Rossi *et al.*, 2025; Yang *et al.*, 2025). However, accountability systems often remain fragmented across policy domains, budget cycles, and institutional silos. Future research should examine how digital accountability can integrate public value, sustainability, and intergenerational outcomes without reducing accountability to easily measurable indicators (Papenfuß and Wagner-Krechlok, 2025).

An additional emerging research agenda concerns digital sovereignty, generative AI governance, and comparative international regulatory approaches. Future studies could examine how governments retain accountability over public data, digital infrastructures, and privately supplied AI systems; how generative AI changes the production, interpretation, and communication of public sector information; and how different national and supranational regulatory regimes allocate responsibility, oversight, contestability, and remedies. Comparative research across jurisdictions could help identify how institutional and regulatory differences shape the accountability consequences of digital transformation.

Finally, future research should strengthen methods and measurement. Many studies still use digital adoption, platform availability, or perceived transparency as proxies for accountability (Agostino, Saliterer and Steccolini, 2022; Gomes, Budding and Fernandes, 2025; Tahir *et al.*, 2025). Future studies should develop stronger measures of answerability, enforcement, contestability, trust, equity, institutional learning, and public value. Qualitative, quantitative, experimental, comparative, and longitudinal methods can each contribute to explaining whether digital systems produce meaningful accountability outcomes (Agostino, 2025; Bisogno, Cuadrado-Ballesteros and Abate, 2025; S. Wang *et al.*, 2025; Yang *et al.*, 2025; Mueller, Korać and Saliterer, 2026).

Table 3. Future Research Agenda for Digital Public Accountability

Framework dimension	Current gap	Future research question	Suggested method	Practical relevance
Actors	Responsibility is increasingly distributed across public agencies, vendors, platforms, data intermediaries, algorithms, and citizens (Bovens, 2005; Ingram Bogusz, Magnusson and Rost, 2025; S. Wang *et al.*, 2025)	How can responsibility be allocated in AI enabled and platform mediated public services without diluting accountability?	Case study, legal analysis, process tracing, procurement analysis.	Better AI governance, digital procurement, vendor accountability, and responsibility allocation.
Forums	Digital forums may be symbolic, polarized, unrepresentative, or weakly connected to formal	When does online participation produce genuine answerability rather than symbolic	Survey experiment, platform analytics, interviews,	Better design of participatory platforms, complaint systems, and online

Framework dimension	Current gap	Future research question	Suggested method	Practical relevance
	accountability institutions (Agostino and Arnaboldi, 2017; Basilio, Pereira and Brum, 2019; Polzer and Öner, 2025).	consultation or reputational management?	comparative case study.	accountability forums.
Mechanisms	Digital transparency and dashboards do not always lead to explanation, correction, enforcement, or learning (Agostino, 2025; Davidyan and Waymire, 2025; Mueller, Korać and Saliterer, 2026).	How do digital accountability mechanisms translate information into institutional response and corrective action?	Longitudinal study, comparative case study, field experiment, mixed methods.	Stronger performance governance, audit follow-up, and data-driven corrective systems.
Risks	Digital tools can create exclusion, bias, surveillance, cybersecurity vulnerabilities, and accountability gaps (Birchall, 2015; Van Deursen and Van Dijk, 2015; Wieringa, 2020; Ferry, Midgley and Ahrens, 2025).	How can public organizations identify, measure, and remedy digital accountability harms?	Equity audit, algorithmic impact assessment, cybersecurity audit, participatory evaluation.	More inclusive, secure, contestable, and trustworthy digital governance.
Cross-domain accountability	Digital accountability remains fragmented across financial, performance, sustainability, health, and social policy domains (Manes-Rossi *et al.*, 2025; Papenfuß and Wagner-Krechlok, 2025; Yang *et al.*, 2025).	How can digital accountability systems integrate public value, sustainability, and intergenerational outcomes?	Comparative policy analysis, longitudinal dashboard study, institutional analysis.	Better alignment between digital innovation, sustainability reporting, and public value creation.

Framework dimension	Current gap	Future research question	Suggested method	Practical relevance
Digital sovereignty and emerging AI regulation	Accountability for public data, digital infrastructures, generative AI, and privately supplied digital systems remains an emerging governance challenge (Autio *et al.*, 2024; European Union, 2024; OECD, 2024).	How do different institutional and regulatory regimes govern sovereignty, responsibility, oversight, and contestability in generative AI and digitally dependent public services?	Comparative regulatory analysis, cross-country case study, legal-institutional analysis.	Stronger data governance, generative AI oversight, regulatory learning, and public control over digital infrastructures.
Methods and measurement	Many studies still use digital adoption or perceived transparency as proxies for accountability (Agostino, Saliterer and Steccolini, 2022; Gomes, Budding and Fernandes, 2025; Tahir *et al.*, 2025).	How can accountability outcomes such as answerability, enforcement, contestability, trust, equity, and learning be measured more directly?	Scale development, mixed methods, experimental design, administrative data analysis.	More valid evidence on whether digital transformation strengthens accountability outcomes.

Source: Authors' synthesis based on the reviewed literature.

8. Discussion

8.1. Theoretical implications: digital accountability as a socio-technical and multi-actor process

This review shows that digital transformation should not be understood as a simple technological route to stronger public accountability. Digital tools can improve disclosure, monitoring, participation, and oversight, but they can also create opacity, fragmentation, exclusion, and responsibility gaps (Meijer, 2003; Bovens, Schillemans and Goodin, 2014; Agostino, Saliterer and Steccolini, 2022; Margetts and Dunleavy, 2024). The central theoretical implication is that digital accountability is a socio-technical and multi-actor process. It is shaped by the interaction between technologies, institutions, data practices, professional routines, accountability forums, and public values (Redden, 2018; Mergel, Ganapati and Whitford, 2021; Polzer and Öner, 2025).

The actors, forums, mechanisms, and risks framework developed in this article helps clarify this process. It shows that digital transformation changes who participates in accountability relationships, where accountability takes place, how accountability is enacted, and what new risks emerge. This framework moves the discussion beyond tool-based accounts of digital government. Open data portals, dashboards, financial systems, social media platforms, and AI tools are not accountability mechanisms by themselves. They become accountability mechanisms only when

they support explanation, questioning, contestation, correction, enforcement, learning, and trust (Davidyan and Waymire, 2025; S. Wang *et al.*, 2025; Mueller, Korać and Saliterer, 2026).

The review also extends traditional accountability theory. Principal agent models remain useful for explaining information asymmetry and the importance of disclosure, but they are not sufficient for understanding digital accountability (Roberts, 2002; Fox, 2015). Digital governance involves networked actors, automated systems, platform infrastructures, data intermediaries, and informal online publics (Ingram Bogusz, Magnusson and Rost, 2025; Polzer and Öner, 2025). Accountability therefore cannot be reduced to a linear relationship between principals and agents. It must be understood as distributed, relational, and mediated by socio-technical systems (Sinclair, 1995; Bovens, Schillemans and Goodin, 2014).

8.2. Practical implications: designing accountable digital governance systems

For practitioners, the review suggests that digital accountability must be designed rather than assumed. Public organizations should not evaluate digital reforms only by adoption rates, platform availability, or data publication. They should evaluate whether digital systems improve answerability, contestability, enforcement, equity, trust, and public value (Agostino, 2025; Davidyan and Waymire, 2025; Joaquim, Jorge and Pimentel, 2025).

Several design principles follow from the synthesis. First, transparency tools should be intelligible and usable. Open data and dashboards should include contextual explanation, accessible formats, visualization standards, and support for data literacy (Davidyan and Waymire, 2025; Mueller, Korać and Saliterer, 2026). Second, participation tools should be consequential. Citizen feedback, online consultations, participatory budgeting platforms, and complaint systems should be linked to institutional response, implementation tracking, and public explanation (Agostino and Arnaboldi, 2016, 2017; Polzer and Öner, 2025). Third, performance and financial systems should remain auditable and explainable. Automated controls, audit analytics, and integrated financial systems should include clear audit trails, governance controls, and mechanisms for follow up (Ferry, Midgley and Ahrens, 2025; Hoxha, Angjeli and Bombaj, 2025; Teixeira *et al.*, 2025). Fourth, AI systems should preserve human responsibility. Public agencies should provide human review, appeal channels, documentation, independent oversight, and remedies for algorithmically influenced decisions (Wieringa, 2020; S. Wang *et al.*, 2025).

The review also highlights the importance of organizational and professional capacity. Digital accountability requires skills in data interpretation, ethical judgment, cybersecurity, public communication, audit analytics, inclusive design, and algorithmic governance (Van Deursen and Van Dijk, 2015; Argento *et al.*, 2025; Ferry, Midgley and Ahrens, 2025). Without these capacities, digital systems may create more visibility without producing stronger accountability. Public organizations therefore need investment not only in technology, but also in people, institutions, and routines that enable accountable use of technology (Mergel, Ganapati and Whitford, 2021; Tahir *et al.*, 2025).

8.3. Policy implications: AI governance, data rights, procurement, and inclusion

The findings also have implications for policy and regulation. Digital accountability depends on rules that clarify responsibility, protect rights, and ensure contestability (Bovens, Schillemans and Goodin, 2014; Wieringa, 2020). Public procurement contracts for digital systems should include transparency clauses, data access provisions, audit rights, cybersecurity standards, documentation requirements, and obligations for remedy when harm occurs. These provisions are especially

important when public services rely on private vendors, cloud providers, platform operators, or AI developers (Ingram Bogusz, Magnusson and Rost, 2025; Polzer and Öner, 2025).

AI governance requires particular attention. Public agencies should be required to document algorithmic systems, conduct algorithmic impact assessments, provide meaningful explanations, enable appeal, and maintain human responsibility for decisions (Wieringa, 2020; S. Wang *et al.*, 2025). Independent oversight bodies, audit institutions, ethics committees, and civil society organizations should have appropriate access to evaluate high risk digital systems. Accountability for AI should not be limited to technical explainability; it should include institutional responsibility, public contestability, and remedies for affected individuals and communities (Asaro, 2019; Benbouzid, 2019; S. Wang *et al.*, 2025).

Inclusion should also be treated as a core policy requirement. Digital accountability initiatives should be assessed by asking who has access, whose voices are represented, whose data are used, who may be harmed, and what remedies are available (Van Deursen and Van Dijk, 2015; Di Vaio and Mastellone, 2025). Governments should combine digital channels with offline mechanisms, plain language reporting, accessibility standards, multilingual communication, and targeted support for digitally excluded groups. Without such measures, digital accountability may strengthen the voice of already connected citizens while weakening accountability to marginalized communities (Van Deursen and Van Dijk, 2015).

8.4. Limitations of the review

This review has several limitations. First, because it is a critical integrative review rather than a full systematic review or meta analysis, it does not claim to provide an exhaustive mapping or statistical aggregation of all studies in the field. Its main contribution is conceptual synthesis. Second, the review is shaped by the availability of published and accessible English-language studies, which may underrepresent non-English scholarship and evidence from lower capacity administrative contexts. Third, the field is evolving rapidly, especially in relation to AI governance, algorithmic regulation, cybersecurity, and platform accountability (Asaro, 2019; Wieringa, 2020). Some findings may therefore need updating as new technologies, regulations, and empirical evidence emerge. Fourth, the reviewed literature remains uneven across regions and sectors. Evidence from advanced digital governments, Western contexts, and well resourced public organizations is more visible than evidence from developing, rural, or lower capacity settings (Gomes, Budding and Fernandes, 2025; Kant *et al.*, 2025; Tahir *et al.*, 2025). Future research should address these limitations through systematic reviews, comparative studies, longitudinal designs, and stronger empirical measurement of accountability outcomes.

9. Conclusion

Digital transformation is reshaping how public sector accountability is produced, communicated, contested, and enforced. This review shows that digital technologies can strengthen accountability by expanding transparency, enabling citizen participation, improving performance monitoring, enhancing financial oversight, and supporting data-driven governance. At the same time, these technologies can complicate accountability by creating information overload, algorithmic opacity, surveillance risks, unequal participation, fragmented responsibility, cybersecurity vulnerabilities, and weak contestability.

The article contributes to the literature by synthesizing six themes of digital public accountability: transparency and open data, citizen participation and social media, performance measurement and data analytics, financial management and auditing, AI and algorithmic

accountability, and social equity and inclusion. Across these themes, the review develops an integrative framework organized around accountability actors, forums, mechanisms, and risks. This framework clarifies that digital accountability is not a technical outcome of adopting digital tools. It is a socio-technical process that depends on institutional design, human capacity, data practices, ethical safeguards, inclusive participation, and enforceable mechanisms of correction and remedy.

For research, the review highlights the need to move beyond studies of digital adoption and perceived transparency toward stronger measures of answerability, enforcement, contestability, trust, equity, institutional learning, and public value. For practice, it emphasizes the need to design accountable digital systems through data literacy, usable transparency tools, inclusive participation channels, algorithmic impact assessments, audit rights, cybersecurity safeguards, human oversight, and hybrid online offline mechanisms. For policy, it underscores the importance of clear rules for AI governance, data rights, procurement, vendor responsibility, accessibility, and remedies for digital harm, while emerging issues such as digital sovereignty, generative AI governance, and cross jurisdictional regulatory differences warrant further comparative attention.

The central lesson is that digital innovation must remain accountable to democratic values. Digital tools can support better governance only when they are understandable, contestable, inclusive, auditable, and connected to meaningful institutional response. Public sector accountability in the digital era therefore requires more than technological modernization; it requires governance arrangements that align digital innovation with democratic control, public trust, equity, and public value.

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