



Digital Technologies to Eliminate Malpractices in the Public Sector of Developing Countries- A Literature Review

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Received: 14-10-2024.

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Accepted: 31-12-2024

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Published Online: 31-12-2024

Abstract-This literature review examines the role of digital technologies in addressing malpractices within the public sector of developing countries. Malpractices and other irregularities severely undermine the effectiveness of public sector services in these nations. The review highlights how integrating emerging digital technologies into public sector processes can mitigate these challenges. The objective of this study is to provide a comprehensive analysis of the literature on the application of digital technologies in the public sector, demonstrating how these innovations can enhance the sector's overall efficiency while eliminating irregularities and malpractices. By automating processes and incorporating digital technologies, including artificial intelligence models, it is possible to reduce reliance on unnecessary manpower and remove employees engaged in malpractices, thus improving the operational efficiency of government entities. This article identifies several theoretical and empirical gaps in the literature regarding the public sector's slow adoption of suitable digital technologies to tackle malpractices. The benefits and challenges of accelerating the adoption of digital technologies have been explored, and key digital technologies that have been successfully implemented in other contexts to combat malpractices have been identified. The study employed a comprehensive review of relevant peer-reviewed journal articles published between 2014 and 2024. The selected articles were critically evaluated and synthesized using a descriptive analysis approach, with irrelevant articles excluded. The study underscores the effectiveness of digital technologies in mitigating malpractices and irregularities in the public sector of developing countries, offering a step-by-step roadmap and practical solutions.

Keywords: digital transformation, digital technologies, public sector, corruption, developing countries, and malpractices

Suggested Citation

Kulatunge, M. J. P., Fernando, R. L. S., & Mahakalanda, I. (2024). Digital technologies to eliminate malpractices in the public sector of developing countries: A literature review. *Sri Lankan Journal of Technology*, 5(2), 34–54.



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1. Introduction

The government sector is expected to deliver its services to the public in a convenient and easily accessible way. It also controls the country's economy, since economic development depends solely on the effectiveness of the public sector. The citizens of a country rely heavily on the public sector and expect prompt responses to their demands. Digital infrastructure has been utilised on a massive scale since the COVID-19 pandemic for work and learning at home. This crisis could be demonstrated as an opportunity to embrace digitalisation in the public sector, automating public services and providing them through digital platforms. According to Hess et al., (2016), adopting emerging digital technologies in the public sector will create novel avenues for enhancing communication and collaboration with citizens to deliver better satisfaction. The impact of digital platforms was largely demonstrated in the private sector, while applications to the public sector were rarely recognised (Klein et al., 2020), especially in developing countries with low economies (Osabutey, & Jackson, 2019). Transparency International is the body that monitors the corruption patterns of countries worldwide (Transparency, 2024).

The government administration is searching for avenues to adopt digital technologies to mitigate malpractices and irregularities to enhance government services' efficiency, effectiveness, transparency and accountability (Xiao et al., 2022; Khan et al., 2021). This study aims to explore the applicability of various digital technologies in reducing malpractices in the public sector. Specifically, it will focus on Big Data Analytics, Cloud Computing, Artificial Intelligence (AI) and Machine Learning (ML), Robotic Process Automation, Blockchain Distributed Ledger Technology, Crowdsourcing Platforms, Digital Payment Systems, Cybersecurity Solutions, Digital Identity Verification, Computerized Information Systems, Electronic Government (e-Government) Systems, and Whistleblowing Systems (Meiryani et al., 2023; Nguar, 2022; Marjerison & Gatto, 2024; Sun & Medaglia, 2019; Lyra et al., 2022; Adam, 2021).

1.1 Problem Statement

Corruption, a form of malpractice, is a significant problem and a critical issue in developing countries, particularly in Sri Lanka. It obstructs economic development and undermines the rule of law. Public funds from the Treasury are frequently wasted and misused due to widespread corruption among government employees and politicians. These issues disproportionately affect the poorest segments of the population, both directly and indirectly.

According to Transparency International, the corruption index in many third-world countries has reached alarming levels. Transparency (2024) defines corruption as the misuse of authority for personal gain. The Corruption Perceptions Index ranks and scores the perceived levels of public sector corruption in 180 countries. For instance, Sri Lanka's public sector has a corruption score of 34 and ranks 115, highlighting significant governance challenges.

Corruption unfairly impacts the public sector, eroding trust, undermining good governance, misusing public resources, weakening democratic principles, distorting public policy, and stalling economic progress. Moreover, it exacerbates poverty, inequality, environmental crises, and social fragmentation. Malpractices and irregularities in public sector administration severely undermine the efficiency and effectiveness of services provided to citizens (Raeissi et al., 2019; Kankpang & Nkiri, 2019). Common forms of malpractice include corruption and bribery, nepotism and cronyism, procurement irregularities, embezzlement, bureaucracy, fraud, abuse of power, kickbacks, unethical behavior, misuse of public resources, and the existence of ghost workers. Such unethical practices erode public trust, reducing the credibility and effectiveness of government services (Mugellini et al., 2021; Yeboah-Assiamah et al., 2014).

These challenges highlight the urgent need for extensive research to address the pervasive issue of malpractice in developing countries. Identifying effective solutions is critical to mitigating this pressing problem and fostering trust, good governance, and economic progress.

1.2 The objective of the study

This study aims to analyse the existing literature on the role of digital technologies that can be effectively adopted to eliminate malpractices and other irregularities in the public sector of developing countries. This paper will address the following research questions.

Research Questions:

- What are the various types of malpractices and irregularities commonly found in the public sector?
- What are the key digital technologies and systems utilized to eliminate malpractices and irregularities in the public sector?
- What are the barriers and challenges to adopting digital technologies for mitigating malpractices and irregularities?
- What are the opportunities and benefits of adopting digital technologies within the public sector?
- How effective are public sector operations in implementing digital technology adoption initiatives?

This review is structured into the following sections: It begins with an introduction, outlining the purpose of the review, the research questions, and the scope of the study. The study highlights the significance of adopting digital technologies in the public sector of developing countries to combat corruption. The theoretical framework discusses key theories related to the adoption of digital technology, followed by a presentation of definitions for the key variables. The methodology section examines the research methods employed in the existing literature. It also explores the types of malpractices and irregularities prevalent in developing countries. The review further identifies key digital technologies utilized to address these issues, along with an analysis of the challenges, barriers, opportunities, and benefits of adopting such technologies. Finally, the discussion highlights gaps in the literature, proposes directions for future research, and concludes with key findings and implications.

1.3 Definitions of keywords

- **Digital Transformation:** *‘the application of technology to build new business models, processes, software and systems that result in more profitable revenue, greater competitive advantage, and greater efficiency’* (Schwertner, 2017).
- **Digital Technology:** *‘The use of digital tools, binary systems, and devices for processing, storing, and transmitting electronic data is known as digital technology. It includes a broad spectrum of technologies, such as computers, smartphones, software programs, the Internet, and cutting-edge technologies such as blockchain, machine learning, and artificial intelligence’* (Animas, 2023).
- **Public sector:** *‘Government-owned or controlled businesses and industries, as well as items related to them, are referred to as the public sector’* (Guidance, 2011).
- **Malpractice:** *‘The inability of a professional to act according to the accepted standards of the profession or to anticipate the results that a professional with the necessary training and experience should have anticipated’* (Choctaw, 2008).
- **Developing countries:** *Countries with a relatively low standard of living, an undeveloped industrial base, and a low Human Development Index (HDI). This index is a comparative*

measurement of poverty, literacy, education, and life expectancy with other countries in the world (O'Sullivan & Sheffrin, 2003).

- **Corruption:** *'The misuse or abuse of entrusted power or authorities through practices such as embezzlement, fraud, extortion, bribery/kickbacks, nepotism or favouritism, including theft of state assets and diversion of state revenue, for their gain or of others connected to them' (USAID, 2006).*

2. Methodology

A comprehensive literature review was conducted to gather relevant information from prior studies to address the research questions of this study. The search process utilized comprehensive databases, including Google Scholar and Wiley Online Library, to access peer-reviewed academic papers. Keywords such as 'digital technologies,' 'public sector,' 'e-governance,' 'malpractices,' 'corruption,' and 'fraud' were employed. Boolean operators (AND, OR, NOT) were applied to refine the searches by combining these terms effectively (Olivera, 2020).

The review focused on publications from 2014 to 2024, ensuring the inclusion of recent and relevant studies. Peer-reviewed articles indexed in reputable databases were prioritized to maintain high-quality standards. Six eligibility criteria were applied for selecting articles, including research field, topic, study design, language, sector, publication year, and publication type. Non-traditional publications, such as grey literature, were excluded to enhance the credibility of the findings. Similarly, articles published in low-ranking journals, as determined by the Scimago Journal Ranking System, were omitted.

As this study is a comprehensive literature review, data analysis methods were employed to synthesize the findings effectively. Relevant literature was collected from various academic databases and categorized thematically. The outcomes of individual studies were summarized, and similarities and differences were identified through narrative synthesis. A conceptual framework was developed to illustrate the role of digital technologies in mitigating malpractices in the public sector of developing countries. Thematic analysis was used to identify recurring themes in the literature, while comparative analysis highlighted differences and similarities in the adoption of digital technologies across various countries. The findings were then visually represented through conceptual models, tables, and charts.

Finally, significant gaps in the existing literature were identified and highlighted. Future research directions and actionable recommendations for strategic management and practitioners were proposed to address these gaps. This review is grounded in high-quality journal articles, key studies, and reports published in English by recognized international bodies and professional organizations, ensuring a robust and reliable foundation for the study's outcomes.

3. Review of the literature

The following key theories and models are relevant to the topic: *"The Role of Digital Technology Adoption in the Public Sector of Developing Countries to Mitigate Malpractices."*

Diffusion of Innovations Theory: This theory, developed through contributions from various disciplines, explains the rate at which new ideas and technologies spread. Diffusion refers to the process by which innovation is communicated among members of a social system through various channels (Rogers et al., 2014).

Technology Acceptance Model (TAM): Developed by Davis (1989), TAM examines the factors influencing individuals' acceptance or rejection of technology by understanding the drivers of their behaviour. Originating from the psychological theories of reasoned action and planned behaviour, TAM identifies perceived usefulness and perceived ease of use as the main factors influencing the adoption of digital technologies (Marangunic & Granic, 2015).

Principal-Agent Theory: This theory highlights conflicts of interest and priorities that arise when an agent acts on behalf of a principal. It is particularly relevant to governance issues in public organizations, where the interests of decision-makers (agents) may not be aligned with those of the public (principals). The adoption of digital technologies can address such conflicts and help reduce corruption in the public sector (Ramadhan et al., 2022).

Institutional Theory: Institutional theory explores how the institutional environment shapes and directs social choices. It examines the social construction of the Anthropocene and the evolution of institutions in this context. The theory also emphasizes the role of government entities in adopting innovative practices, such as implementing anti-corruption digital tools (Peters, 2022).

Together, these theories provide a robust framework for understanding the adoption of digital technologies to address malpractice in the public sector of developing countries.

3.1 Malpractices and irregularities in the public sector

Administrative corruption involves bribing employees for undue advantages and manifests in two forms: accepting bribes to provide legal services or accepting bribes to facilitate illegal services in public dealings and service delivery. It is typically perpetrated by public employees misusing their monopoly power (Mugellini et al., 2021).

The concept of political corruption, introduced by political scientists, refers to the illegal conversion of private and public sector transactions into personal benefits. This type of corruption arises from the involvement of public sector employees and is often embraced by political decision-makers. A highly politicized system fosters political or grand corruption, wherein politicians or state officials engage in corrupt practices by abusing their power. This includes making decisions that misallocate resources and adopting laws, regulations, or policies improperly (Ceva & Ferretti, 2017).

Environmental corruption entails activities that harm natural resources and the environment. Examples include polluting the ocean by dumping waste, plastic, and other hazardous materials, as well as obstructing wildlife conservation efforts. Bribes may be paid to authorities to permit illegal hunting in forests or unauthorized tree cutting. Environmental degradation, driven by inadequate enforcement of environmental laws, is a significant issue linked to corruption (Wang, 2019; Aklin et al., 2014).

Institutional corruption arises not only from a decline in public trust in government organizations due to unethical systemic and strategic influences that divert their intended purpose but also from weak institutional frameworks. For instance, it often results from low wages and significant income inequality among government employees. Another contributing factor is the inadequacy of anti-corruption measures and enforcement, coupled with a lack of transparency, accountability, and good governance within public institutions. Additionally, corruption may stem from the absence of strategies and policies designed to change the attitudes and behaviours of public employees (Thompson, 2018; Cosgrove, 2018). Moreover, corruption manifests in various forms:

Private-to-private corruption: It involves bribery, misappropriation of public resources, nepotism, or extortion by individuals or groups, is a form of white-collar crime (Jackson et al., 2019).

Budgeting corruption: It occurs when government funds are overestimated during budgeting to allow for bribes to external parties (Zhou et al., 2016).

Electoral corruption: It includes vote-buying, threatening voters at polling stations, obstructing free elections, and engaging in ballot stuffing (Chakraborty, 2024; Sidorkin & Vorobyev, 2018).

Procurement scams or procurement corruption arise during purchases or through over-invoicing of government contracts. These practices often involve discriminatory tendering processes, the absence of a legislative and regulatory framework, and various forms of fraud and corruption stemming from the bureaucratic behaviour of procurement officials. Common issues include collusion, embezzlement, bribery, fraud, misappropriation, favouritism, abuse of discretion, and nepotism. Such corruption occurs due to unnecessary needs assessments, financial waste, procurement outside of approved plans, contracting without funds, bidder manipulation, the absence of procurement documentation, lack of transparency, non-compliance with requirements, and inappropriate use of direct procurement in ordinary situations (Martini et al., 2014).

Security-related corruption involves the excessive procurement of weapons under the guise of safeguarding national security. It also includes nepotism in employee promotions, abuse of positions by officers, infiltration by religious groups, and the misuse of military intelligence to discredit opponents (Hope, 2018; Pyman, 2017). Compared to mega corruption, petty or low-level corruption is more pervasive and harmful. It has severe consequences for a nation’s economy, impeding social progress and diminishing general well-being. Finally, the ghost-worker phenomenon occurs when public authorities deliberately include fictitious names on payrolls to siphon extra salary payments (Horton, 2016).

Figure 1 presents a graphical representation of the various types of corruption prevalent in the public sector of developing countries. These include administrative, political, environmental, institutional, financial, procurement-related corruption, and the ghost-worker phenomenon. The accompanying bar chart illustrates the number of research studies on corruption conducted from 2014 to 2024. These studies were carried out in several developing countries, including Sri Lanka, India, Malaysia, African nations, the Philippines, Turkey, Indonesia, and Pakistan. The chart reveals a gradual increase in the number of articles published annually.

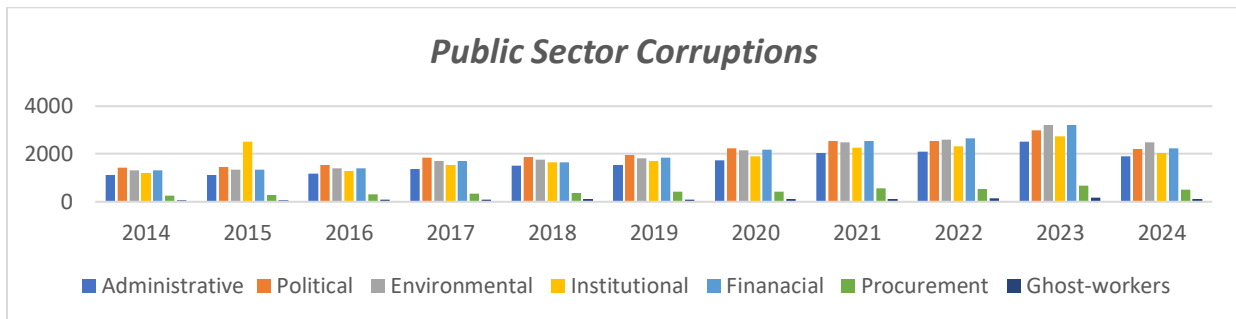


Figure 1. Number of studies on types of malpractices

3.2 Benefits and Advantages of Digital Technology Adoption.

In the past, the public sector was plagued by widespread corruption, with citizens often unable to access services without paying bribes. The adoption of digital technology in government

entities has transformed service delivery, providing efficient and effective services to citizens while enhancing transparency and accountability to reduce corruption (Luijken & Martini, 2014).

Digital transformation automates services and simplifies routine bureaucratic processes. It promotes transparency and encourages collaboration among organizations to share knowledge and best practices (Perera, 2023). Additionally, digitalization significantly enhances public administration processes by integrating and electronically connecting systems, thereby eliminating lengthy red tape. It also curtails human tendencies toward bureaucracy, misconduct, and negative behaviours, such as sabotage, while supporting broader public management reforms. Managerial processes and procedures are now effectively and efficiently maintained through electronic recording and storage (Span et al., 2022). Furthermore, blockchain technology is increasingly utilized to reduce errors and improve the effectiveness of government service delivery, fostering greater transparency and accountability (Navadkar et al., 2018). These advancements in digital services contribute significantly to increased citizen satisfaction and improved government effectiveness and efficiency (Bertot et al., 2016).

Artificial intelligence (AI) has replaced many manual tasks in the public sector through system automation. This shift enables digital auditing to significantly enhance the accuracy and efficiency of auditing processes. By granting auditors access to more precise and reliable data, digital auditing improves public expenditure management, effectively reducing malpractices, corruption, and the misuse of government funds.

E-Government initiatives further strengthen government operations by fostering efficiency and effectiveness through digitalization. They provide technical support, including high-quality online services for the public, while enhancing political and economic capabilities. Moreover, the supremacy of the rule of law is reinforced, allowing digital systems to play a pivotal role in improving public services (Elbahnasawy, 2014; Nam, 2018).

Big data analytics is among the most impactful technologies introduced in the public sector to combat malpractices. It allows large volumes of data to be analyzed promptly and effectively, enabling auditors to forecast trends, identify patterns, and detect anomalies related to fraud, corruption, or other irregularities. Additionally, semantic document search technology facilitates quick and effective retrieval of relevant information from vast document collections, streamlining auditors' workflows (Ponti et al., 2022; Adebisi & Guermat, 2022).

Furthermore, Enterprise Resource Planning (ERP) systems enhance internal processes by maintaining continuous monitoring, reducing operating costs, and improving decision-making. ERP systems also strengthen relationships with customers and suppliers, ensuring a more efficient and regulated organizational framework (Tobie et al., 2016).

3.3 Barriers and challenges of adopting digital technologies

The adoption of digital technology in public organizations to combat corruption faces significant barriers and challenges. Resistance to digital technology is prevalent among government sector employees, partly because some employees resort to malpractices due to low salaries. Digital technology could prevent such malpractices, but its implementation remains a gradual process aimed at mitigating corruption.

One such technology, whistleblowing systems, encounters specific challenges. These systems receive fewer reports due to limited public awareness and a lack of digital literacy among citizens. Barriers to adoption also stem from public ignorance about technological advancements and frequent modifications to the systems. Within public entities, additional obstacles include resistance to change, insufficient leadership support, and inadequate resources for implementation. For instance, the lack of sufficient digital infrastructure and the high costs

associated with integrating these technologies into existing systems hinder progress. Public barriers also play a critical role. Citizens face challenges such as difficulty accessing the system and concerns over data privacy. These factors further complicate the successful implementation of digital technologies in the public sector (Meiryani et al., 2023; Meitasir et al., 2022).

Artificial intelligence (AI) and machine learning (ML) have emerged as powerful tools in combating corruption within the government sector. However, introducing AI into government organizations is not a straightforward process. The adoption of AI and ML faces challenges spanning legal and regulatory, technological, ethical, and social dimensions. Key hurdles include testing AI solutions, training employees to use these technologies effectively, and establishing clear visions and plans for handling sensitive data. Additionally, challenges arise in fostering collaboration around data, encouraging experimentation, and developing policies and models to support AI implementation. Developing, maintaining, and operating AI and ML models require specialized expertise, further complicating their adoption.

Regulatory and legal barriers also pose significant challenges, including compliance with data protection laws, ensuring data privacy, managing sensitive information, and addressing liability and accountability concerns. Ethical guidelines and standards must also be meticulously considered during AI implementation to effectively mitigate corruption in the public sector (Khanijahani et al., 2022; Hall & Agarwal, 2024).

E-government is one of the most popular technologies for reducing corruption in the public sector, demonstrating significant potential to address this issue. However, despite the advantages of digital transformation in the public sector, including e-governance, its implementation has not yet achieved the desired results due to various challenges.

One major obstacle is the lack of funding to establish e-governance infrastructure, particularly in developing nations. Additionally, security and privacy breaches remain critical global concerns. The adoption of e-government also requires a workforce with advanced digital skills, and the absence of such expertise creates significant barriers. Resistance to change among employees as opposed to technological advancements further complicates the adoption process. Other barriers include insufficient leadership support, poor communication, and a lack of collaboration within organizations. Weaknesses such as deliberate mismanagement, irregularities in procurement procedures, and inadequate leadership in resource allocation have contributed to the stagnation of e-government implementation in the public sector (Hashim et al., 2020).

The implementation of big data analytics faces several challenges. Accurately summarizing vast amounts of rapidly generated, complex, and difficult-to-interpret data introduces issues such as data accessibility, legal and ethical challenges related to data sharing, and ensuring secure data storage. The adoption of big data also encounters both technical and practical barriers, including the limited availability of free data, the absence of common standards, insufficient resources, inadequate investment and funding, low levels of digital literacy, and a lack of professional skills. Moreover, addressing critical issues such as digital asset management, data access and distribution, privacy and security, as well as archiving and preservation, remains a complex task (Hardy & Maurushat, 2017; Merhi & Bregu, 2020).

3.4 Key digital technologies and systems

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Artificial intelligence (AI) and machine learning (ML) are additional digital technologies adopted to combat corruption in the public sector. These technologies possess the ability to revolutionize the development and delivery of public services. They are applied in effective decision-making, service personalization, and man-machine automation to streamline various processes. For instance, AI and ML are used to automate administrative tasks and enhance patient care in national hospitals, improving the effectiveness of frontline services. Automation reduces paperwork and other manual tasks, allowing staff to focus on more complex responsibilities. This, in turn, enhances the efficiency and productivity of public sector services.

Moreover, these technologies are instrumental in fraud detection, crime prediction, and targeted interventions by processing vast amounts of data. They enable data-driven decision-making and provide valuable insights. AI tools can also detect illegal government spending, identify fraud, and prevent errors in data management, reducing waste and ensuring efficient service delivery to the public. The public sector utilizes neural networks and data mining techniques to forecast trends in fraud detection. Neural networks, in particular, analyze data structures to create more accurate predictive models. These tools identify patterns and visualize them to support effective law enforcement and the optimal allocation of anti-corruption resources. AI serves as a powerful data processing technology that enhances the problem-solving capabilities of systems, enabling them to perform intelligent tasks. It is also an effective instrument for predicting corruption, assessing credit risk, and detecting criminal activity (Lyra et al., 2022).

Third, e-government technology plays a significant role in combating corruption within public organizations by offering more effective services to the public. This digital platform enhances accountability, transparency, and public participation while mitigating transaction costs and limiting the discretionary power of government officials. As a result, increased transparency and accountability foster good governance and strengthen democratic processes. The government service sector has traditionally operated as a monopoly. However, the introduction of e-government platforms reduces such monopolies, thereby minimizing opportunities for administrative malpractice. These platforms provide the public with convenient online access to government services while utilizing sophisticated data analysis techniques. By restricting face-to-face interactions between government employees and the public, e-government platforms further reduce opportunities for corruption. Additionally, the public sector can enhance its performance by automating services and simplifying repetitive bureaucratic processes, making service delivery more efficient and less prone to malpractices (Nguar, 2022; Basyal, 2018; Marjerison & Gatto, 2024).

Next, blockchain technology is being utilized to combat corruption in the public sector. As a distributed database, blockchain shares records or ledgers among all network users, providing a decentralized and tamper-proof ledger for public services. It enables the transformation of digital processes into blockchain applications, securely storing transactions in a decentralized and transparent manner within a peer-to-peer network.

Blockchain technology offers remarkable features such as transparency, integrity, redundancy, immutability, and privacy. These features enhance transparency and improve tracking processes. While cryptocurrencies, a blockchain application, can sometimes facilitate corruption and money laundering due to highly secure payment systems, they also offer publicly visible transactions that enable greater transparency and trust. In public governance, blockchain

fosters good governance by enhancing supply chain transparency, such as in medicine distribution, to eliminate fraud and petty corruption. Technology improves coordination within the public sector and reduces bureaucratic inefficiencies. For example, blockchain is employed in land registries to track assets, manage contracts, and verify identities, thereby eliminating corruption loopholes and enhancing accountability. Additionally, The Department of Pensions uses blockchain technology to distribute pension payments securely and transparently to pensioners (Shahariar, 2022; Cagigas, 2021; Zheng, 2017).

The Enterprise Resource Planning (ERP) system plays a vital role in helping public entities deliver services to citizens. It is a large-scale hardware and software system stored in a centralized database. This system integrates all data and operations into a single cohesive platform, accessible through a secure network. It includes complex software programs that link data and business operations across an organization's functional divisions. The ERP system facilitates access to high-quality data during fraud investigations, as data stored in the cloud is easily accessible for investigative purposes.

For example, this technology integrates auditing processes, such as evaluating the legitimacy, efficiency, economy, and effectiveness of various departments, alongside data analytics tools specifically designed for auditing purposes in public organizations. By modernizing the auditing process, ERP enhances accuracy and overall effectiveness in government operations, contributing to the reduction of corruption (Wijaya & Utomo, 2021). Another system used in government institutions to reduce corruption is the electronic procurement (e-procurement) system. Digital technologies have significant potential to transform the government procurement process. By adopting these solutions, the system enhances transparency and accountability, thus helping to combat corruption. For example, e-procurement reduces costs and helps detect corruption-related activities, particularly in the procurement of medicines. It increases transparency in the bidding process, ensuring fair competition. Management systems and e-procurement platforms are employed to streamline and tender the purchasing process (Mackey & Cuomo, 2020).

Big data analytics is a digital system adopted by public organizations to analyze large datasets, make forecasts, and identify trends that support effective decision-making. This technology also integrates public data analytics to detect irregular patterns and fosters evidence-based policymaking. It performs a variety of tasks, including data retrieval, result publication, data analysis, and data reuse. Big data analytics provides solutions to societal challenges and is particularly useful for fraud and corruption detection, as well as crime prediction. Furthermore, it helps prevent malpractice within public sector entities (Giest, 2017).

Figure 02 presents a graphical representation of digital technologies adopted in the public sector of developing countries. The bar chart illustrates a significant increase in the adoption of digital technology between 2014 and 2024. Digital technologies, including the Whistleblower System, ERP system, AI technology, e-procurement, e-government, big data, blockchain technology, and mobile technologies, have been adopted in the public sector to mitigate corruption in developing countries. These research articles demonstrate how these technologies enhance the effectiveness of the public sector and improve the delivery of services to citizens without significant difficulties.

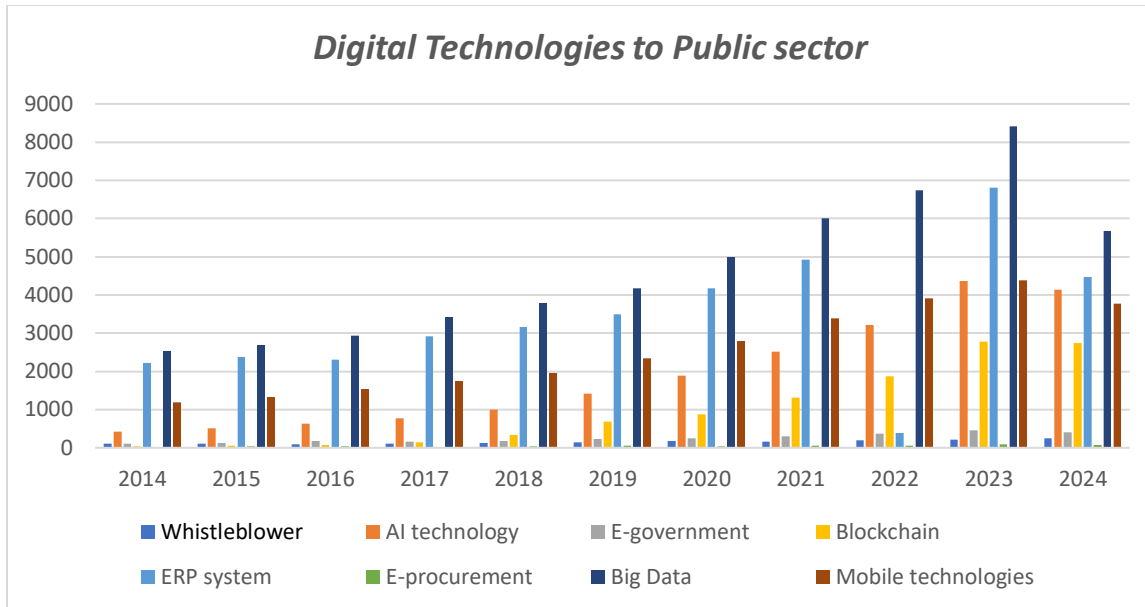


Figure 2. Number of studies on the adoption of digital technologies in the public sector to reduce corruption

3.5 Case Studies of Public Sector Digital Technology Adoption

The public procurement system presents significant opportunities for corruption due to the involvement of large government funds, bureaucratic decision-making, and incentives. The OECD estimates that the money lost through government procurement budgets is extremely high. Case studies from countries such as South Korea, Georgia, and Albania demonstrate how improvements in procurement systems can reduce corruption opportunities. These improvements include online publication of information, enhanced control over the procurement cycle, and the streamlining and standardization of procurement processes (Luijken & Martini, 2014).

By automating and integrating procurement processes in the government sector, these countries have increased efficiency, transparency, and accountability. According to CIPFA, Ghana introduced several regulations in 2020 to transition procurement transactions from cash to digital currency. The country developed a "Cash-Lite Roadmap" in collaboration with the World Bank and the UN to combat corruption and ensure transparency, accountability, and efficiency in government processes.

Additionally, the same study highlights an app created by Tanzania to regulate the sale of spirits using an electronic tax stamp system. The Tanzania Revenue Authority implemented tax stamps for various products, allowing government authorities to verify the authenticity of the electronic stamps and prevent the use of counterfeit goods. Similarly, Estonia employs cloud technology to facilitate remote work by IT specialists and enhance the country's digital infrastructure. Estonia has developed digital channels for taxation, voting, banking, and education, allowing citizens to engage with government initiatives while eliminating corruption associated with paper and cash transactions.

Singapore has implemented the GeBIZ program as part of its e-government master plan. Meanwhile, the "Not In My Country" project in Uganda is a crowdsourcing platform designed to document, report, and disseminate information about corruption within Ugandan universities. In Kenya, platforms such as IPaidABribe, Corruption Tracker, and Hatari enable individuals to anonymously report instances of bribery and other irregularities.

3.6 Summary of Key Findings on the Public Sector for the Adoption of Digital Technology

Digital technologies are adopted in the public sector to combat malpractices and other irregularities, improve performance, and deliver effective services to citizens. The adoption of technology reduces the communication gap between the government and the public, enhancing transparency, accountability, and public participation. It also minimizes information asymmetries and accelerates process automation. Furthermore, it limits the discretion of public officials and reduces red tape, ensuring that government funds are managed transparently, with no tolerance for corruption or malpractices.

Digital government platforms also foster innovation in the digital era. In addition, citizens can easily report corruption to the government using digital systems, which helps prevent corruption and other malpractices within public organizations (Perera, 2023; Nurhidayat & Kusumasari, 2018; Navadkar et al., 2018; Ponti et al., 2022). A summary of the key findings is presented in the following table.

Table 1

Digital technologies adopted in the public sector to reduce corruption. (developed by the author)

Digital technology used	Impact on Public Sector	Citations
<i>Blockchain technology</i>	<i>Enhanced transparency; Boost accountability of services</i>	<i>(Navadkar et al., 2018).</i>
<i>Artificial Intelligence</i>	<i>Improved data-driven decision making; Transformed to automated processes; Acquire data protection</i>	<i>(Butterworth, 2018; Charles, 2022)</i>
<i>E-participation, blockchain technology, and digital whistleblowing systems.</i>	<i>Increase public involvement to report malpractices</i>	<i>(Ibrahimi et al., 2022)</i>
<i>ERP, Electronic monitoring system</i>	<i>Effective monitoring and reporting of required information for decision-making</i>	<i>(Pontoh et al., 2024)</i>
<i>e-governance</i>	<i>Easy access for citizens regarding essential services</i>	<i>(Averin et al., 2021)</i>
<i>Bigdata, Blockchain technology</i>	<i>Increase speed in internal operations to deliver services to the public effectively</i>	<i>(Sarker et al., 2018; Shava, & Mhlanga, 2023)</i>
<i>Decision Support System, Artificial Intelligence, blockchain technology</i>	<i>Fraud identification could easily eliminate corruption</i>	<i>(Velasco et al., 2021; Nai, 2022; Joshi et al., 2019)</i>
<i>Artificial Intelligence, Big data, e-governance</i>	<i>Reducing bureaucracy and red tape to deliver speedy services</i>	<i>(Newman et al., 2022)</i>

The table above highlights the digital technologies used to combat various malpractices and corruption in the public sector. It provides a clear understanding and new insights into the

implementation of digital technologies to mitigate malpractices in the public sector of developing countries.

3.7 Benchmark Compressions of Developed and Developing Countries

Skare and Soriano (2021) emphasized that globalization and the adoption of digital technologies play a pivotal role in driving innovation, enhancing competition, and improving productivity. However, the rate of digital technology adoption varies across countries, reflecting disparities in the levels of globalization worldwide. Key drivers of globalization include the reduction of barriers to technology transfer, the promotion of innovation, the enhancement of competitiveness, and the improvement of productivity.

In developed countries, the adoption of digital technology has significantly transformed technology, education, business, and the global economy. However, developing countries encounter various challenges in implementing digital technologies, including issues related to government policies, infrastructure, training, and cultural differences (Ejiaku, 2014). Consequently, these nations struggle to adopt digital technologies effectively or at the same pace as their developed counterparts, hindering their ability to keep up with the global digital revolution.

The integration of digital technologies and internet access into education has created unprecedented opportunities for advancing education globally (Chan et al., 2017). Developing countries are categorized as such based on their low rankings on the Human Development Index (HDI), as defined by the United Nations Development Programme (UNDP). In these countries, the ICT sector is predominantly customer-oriented, focusing on providing digital services directly to consumers. In contrast, the growth of digitalization in developed countries is driven by socioeconomic interactions.

The ICT sector's contribution to GDP in developing countries is not expected to increase significantly. However, some nations, including China, Malaysia, India, and Serbia, have demonstrated substantial economic growth attributed to ICT development (Aleksandrova & Khabib, 2022). Additionally, internet usage is closely linked to a country's level of development. In developed countries, 93% of the population has internet access, compared to just 27% in developing countries (ITU, 2024).

3.8 Digital Technology Implementation Roadmap to mitigate corruption

- Investigate and identify the processes where malpractices occur.
- Brainstorming sessions with stakeholders.
- Establish key objectives by setting targets for the adoption of digital technologies.
- Create an implementation plan.
- Identify the appropriate digital technologies and tools to combat corruption.
- Organize the funding process.
- Develop a robust digital platform for seamless operation.
- Organize the necessary training sessions for the staff.
- Organize public awareness campaigns.
- Launch a pilot project to test reliability and validity.
- Monitor and gather feedback on the outcomes and lessons learned from the pilot study or trial.
- Implement the regulatory guidelines effectively.
- Address the ethical concerns.

- Adopt technologies for the respective processes where there are opportunities for corruption in the government sector.
- Develop a comprehensive post-implementation plan to ensure long-term system sustainability.
- Establish strategies for continuous improvement.

The outlined roadmap provides a clear, step-by-step guide for developing a digital framework to mitigate public sector malpractices. Its goal is to enhance accountability, efficiency, and transparency, ultimately benefiting both citizens and the digital economy.

4. Conclusion

Adopting emerging digital technologies has the potential to significantly reduce malpractices and irregularities in government entities within developing countries. Current issues such as a lack of transparency, accountability, access to essential information, corruption, and systemic inefficiencies can be effectively addressed through the implementation of appropriate digital technologies, creating a more efficient and effective public sector.

Even when public sector processes are well-structured, system leakages may still occur. To mitigate such issues, several digital tools can be deployed. Firstly, e-procurement systems ensure a transparent and equitable public procurement process. Secondly, digital records management systems safeguard public records, preventing employees from manipulating or destroying critical evidence. Lastly, digital auditing tools can detect and investigate irregularities within the system.

However, while adopting digital technologies is a powerful solution, it is not a standalone fix. Challenges to effective implementation include the need for strong political leadership, sufficient funding and resources, comprehensive training and education, and addressing concerns about security and privacy. Despite these obstacles, the potential benefits of integrating digital technologies in the government sector are clear.

For these technologies to achieve their full potential, they must be incorporated at the strategic level within government entities. Corporate strategies should prioritize establishing strong ethical standards and integrity, minimizing errors, and increasing awareness of the risks of malpractice. Additionally, ensuring the privacy and security of personal data is critical, as is preventing the misuse of sensitive information related to individuals and organizations. Recognizing the challenges associated with implementing electronic government systems and developing an effective, efficient e-government framework is essential for combating corruption and enhancing public sector accountability in developing countries.

5. Future Research Directions

Future research on the adoption of digital technologies to eliminate malpractices in the public sector of developing countries should focus on several key areas. Advanced digital technologies such as Artificial Intelligence (AI), Big Data, Blockchain, and Enterprise Resource Planning (ERP) systems warrant deeper exploration, particularly in addressing specific types of malpractices within government operations.

Research should investigate the adoption of these technologies in the unique context of developing countries, considering factors such as government policies, legal frameworks, cultural influences, political stability, economic conditions, vulnerabilities to corruption, and the appropriateness of various technological solutions.

Such studies would provide valuable insights for developing tailored strategies to mitigate malpractices, improve transparency, and enhance governance. By identifying the challenges and opportunities associated with adopting digital technologies, future research can contribute to the creation of more effective and efficient public sector frameworks in developing nations.

6. Implications and Recommendations

Adopting digital technologies in the public sector presents challenges such as a lack of resources, inadequate funding, and insufficient staff for infrastructure development. However, addressing these challenges is crucial for successful digital transformation. Public sector entities must allocate adequate funds to training programs aimed at enhancing employee skills and enabling staff to adapt to evolving work processes.

A comprehensive roadmap should be developed for the adoption of digital technologies in the public sector of developing countries. This roadmap should include clear objectives, timelines, and strategies, aligning with corporate-level priorities. The design and implementation of digital services must prioritize citizens' needs, experiences, and preferences. Conducting research, gathering public feedback, and analyzing public experiences are essential steps to ensure digital solutions meet the expectations and requirements of citizens effectively.

Collaborations between the public and private sectors are vital for sharing knowledge, resources, and innovation to develop and implement digital solutions efficiently. Safeguarding public information through stringent privacy policies and protocols that adhere to relevant laws and regulations is also critical. Digital transformation initiatives should be continuously monitored and evaluated, with key performance indicators and consumer feedback helping to identify areas for improvement.

Developing the digital skills of public sector employees through digital literacy programs and training initiatives is another essential step. These efforts will enable public entities to effectively implement digital technologies and establish robust digital ecosystems. Benchmarking and sharing best practices, success stories, and lessons learned from digital transformation efforts globally can help avoid duplication of efforts and foster continuous improvement.

An independent multidisciplinary audit team should be employed to conduct sudden inspections of public entities and investigate corruption through digital systems. By implementing these recommendations, the public sector can enhance productivity, overcome implementation challenges, and take full advantage of digital technologies. Ultimately, the public sector in developing countries can leverage digital solutions effectively and efficiently to deliver public services with greater transparency, accountability, and citizen satisfaction.

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