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Technology, Drivers, and Fraud Prevention in The Public Sector: a Scoping Review

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Abstract

Financial fraud in the public sector remains a persistent challenge that undermines governance, accountability, and public trust. Although previous reviews have examined aspects of fraud and forensic accounting, limited attention has been given to how technology, fraud drivers, and prevention mechanisms interact within the public sector context. This study aims to map and synthesize recent literature to understand the role of technology, key drivers, and prevention strategies in mitigating public sector financial fraud. Using [Arksey and O'Malley \(2005\)](#) scoping review framework, this study systematically identified and analyzed 10 peer-reviewed journal articles published between 2021 and 2025. The findings reveal that technologies such as big data analytics and blockchain significantly enhance fraud detection and transparency, while weak internal controls and permissive organizational culture remain major drivers of fraud. Preventive mechanisms, including forensic auditing and strong governance structures, demonstrate effectiveness in reducing fraud risk. This review contributes to the literature by integrating three dimensions, technology, fraud drivers, and prevention, in a single analytical framework, offering a more comprehensive understanding of public sector fraud mitigation than prior reviews. The study highlights research gaps in long-term policy evaluation and cross-sectoral learning between public and private entities, providing directions for future research and policy development.

JEL Classification: H83, M42, O33

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Introduction

Fraud is a crime aimed at unlawfully obtaining money (Abdallah et al., 2016). Financial fraud involves illegally acquiring funds or property by deception or abuse of trust (Podkolzina et al. (2021) and can result in major losses for large organisations (Kratcoski, 2018). Fraudsters adapt to exploit gaps in existing safeguards (Hilal et al., 2022). Fraud tends to rise during economic downturns (Blanque, 2003). Research shows that optimising analysis prevents fraud more effectively than detection alone (Alfian et al., 2023).

Financial fraud in the public sector remains one of the most critical threats to transparency, accountability, and effective public financial management. Fraudulent practices such as corruption, embezzlement, and financial reporting manipulation weaken governance systems, erode public trust, and hinder socio-economic development (Transparency International, 2022; ACFE, 2023). Despite ongoing reforms, the complexity of public sector operations and weak internal control systems continue to create opportunities for fraud (PwC, 2022). Fighting corruption is not just a technical issue related to public sector accountability and transparency, but also concerns the relationship between the government and citizens and increased citizen involvement in monitoring the actions of public authorities (Lyrio et al., 2018).

Recently, big data analytics, blockchain, and artificial intelligence have aided fraud detection and prevention (Deloitte, 2023). However, public institutions, especially in developing economies, face challenges in adopting these technologies due to cost and capacity issues. Organizational culture, governance, and regulatory gaps remain key but underexplored drivers of fraud.

Previous studies and reviews have primarily focused on forensic accounting (Kaur et al. (2023) or corruption control mechanisms (Gotelaere & Paoli, 2022). However, few have systematically examined the intersection of technology implementation, fraud drivers, and public sector prevention efforts. Most existing reviews do not provide a structured synthesis of how these elements interact to build fraud resilience. This lack of integrated analysis highlights a significant research gap: an absence of comprehensive frameworks that capture the multidimensional nature of public sector fraud mitigation.

Therefore, this study aims to conduct a scoping review to systematically identify and synthesize recent scholarly literature (2021–2025) on the intersection of technology adoption, key fraud drivers, and preventive mechanisms in the public sector. Using the Arksey and O'Malley (2005) framework, the review will chart the presence, effectiveness, and interrelations of these components. Specifically, the study will: 1) Develop an integrated framework illustrating how technology, fraud drivers, and prevention strategies interact; 2) Pinpoint specific gaps in empirical and policy-oriented research; and 3) Recommend targeted actions to enhance governance and fraud resilience in public sector institutions.

Method

The scoping review provides a clear indication of the volume of literature and studies available and an overview (broad or detailed) of its focus, and is an ideal tool for determining the scope or coverage of a body of literature on a particular topic (Munn et al., 2018). This scoping review follows Arksey and O'Malley (2005) framework, which includes: (1) identifying the research question, (2) identifying relevant studies, (3) selecting articles, (4) mapping the data, and (5) collating, summarising, and reporting the findings.

Identifying the Research Question

The research question is crucial for guiding the study's focus. In this context, the research question is: "What is the role of technology, driving factors, and prevention efforts in financial fraud?"

Identifying Relevant Studies

Keywords are used to obtain literature relevant to the research topic. The primary search terms are "financial fraud" AND "public sector," ensuring articles are directly related to both. Collected articles are classified by research question. The inclusion period, 2021-2025, was chosen due to significant developments in technologies such as big data, blockchain, and artificial intelligence (AI), which impact public sector fraud mitigation strategies. Focusing on recent literature allows this study to provide timely insights for using technology to detect and prevent financial fraud in the public sector.

This 2021–2025 review period reflects the post-pandemic acceleration of big data analytics, blockchain, and AI in the public sector, as well as emerging regulations and policy initiatives emphasizing transparency and data security. Limiting the review to this period ensures the analyzed literature is current and relevant to contemporary public financial management and anti-fraud strategies.

Table 1. Inclusion Criteria

Criteria	Inclusion	
Period	2021-2025	Publications within the last 4 years
Language	English	Articles published in English
Publication Type	Journal Articles	Only articles published in reputable journals
Geographic Region	All	Findings from various countries

Source: Processed by Researchers

Article Selection

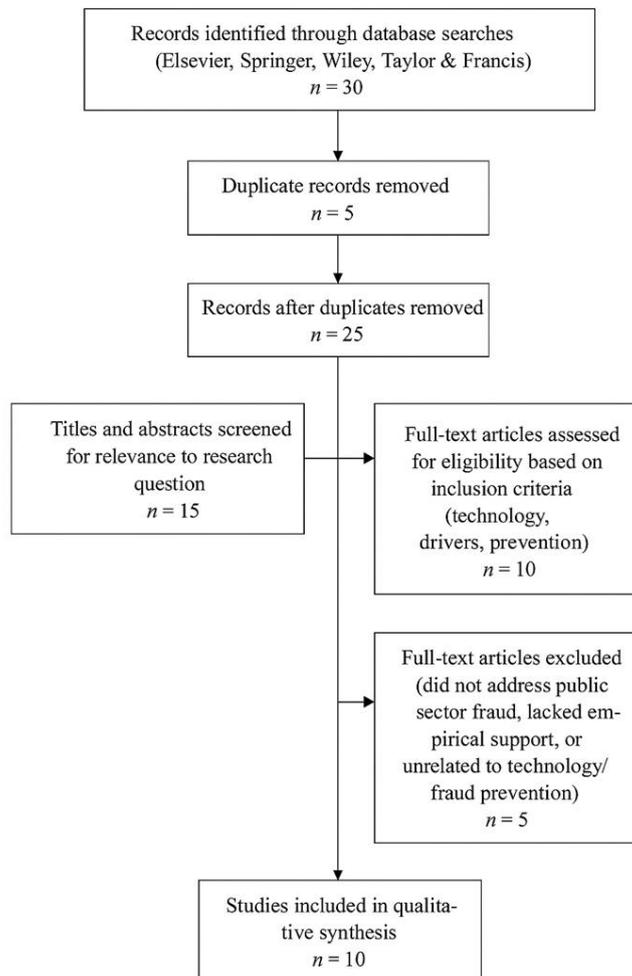


Figure 1. PRISMA systematic review flow diagram

Article searches were conducted across the Elsevier database and several additional sources, including Springer, Wiley, and Taylor & Francis, to ensure comprehensive coverage. By using keywords such as “public sector fraud,” ‘financial fraud prevention,’ ‘technology in fraud detection,’ and ‘drivers of fraud in public sector,’ 30 articles were identified at the initial stage. The articles identified were from various publishers and met the predefined inclusion criteria, namely:

1. International journal articles: Reputable international journal articles (ranked Q1 to Q4 based on SCImago Journal Rank).
2. Articles published in the range of 2021-2025 to ensure relevance to the latest developments in the field of mitigation technology and policy. developments in the field of fraud mitigation technology and policy.
3. Articles that focus on the topic of the role of technology, driving factors, and fraud prevention efforts in the public sector.

After the identification stage, the articles were screened by reviewing the titles and abstracts of the papers for relevance to the research questions. This process resulted in 25 relevant articles. The next stage of selection was to read the entire content of the articles to evaluate their suitability to the research focus, resulting in 10 articles being selected for further analysis.

The articles excluded in the final stage did not specifically address the main research topics, such as technology in fraud detection, the factors driving fraud, or fraud prevention strategies in the public sector. In addition, some articles were excluded because they only focused on the private sector or lacked supporting empirical data.

Data Mapping

During the data charting phase, the selected articles were reduced to summarize the most essential information. Data recorded included authors, year of study, location of study, aims, design/methods, and results. The collected articles were then refined to focus on public-sector financial fraud, covering topics such as the role of technology, driving factors, and prevention efforts. The findings are presented by exploring these aspects and discussing where future research needs to focus.

Collating, Summarizing, and Reporting Results

Organising, summarising, and reporting the findings is the final stage of the scoping review. This includes creating a table containing data extracted during the charting phase, summarizing key themes and patterns from the main findings, and producing a report in a format intended for publication. [Table 2](#) presents the results of the data compilation.

Table 2. Data Collection

No.	Authors	Year	Research Location	Method	Key Findings
1	Alrawashdeh et al.	2021	Jordan	Quantitative	The study found that the use of IT in forensic accounting is hampered by the cost of IT infrastructure, lack of training and the high cost of IT vendors. The results also showed that IT is an enabler of the role of forensic accounting in the detection of financial fraud.
2	Junaidi et al.	2024	Indonesia	Quantitative	The results show that policy skills significantly improve fraud detection. The positive impact of big data on fraud detection was also highlighted in the study.
3	Usman and Sundari	2024	Indonesia	Quantitative	The study found a significant positive impact on fraud prevention from having a village

No.	Authors	Year	Research Location	Method	Key Findings
4	Lascano et al.	2023	Ecuador	Quantitative	financial system, transparency and internal controls. The research revealed that during the COVID-19 pandemic, economic data manipulation and fraud were the most common cybercrimes, with financial statement fraud being a primary scheme used by perpetrators.
5	Dragomir et al.	2021	Romania	Case Study	The study found that separating ownership and control in state-owned enterprises enhances strategy implementation and helps address financial difficulties. It also emphasized improving governance in state-owned enterprises by ensuring integrity and transparency in all managerial aspects to prevent corporate scandals.
6	Awale et al.	2025	Somalia	Quantitative	The study revealed that female public employees perceive financial crimes in Somalia's public sector as widespread, complex, and often concealed. A significant majority (76.6%) believe in their ability to prevent and detect these crimes. It identified the Fraud Triangle (Pressures, Rationalisation, Opportunities) and the Fraud Diamond (Capabilities) as key contributors. The study underscores the need for better governance, accountability, and transparency to combat financial misconduct effectively.
7	Hajjat et al.	2024	Jordan	Mixed Methods	The study highlighted that forensic accounting makes a significant contribution to fraud prevention by supporting government investigations, giving evidence in court and developing financial management systems.
8	Oyerogba	2021	Nigeria	Quantitative	The findings showed that adequate knowledge of economic loss calculation and financial statement analysis is crucial for forensic accountants.
9	Álava et al.	2021	Ecuador	Qualitative	The study demonstrated that forensic audits play a vital role in detecting and preventing public sector fraud. The application of forensic audit procedures and techniques was proven effective in identifying potential fraud and misuse of authority.
10	Aziz and Othman	2021	Malaysia	Quantitative (Survey)	The findings provided valuable insights into fraud awareness levels among practitioners and identified the most effective mechanisms and technologies for fraud prevention and detection in public organizations.

Source: Processed by Researchers

Result and Discussion

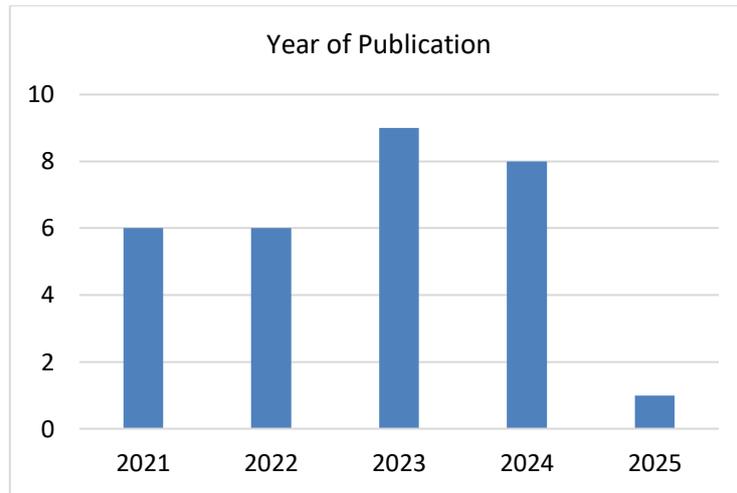


Figure 2. Distribution of reviewed studies by year of publication

Based on the graph presented, the publication trend for this research topic during 2021-2025 shows significant growth. The number of publications increased drastically in 2023 and 2024, with the highest peak in 2023. This suggests that the issue has received more attention in recent years, while the small decrease in 2025 is likely due to incomplete data. The 2021-2025 timeframe appears relevant as it reflects the current context of the emerging fraud issue.

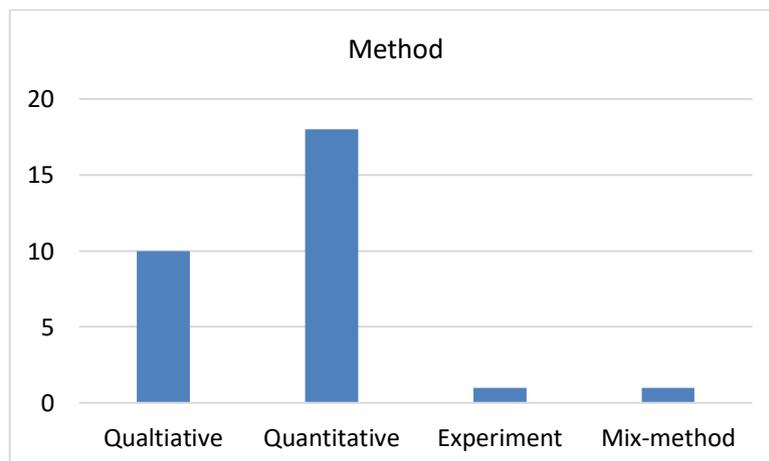


Figure 3. Distribution of reviewed studies by research method

In terms of research methods, the graph shows quantitative methods as the dominant approach, followed by qualitative methods. This suggests that statistical data-based approaches are the primary choice for analyzing the fraud phenomenon, although in-depth perspectives from qualitative methods are still used to understand the context and motivations behind fraud. Meanwhile, experimental and mixed methods appear to be rarely used, suggesting opportunities to explore alternative methods in this research.

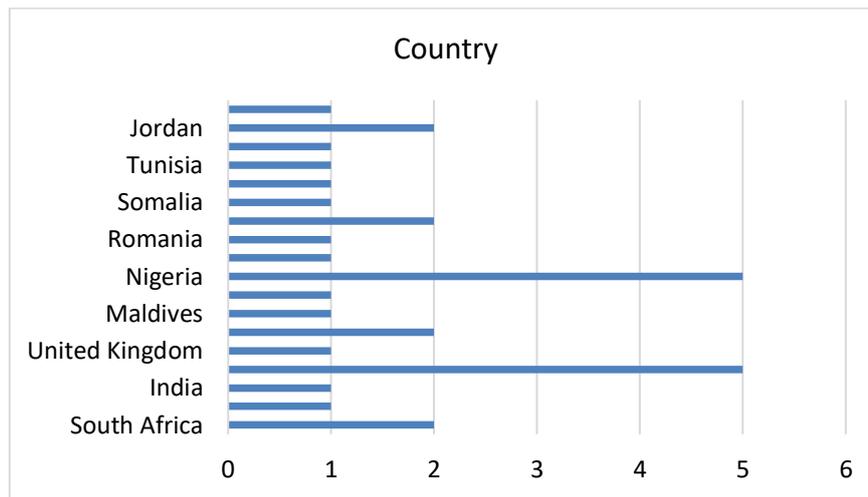


Figure 4. Distribution of reviewed studies by country of origin

In addition, the distribution of studies by country shows that Indonesia and Nigeria have the highest number of studies on this topic, followed by Russia, the UK, and several other countries. The dominance of Indonesia and Nigeria suggests either a high level of fraud or great academic attention to the issue in these countries. The diversity of countries involved in the research also indicates that fraud is a global problem, not limited to any particular region, providing a rich international context for the research. The overall analysis of these graphs supports the relevance of the research, both in terms of recent trends, methodological approaches, and the diversity of geographical contexts raised.

[Alrawashdeh et al. \(2021\)](#) found that the cost of IT infrastructure, the lack of training, and the high cost of IT vendors affect the use of IT in forensic accounting. The results also show that IT plays a role in forensic accounting in detecting fraud. [Junaidi et al. \(2024\)](#) found that political capability increases fraud detection. Their research also proves the positive impact of big data on fraud detection. In addition, research by [Usman and Sundari \(2024\)](#) shows that the village financial system has a significant positive impact on fraud prevention, transparency has a significant positive impact on fraud prevention, and internal control has a significant positive impact on fraud prevention.

[Lascano et al. \(2023\)](#) found that during the COVID-19 pandemic, economic data manipulation and fraud were the most common cybercrimes, with financial statement fraud as the most prevalent. In addition, [Dragomir et al. \(2021\)](#) found that separating ownership from control in state-owned companies can improve strategy implementation and help overcome the entity's financial difficulties. This research also reveals that to prevent corporate scandals, governance in SOEs needs to be improved by focusing on integrity and transparency in all managerial aspects. A study conducted by [Awale et al. \(2025\)](#) found that female civil servants perceived financial crimes in the Somali public sector as widespread, complex, and often hidden, with a large majority (76.6%) believing they could prevent and detect them. The main contributors to these crimes were identified as the fraud triangle (pressure, rationalisation, opportunity) and the fraud diamond (capability). The findings highlight the economic and social implications of financial crime, including increased government expenditure and impediments to socio-economic development. The study emphasises the need for improved governance, accountability, and transparency to effectively combat financial crime.

Table 3. Thematic Synthesis of Reviewed Studies

Theme	Key Findings	Identified Gaps / Limitations
Technology Use	Technologies such as big data analytics, blockchain, and AI enhance fraud detection and transparency (Junaidi et al., 2024 ; Usman & Sundari, 2024). Forensic accounting benefits from IT integration but faces challenges related	Limited evaluation of long-term implementation; lack of cost-benefit analyses; minimal exploration of hybrid

Theme	Key Findings	Identified Gaps / Limitations
Fraud Drivers	to infrastructure and training costs (Alrawashdeh et al., 2021). Weak internal controls, poor governance, and permissive organizational culture are recurring drivers (Dragomir et al., 2021; Awale et al., 2025). The Fraud Triangle and Fraud Diamond theories remain dominant explanatory models. during the COVID-19 pandemic, economic data manipulation and fraud were the most common cybercrimes (Lascano et al., 2023)	systems combining manual and digital controls. Few studies examine behavioral and institutional interactions; limited cross-country comparison on cultural or regulatory influences.
Prevention Mechanisms	Forensic accounting and internal audit functions play crucial roles in detecting and preventing fraud (Hajjat et al., 2024; Oyerogba, 2021). Forensic auditing improves transparency and accountability in public organizations Álava et al. (2021), while awareness and ethical culture significantly strengthen prevention effectiveness (Aziz & Othman, 2021).	Lack of comparative analysis of prevention mechanisms across regions; limited empirical testing of how technology enhances forensic audit practices; insufficient evaluation of long-term institutional capacity building.

Technology Use

Technology is now key to finding and stopping fraud in the public sector. Studies show that digital tools such as big data analytics, blockchain, and forensic accounting software make it easier to detect fraud, increase transparency, and improve audit quality. But using these technologies can be challenging due to high costs, poor digital infrastructure, limited training, and the need for external vendors.

The findings show that challenges in adopting fraud-prevention technology are not only technical but also related to institutional readiness and human capabilities. Studies show that the success of digital transformation in internal auditing depends heavily on audit professionals' digital skills and competencies (Bertacchini et al., 2024). While large companies are more likely to benefit from technology investments due to their greater resource capacity and organizational support Lugli and Bertacchini (2023), smaller institutions may struggle to do so. This indicates that low levels of digital maturity and the uneven distribution of capabilities among institutions hinder the full realization of technology's potential in fraud detection and prevention.

Junaidi et al. (2024) focused on studying how big data skills relate to fraud detection in public sector institutions. The positive impact of big data on fraud detection is demonstrated by its findings. Similarly, a study by Usman and Sundari (2024) found that village financial systems have a significant positive impact on preventing fraud. Building on this, research into blockchain infrastructure indicates it can substantially enhance existing monitoring systems and significantly improve the detection, prevention, and documentation of potential fraud (Benedetti et al., 2021). The combination of internal and external anti-fraud techniques, including filters, firewalls, encryption, continuous auditing, detection sampling, antivirus, financial metrics, digital analytics, and data mining, is an important factor in this regard (Akinbowale et al., 2024).

Kılıç (2020) states that the current digital business environment has made it more difficult to detect fraud using traditional methods. Relatedly, the widespread use of IT in fraud detection and prevention facilitates the development of a systematic approach to fraud investigation (Halbouni et al., 2016). Despite the positive impact of technology on auditing and fraud detection, concerns about its negative impacts remain a frequent topic of discussion. For instance, a synthesis by Gunibala et al. (2024) on the use of technology for remote auditing activities found that it can reduce auditor skepticism and concerns about data security. Other concerns include the potential for the auditing profession to be replaced by technology. However, in this case, research by Nguyen et al. (2024) corroborates informants who say that technology is unlikely to replace external auditors.

From a theoretical perspective, technology both reduces and alters the risk of fraud. Building on the previous discussion of technology's impacts, within the Fraud Triangle [Cressey \(1953\)](#), digital systems reduce the "opportunity" for manual manipulation but also create new vulnerabilities through algorithmic bias or system exploitation. In the context of the Fraud Diamond Theory [Wolfe and Hermanson \(2004\)](#), "capability" is the most dynamic component in the digital environment, where technological competence, data access, and cybersecurity skills can determine the likelihood of fraud. Therefore, fraud prevention in the digital age must go beyond automation by strengthening human capabilities, digital literacy, and ethical awareness among public officials.

Fraud Drivers

Fraud in the public sector continues to be driven by complex interactions between individual, organizational, and systemic factors. Connecting these drivers to traditional models, in line with classic frameworks such as the Fraud Triangle and Fraud Diamond, common driving factors include pressure, opportunity, rationalization, and capability ([Awale et al., 2025](#); [Avortri & Agbanyo, 2020](#)). Empirical studies [Lascano et al., \(2023\)](#); [Dragomir et al. \(2021\)](#) show that weak internal controls, poor documentation, and inadequate supervision remain the most frequent drivers of fraud.

This review reveals that governance reforms and fraud drivers interact dynamically. To illustrate, governance reforms such as stricter oversight, transparency initiatives, and strengthened internal audits—designed to reduce opportunities and rationales—often face political resistance, fragmented accountability, and moral hazard among stakeholders, which paradoxically can strengthen incentives for fraud. For example, [Dragomir et al. \(2021\)](#) show that separating ownership from control in state-owned enterprises improves governance but also creates new risks when informal relationships (e.g., favoritism or nepotism) dominate formal structures.

Many studies emphasize that fraud occurs due to weak supervision or weak internal control and governance ([Akomea-Frimpong et al., 2019](#); [Asmah et al., 2020](#); [Hidajat, 2020](#)). Extending this evidence to sector-specific risks, in the context of fraud in mobile financial services, research highlights the lack of advanced information technology tools to detect threats, inadequate education and training, and low staff salaries. In the context of the public sector, [Rustiarini et al. \(2019\)](#) show that the procurement of goods and services from the public sector is identified as a high-risk area for fraud (corruption) due to the interaction between situational factors (pressure and opportunity) and psychological aspects (rationalization), as well as the capacity of individuals to direct themselves to commit fraud.

These findings indicate that fraud theory must evolve to accommodate the influence of governance systems. Fraud is not merely the result of individual moral failure, but rather a structural outcome of institutional weaknesses and stakeholder conflicts of interest. Public organizations with low governance maturity are more vulnerable to fraud driven by rationalization and opportunity, especially when regulatory enforcement is weak or selective. Therefore, governance reform should not only focus on procedural compliance but also foster a culture of ethics, role integrity, and leadership accountability.

Fraud Prevention

The reviewed literature emphasizes the important roles of forensic accounting, internal control, and digital auditing in preventing fraud in the public sector ([Hajjat et al., 2024](#); [Oyerogba, 2021](#); [Álava et al., 2021](#); [Aziz & Othman, 2021](#)). In particular, Big Data analysis and continuous audit systems have proven effective in detecting anomalies in complex datasets [Shalhoob et al. \(2024\)](#), while forensic auditing strengthens institutional transparency and accountability ([Naz & Khan, 2024](#); [Alharasis et al., 2023](#)).

However, despite these advances, prevention is still hampered by uneven technological readiness, limited interagency collaboration, and a lack of skills among public officials. These weaknesses help explain why fraud continues to occur even in technology-enabled environments. From a policy perspective, this means

that technology alone cannot prevent fraud unless it is supported by strong governance structures and continuous capacity building. Accordingly, prevention mechanisms must integrate ethics training, forensic expertise, and real-time monitoring systems into a cohesive governance framework.

In another study, [Sow et al. \(2018\)](#) found that fraud prevention mechanisms are positively and significantly influenced by a culture of honesty and integrity, fraud prevention processes and controls, and appropriate oversight. Additionally, awareness of fraud is the single most influential factor in preventing financial statement fraud ([Mandal & S, 2023](#)). [Rifai and Mardijuwono \(2020\)](#) emphasize that auditor integrity and organizational commitment positively affect fraud prevention. Further evidence shows that strong corporate governance and IT practices are key to detecting and reducing fraud ([Halbouni et al., 2016](#); [Hassan et al., 2023](#)). Reviewing the use of technology in fraud prevention, [Shalhoob et al. \(2024\)](#) found that Big Data Analytics (BDA) improves fraud detection by integrating data from various sources, using advanced algorithms to identify anomalies, and enhancing detection accuracy. Existing research often highlights forensic accounting's role in fraud prevention. For example, research by [Naz and Khan \(2024\)](#) found that forensic accounting techniques, such as those used for investigations, have a positive impact on fraud detection and prevention. Similarly, [Alharasis et al. \(2023\)](#) also confirmed a significant correlation between fraud prevention and detection, demonstrating the benefits of applying forensic accounting (FA), FA implementation training, and FA application.

Theoretically, this review contributes to expanding the fraud model from a digital governance perspective. This review highlights that the traditional Fraud Triangle and Fraud Diamond need to be revised to include technological and institutional dimensions as new determinants of fraudulent behavior. This review proposes that digital capabilities be recognized as a modern extension of "capabilities" in the Fraud Diamond, emphasizing not only the ability to commit fraud but also the capacity to detect, deter, and report it.

In conclusion, the persistence of fraud despite technological advances reflects a mismatch between digital innovation and governance reform. To bridge this gap identified throughout the review, policymakers must encourage cross-sector learning, invest in digital infrastructure, and promote leadership driven by transparency. Ultimately, effective fraud prevention in the public sector requires alignment between technology, governance, and human ethics, a trinity that redefines the future of accountability in public financial management.

Conclusions and Recommendations

The reviewed studies show that technology adoption, fraud drivers, and fraud prevention mechanisms are key to understanding fraud mitigation in the public sector.

From a theoretical perspective, this review advances classical fraud theories by integrating a digital governance lens and makes two key contributions. First, it demonstrates that the technology-mediated opportunity dimension requires traditional models to now account for technological capability and institutional readiness. Second, it proposes that, within the Fraud Diamond, "capability" must encompass digital skills and access to data systems. Collectively, these findings suggest that digital capability acts as both an enabler and a deterrent in modern fraud contexts.

The review highlights three key policy contributions for governments and public institutions. First, pairing investments in big data analytics, blockchain-based accounting systems, and real-time auditing with human capacity building and governance reform prevents mere technological formalism. Second, institutionalizing cross-departmental data integration and transparency ensures that digital tools enhance, not just automate, fraud prevention. Third, establishing national frameworks for digital forensic accounting promotes

consistent and accountable practices across government. These findings emphasize that fraud prevention is a strategic governance priority that requires coordinated alignment among policy, ethics, and technology.

This review suggests three urgent directions for future research. First, cross-country comparative analyses can explore how differences in governance maturity, digital infrastructure, and cultural norms affect technology-based fraud prevention. Second, emerging technologies such as artificial intelligence (AI), machine learning, and blockchain should be integrated into fraud detection frameworks. Their predictive accuracy and cost-effectiveness should also be tested empirically. Third, longitudinal and behavioral studies can examine how internal control reforms and employee digital literacy evolve over time in reducing fraud risk.

Addressing these areas can bridge the gap between technological innovation and policy implementation. This review reframes fraud prevention through a digital institutional framework. It shows that public-sector fraud mitigation depends on the synergy among technology, governance, and ethical capacity.

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