

Digitalization of Public procurement in Morocco: A Lever for Transparency and Accountability in Public Markets

Hajar NOKHAILI, (Phd Student)

Research Laboratory in Management Sciences of Organizations
ENCG
University Ibn Tofail of Kenitra, Morocco

Hamid AIT LEMQEDDEM, (Professor)

Research Laboratory in Management Sciences of Organizations
ENCG
University Ibn Tofail of Kenitra, Morocco

Correspondence address :	ENCGK University Ibn Tofail Morocco (Kenitra) Campus Universitaire, BP.242 Kenitra 14020 +212661403557 / +212537374052
Disclosure Statement :	Authors are not aware of any findings that might be perceived as affecting the objectivity of this study and they are responsible for any plagiarism in this paper.
Conflict of Interest :	The authors report no conflicts of interest.
Cite this article :	NOKHAILI, H., & AIT LEMQEDDEM, H. (2025). Digitalization of Public procurement in Morocco: A Lever for Transparency and Accountability in Public Markets. <i>International Journal of Accounting, Finance, Auditing, Management and Economics</i> , 6(2), 514-535. https://doi.org/10.5281/zenodo.14914385
License	This is an open access article under the CC BY-NC-ND license

Received: December 30, 2024 Accepted: February 21, 2025

Digitalization of Public procurement in Morocco: A Lever for Transparency and Accountability in Public Markets.

Abstract

The digitalization of public procurement is a key driver for enhancing transparency and accountability in public financial management. This paper provides a literature review and a conceptual analysis of the role of e-procurement in Morocco, highlighting its implications for governance and the efficiency of public markets. Drawing on theoretical frameworks and international experiences, the study explores the opportunities offered by digitalization, including reducing corruption, improving access to information, and optimizing procurement processes. It also identifies persistent challenges, such as technological barriers, cybersecurity risks, and institutional resistance. By examining these factors, this research contributes to the existing literature by offering a comprehensive understanding of how digital transformation is reshaping public procurement in Morocco. The findings suggest that while digitalization has significantly improved procurement practices, further efforts are needed to enhance regulatory frameworks, invest in digital infrastructure, and build technical capacities among stakeholders. This study provides valuable insights for policymakers, researchers, and practitioners seeking to maximize the impact of e-procurement on public sector governance and efficiency. Ultimately, it argues that a well-implemented digital procurement system can serve as a powerful tool for fostering integrity, transparency, and sustainable economic development in Morocco's public sector.

Keywords: Digitalization, Public procurement, Transparency, Accountability, Public Market.

Classification JEL: H83

Paper type: Theoretical Research

Résumé

La digitalisation des marchés publics est un facteur clé pour améliorer la transparence et la responsabilité dans la gestion des finances publiques. Ce document présente une revue de la littérature et une analyse conceptuelle du rôle des marchés publics électroniques au Maroc, en soulignant ses implications pour la gouvernance et l'efficacité des marchés publics. S'appuyant sur des cadres théoriques et des expériences internationales, l'étude explore les opportunités offertes par la digitalisation, notamment la réduction de la corruption, l'amélioration de l'accès à l'information et l'optimisation des processus de passation de marchés. Elle identifie également les défis persistants, tels que les barrières technologiques, les risques de cyber-sécurité et la résistance institutionnelle. En examinant ces facteurs, cette recherche contribue à la littérature existante en offrant une compréhension globale de la façon dont la transformation numérique remodèle les marchés publics au Maroc. Les résultats suggèrent que si la numérisation a considérablement amélioré les pratiques de passation des marchés, des efforts supplémentaires sont nécessaires pour améliorer les cadres réglementaires, investir dans l'infrastructure numérique et renforcer les capacités techniques des parties prenantes. Cette étude fournit des informations précieuses aux décideurs politiques, aux chercheurs et aux praticiens qui cherchent à maximiser l'impact des marchés publics électroniques sur la gouvernance et l'efficacité du secteur public. En fin de compte, elle soutient qu'un système d'approvisionnement numérique bien mis en œuvre peut servir d'outil puissant pour favoriser l'intégrité, la transparence et le développement économique durable dans le secteur public marocain.

Mots-clés : Digitalisation, Achat public, Transparence, Reddition des comptes, Marchés publics.

Classification JEL: H83

Type de l'article: Article théorique

1. Introduction

Public procurement represents one of the most significant economic activities of governments worldwide, accounting for an average of 12-15% of GDP in developed countries and up to 30% in developing economies (OECD, 2019) . It serves as a powerful instrument for economic development, market regulation, and public service delivery. However, given its complexity and the vast financial flows involved, public procurement remains highly vulnerable to corruption, inefficiencies, and opaque decision-making (Ware, G. et al., 2012). The digitalization of procurement processes—often referred to as e-procurement—has emerged as a key solution to enhance transparency, efficiency, and accountability, enabling real-time monitoring, open competition, and automated workflows (Bauhr, M. et al., 2020). In Morocco, public procurement constitutes approximately 17% of GDP and 70% of total public investment, making it a cornerstone of the country’s economic governance and fiscal policy (World Bank, 2022). Recognizing the strategic importance of procurement modernization, Morocco has undertaken significant legal and institutional reforms to digitalize its procurement system. A major milestone in this process was the launch of the National Public Procurement Portal (Portail des Marchés Publics - PMP), which aims to centralize tender announcements, facilitate electronic bidding, and provide public access to procurement data (“Ministère de l’Économie et des Finances,” 2023). This initiative aligns with international best practices and Morocco’s commitment to good governance and open government principles. The digital transformation of public procurement is expected to strengthen transparency and accountability by reducing discretionary practices, increasing competition among suppliers, and improving oversight mechanisms (Auriol, E. et al., 2016). According to (Global Corruption Report: Corruption in Public Procurement., 2023) , digital procurement platforms can significantly mitigate corruption risks by ensuring that contract awards and financial transactions are traceable and accessible to oversight bodies and the general public. Moreover, e-procurement fosters better data analytics, real-time tracking, and automated reporting, contributing to enhanced public sector performance and citizen trust (OECD, 2016). Despite these advancements, several challenges persist. Issues such as limited adoption by small and medium-sized enterprises (SMEs), interoperability constraints, cybersecurity risks, and resistance to change within public institutions hinder the full potential of procurement digitalization (Bof, F., & Previtali, P., 2010). Additionally, while digital tools improve procedural transparency, they must be accompanied by institutional capacity-building efforts and regulatory enforcement to ensure meaningful accountability (World Bank, 2021). While digital platforms offer mechanisms for real-time tracking and data analytics, concerns remain regarding their effectiveness in mitigating corruption, improving supplier access, and fostering trust among stakeholders (Bof, F., & Previtali, P., 2010). The central research question can thus be formulated as follows: **How does the digitalization of public procurement in Morocco contribute to enhancing transparency and accountability in public markets, and what challenges hinder its effective implementation?**, this study adopts a conceptual and literature-based approach to analyze the impact of digital public procurement on transparency and accountability in Morocco. By reviewing existing research and examining the theoretical underpinnings of e-procurement, this paper aims to contribute to the academic discourse on digital governance. Specifically, it explores how Morocco's procurement digitalization efforts compare to international standards and identifies key policy recommendations to enhance their effectiveness. The paper is structured as follows: The first section provides a theoretical and conceptual framework for digital public procurement. The second one presents a comprehensive literature review on the relationship between digitalization, transparency, and accountability. The third section analyzes Morocco's e-procurement system, highlighting its

strengths, challenges, and impact on governance. The last one discusses potential improvements and future perspectives before concluding with key findings and research implications.

2. Digital Public Procurement: A Theoretical and Conceptual Framework

2.1. Definitions and Key concepts

2.1.1 Public procurement

Public procurement is the acquisition by government entities of goods, services, and works from third parties, following laws and regulations designed to ensure transparency, accountability, and value for money" (Thai, K. V., 2009), it's not just a process of acquiring resources but a strategic function that influences economic performance, policy implementation, and social outcomes" (Arrowsmith, S., 2010). Public procurement represents a significant percentage of GDP in many countries, acting as both a driver of economic activity and a mechanism for governance, ensuring resources are allocated efficiently and equitably" (OECD, 2015) Also, refers to the procedures and processes by which public sector organizations purchase goods, services, and infrastructure to fulfill their objectives, governed by principles of transparency, competition, and efficiency" (Prier and McCue, 2009). Public procurement serves as a policy tool to achieve broader socioeconomic goals, including promoting sustainability, innovation, and support for small and medium-sized enterprises (SMEs) (Uyarra and Flanagan, 2010). It represents one of the most significant aspects of government activity, accounting for a substantial portion of public expenditures worldwide. It plays a vital role in delivering essential public services, driving economic growth, and fostering social development. However, traditional procurement systems often face critical challenges such as inefficiencies, excessive bureaucracy, lack of transparency, and limited accountability. These issues undermine the effectiveness of public resource allocation, reduce trust in government institutions, and create vulnerabilities to corruption. **E-procurement**, a subset of digital public procurement, refers to the use of electronic platforms and technologies to facilitate and manage procurement processes, enhancing efficiency, transparency, and accountability in public sector acquisitions (Vaidya, K. and Sajejev, A. S. M., 2006). By automating key procurement stages—such as e-tendering, e-contracting, and supplier management—e-procurement minimizes human intervention, reduces transaction costs, and mitigates corruption risks (Neupane, A. et al., 2014). The adoption of e-procurement is grounded in the principles of open government and digital governance, promoting data transparency and public access to procurement information (OECD, 2019). Studies indicate that successful e-procurement implementation requires robust legal frameworks, institutional capacity, and interoperability between digital systems to ensure seamless integration with financial management and auditing mechanisms (Davila, A. et al., 2003). Moreover, e-procurement fosters competitive bidding, enabling a broader pool of suppliers to participate, thus improving market efficiency and value for money (Hunja, R., 2003). While e-procurement systems have been widely adopted in developed economies, challenges remain in developing countries, including digital infrastructure constraints, resistance to change, and cyber security concerns (Schapper, P. R. et al., 2006). As governments increasingly prioritize digital transformation, e-procurement continues to evolve, incorporating emerging technologies such as block chain and artificial intelligence to further enhance procurement integrity and performance (Wirtz, B. et al., 2019).

2.1.2. Digitalization of public procurement

Digitalization refers to the broader integration of digital technologies into the processes, workflows, and systems of public procurement. It involves using digital tools and platforms to transform how governments acquire goods, services, and works from suppliers. The objective

is to enhance efficiency, transparency, and accountability throughout the entire procurement lifecycle. **Digitalizing public procurement** has emerged as a transformative solution to address these systemic problems. By leveraging technology, e-procurement platforms aim to streamline procurement processes, automate administrative tasks, and provide real-time access to procurement information. These systems are designed to promote transparency by making tender opportunities publicly accessible and enhancing accountability through digital audit trails. In the public sector, in particular, the influence of e-procurement is a decisive factor in achieving effectiveness. The potential benefits of digital procurement are numerous, ranging from increased efficiency and reduced operational costs to fostering greater competition and ensuring equitable access to public markets. In addition to operational improvements, digital procurement systems can significantly strengthen governance by reducing human discretion and enhancing oversight mechanisms. Transparency and accountability are critical pillars of good governance, and digitalization provides governments with tools to uphold these principles. By enabling data-driven decision-making, these systems empower policymakers to better allocate resources and monitor public spending, ultimately leading to improved outcomes for citizens. **Digitalization in public procurement** encompasses several key aspects that enhance efficiency, transparency, and accountability in government acquisitions. One critical component is data-driven decision-making, where advanced data analytics and artificial intelligence are leveraged to forecast procurement needs, evaluate supplier performance, and detect potential irregularities, thereby improving the overall procurement process. Transparency and open data initiatives further strengthen public procurement by ensuring that procurement information is published online, enabling public scrutiny and fostering fair competition among suppliers. Additionally, the integration of procurement systems with other government functions, such as budgeting, auditing, and contract management, creates interconnected systems that enhance oversight and coordination across different administrative processes. Another significant aspect is the adoption of electronic archives and records, which facilitate the digital storage of procurement documents, ensuring accessibility, compliance with audit requirements, and long-term data preservation.

The relationship between the digitalization of public procurement and e-procurement is intrinsically linked, as e-procurement serves as a fundamental pillar of digital transformation in procurement. While digitalization refers to the broader integration of digital technologies across all procurement processes, e-procurement specifically focuses on the automation of key procurement stages such as e-tendering, e-contracting, and supplier management. The digitalization of procurement enables more sophisticated e-procurement systems, allowing for real-time data analysis, increased efficiency, and enhanced regulatory compliance. Consequently, the transition to digital procurement ecosystems supports more transparent, accountable, and efficient public procurement practices.

2.1.3. Transparency

Transparency is a widely discussed concept in organizations, institutions, and among citizens, yet its precise meaning often varies depending on the context. Broadly, transparency refers to the openness and clarity with which decisions, processes, and information are communicated within and outside an organization. It is closely linked with effective communication, fostering an environment where stakeholders—whether employees, citizens, or other participants—are informed and engaged. Transparency is a fuzzy concept within the governance literature; it is commonly linked, through blurry categorizations, to other concepts in the political science and public administration scholarship, such as accountability and corruption. Transparency is a multidimensional concept (Blind, 2014) which, although inversely related to corruption, is transversal to a whole host of good governance factors (Hood, 2010). Yet, little attention has been paid to the actual elements of good governance not only effectively countering corruption

but also advancing an efficient and effective public management (Fuchs and Roller, 2018). Importantly, transparency is not solely the responsibility of leaders. It is a collective effort involving managers and employees at all levels. Each plays a role in contributing to an organizational culture that values openness, accountability, and mutual understanding. **Transparency in public procurement** refers to the accessibility and clarity of information throughout the entire procurement process, ensuring that all procedures, from tender announcements to contract awards, remain open to public scrutiny. It fosters trust in the procurement system by clearly outlining how decisions are made, who is responsible for them, and the rationale behind them (OECD, 2016). A key aspect of transparency is access to information, where details regarding calls for tenders, selection criteria, the number of bids received, the evaluation process, and the reasons for awarding contracts are publicly available (Thai, 2017). Additionally, visibility of processes plays a crucial role in ensuring fairness by making procurement procedures transparent, including access to evaluation criteria, the selection process, and justifications for contract awards (Fazekas, M. and Tóth, B., 2016). The adoption of centralized e-procurement platforms further strengthens transparency by providing a unified system where all procurement activities can be managed efficiently, facilitating oversight and accountability ("European Commission. Directorate General for Research and Innovation," 2013). Moreover, public disclosure remains a fundamental principle of transparent procurement, ensuring that details related to contracts, contractors, and financial transactions are accessible to all stakeholders (World Bank, 2006). Digital procurement systems enhance this disclosure by making critical procurement data available online, promoting integrity, reducing corruption risks, and reinforcing accountability in public sector acquisitions (Schapper, P. R. et al., 2006).

2.1.4. Accountability

Accountability refers to the obligation of individuals, organizations, or institutions to explain, justify, and take responsibility for their actions, decisions, and outcomes. It establishes a relationship of answerability between those in positions of authority and the stakeholders they serve, ensuring that power is exercised transparently, ethically, and in alignment with established rules and standards (Bovens, 2007). In public administration, accountability mechanisms enable citizens, oversight bodies, and other stakeholders to evaluate the performance and integrity of public officials and institutions. These mechanisms foster trust, deter misconduct, and promote efficiency in achieving public objectives (Melvin J. Dubnick and H. George Frederickson, 2011). Accountability is thus a cornerstone of good governance, reinforcing the legitimacy and effectiveness of public decision-making processes (World Bank, 2006). **Accountability in public procurement** ensures that public officials, contractors, and government institutions are held responsible for their actions and decisions throughout the procurement process. A system with strong accountability requires officials to justify their choices, explain their decision-making processes, and be answerable for any errors, omissions, or unethical behavior. One of the key mechanisms for enforcing accountability is robust monitoring and auditing, which ensures that procurement activities comply with legal frameworks and that public funds are allocated efficiently (World Bank, 2006). Additionally, responsibility for decisions is a cornerstone of transparent procurement, where government agencies and officials must provide justifications for selecting specific contractors, adhere to procurement criteria, and demonstrate responsible management of taxpayers' money (Schapper, P. R. et al., 2006). Institutional oversight and governance structures further reinforce accountability by implementing multiple layers of scrutiny, including external audit bodies, parliamentary committees, and civil society organizations that track procurement activities and expose irregularities (Fazekas, M. and Tóth, B., 2016). These mechanisms collectively

contribute to enhancing public trust, reducing corruption risks, and ensuring the effective use of resources in public procurement systems.

2.2. Overview of relevant theoretical models

Governance theories provide a fundamental framework for analyzing the structures, processes, and relationships that shape decision-making within organizations, including public sector institutions. When applied to public procurement, these theories offer insights into how various actors—government entities, suppliers, contractors, oversight bodies, and citizens—interact within the procurement ecosystem. The digitalization of procurement processes through e-procurement platforms fundamentally alters these interactions by introducing new mechanisms for accountability, transparency, and efficiency. This section explores key governance theories relevant to e-procurement, including principal-agent theory, transaction cost economics, institutional theory, and stakeholder theory.

Table 1: Theoretical Foundations of Digital Public Procurement – Governance, Transparency, Accountability, and Ethics

	Theory	Author	Definition	Relevance and Impact in the Context of Digitalization
*Governance Theories	Principal-Agent Theory	(Mitnick, 1975; Ross, 1973)	Principal-Agent Theory is fundamental to understanding the risks involved in public procurement. The theory highlights the inherent conflict of interest between the principal (typically the government) and the agent (the contractor or supplier), as the principal cannot fully observe the agent’s actions. This results in issues like moral hazard and adverse selection, which can undermine procurement processes.	In the context of digitalization in public procurement , the theory gains renewed relevance. Digital tools, such as e-procurement platforms, real-time monitoring systems, and audit trails, reduce the information asymmetry between the principal and agent. These systems increase transparency and allow the principal to monitor and assess the agent’s performance continuously, thus mitigating risks associated with moral hazard and adverse selection.
	New Public Management (NPM)	(Hood, 1991)	New Public Management (NPM) is a governance theory that emphasizes the importance of applying private sector management practices to public sector operations to improve efficiency and accountability. NPM encourages the use of market-based mechanisms, performance measurement, and decentralization of decision-making.	In the context of public procurement , Digitization aligns with NPM principles by fostering competition, transparency, and accountability in public procurement. Automation minimizes errors, enhances oversight, and ensures open access to opportunities, promoting fair bidding and improved control, all core aspects of New Public Management (NPM).
	Network Governance	(Rhodes, R. A. W., 1997)	Network Governance refers to the coordination of actions among multiple stakeholders in a network of interdependent actors, such as government agencies, contractors, civil society organizations, and citizens. Network governance is particularly relevant in public procurement, where various entities must collaborate to ensure the procurement process is fair, efficient, and in line with public policies.	Digitalization facilitates network governance in public procurement by providing platforms for collaboration, information exchange, and communication between stakeholders. E-procurement systems allow different entities—government bodies, auditors, contractors, and even civil society—access to procurement data, fostering greater cooperation and joint decision-making.

	Institutional Theory	(Meyer and Rowan, 1977)	Institutional Theory focuses on how institutions—formal rules, laws, norms, and practices—shape organizational behavior. In the public sector, institutional pressures can have a significant influence on procurement practices. For example, the rules governing public procurement are often influenced by national laws, international standards, and evolving societal expectations of transparency and fairness.	Digitalization can both challenge and reinforce institutional norms. On one hand, the adoption of digital procurement platforms can disrupt traditional procurement practices, encouraging more transparency, openness, and efficiency. On the other hand, it requires adapting existing institutional frameworks to incorporate new technologies and practices. This may involve updating regulations, training personnel, and overcoming resistance from traditional procurement officers or contractors who are accustomed to the status quo.
**Transparency and Accountability Theories	Theory of Transparency	(Hood and Heald, 2006)	The Theory of Transparency emphasizes the importance of clear and accessible information for fostering public trust and mitigating corruption. It argues that when information is readily available and decisions are made in an open manner, public officials are more likely to act in the public's interest. Transparency in public procurement allows stakeholders—such as citizens, oversight bodies, and contractors—to observe the procurement process, evaluate the performance of suppliers, and identify any irregularities or inefficiencies. The concept of transparency has evolved over time. Heald (2006) categorizes transparency into different types: fiscal transparency , organizational transparency , and procedural transparency	In the context of digitalization, the use of electronic procurement systems has significantly enhanced transparency. Digital platforms provide real-time access to procurement data, allow for public scrutiny of contract award decisions, and make performance data easily accessible. In countries like Morocco, where e-procurement platforms are increasingly used, transparency is improved through the availability of detailed records, bidding procedures, and contract performance data.
	Accountability Theory	(Bovens, 2007)	The Theory of Accountability suggests that individuals or organizations are accountable when they are held responsible for their actions, whether through internal or external oversight mechanisms. Bovens (2007) provides a comprehensive framework for understanding accountability in public administration, emphasizing that it encompasses both vertical accountability (where citizens or the legislature hold government officials accountable) and horizontal accountability (where different branches or agencies of government oversee each other). In public procurement, vertical accountability involves mechanisms like audits, public reviews, and judicial oversight, while horizontal accountability focuses on inter-agency oversight, checks, and balances within the government.	In digitalized public procurement systems, accountability is strengthened through the creation of comprehensive audit trails and real-time performance tracking . Digital platforms allow for continuous monitoring of procurement activities, ensuring that actions are recorded and can be reviewed later for compliance with legal and procedural standards. Additionally, e-procurement platforms promote external accountability by offering citizens and oversight bodies access to procurement data, thereby enhancing scrutiny and fostering a culture of responsibility.

***Anti-Corruption and Ethical Governance Theories	Fraud Triangle Theory	<p>(Cressey, D. R., 1953)</p> <p>The Fraud Triangle, developed by criminologist Donald Cressey, is a well-known model used to understand the factors that contribute to fraudulent behavior. The triangle consists of three key elements: Opportunity – The ability to commit fraud, typically arising when there is a lack of controls or oversight. Motivation – The pressure or incentive that drives individuals to commit fraud, often linked to personal or professional stress. Rationalization – The mental process by which individuals justify unethical behavior, allowing them to reconcile their actions with their values.</p>	<p>Digital procurement systems address fraud by minimizing opportunity through automated controls, real-time monitoring, and audit trails; reducing motivation via transparent, standardized processes that deter bribery and favoritism; and limiting rationalization by fostering accountability with automated compliance checks, whistleblower tools, and reporting mechanisms, creating a culture of ethical behavior in procurement activities.</p>
	Ethical Decision-Making Models	<p>(Rest, J. R., 1986)</p> <p>Ethical decision-making Models frameworks are essential in guiding individuals to make morally sound decisions, particularly in environments where complex ethical dilemmas may arise. One widely recognized framework for ethical decision-making is Rest’s Four-Component Model (1986), which outlines four stages of ethical decision-making: Moral Awareness, Moral Judgment Moral, Motivation and, Moral Action.</p>	<p>Digital procurement systems enhance ethical decision-making by fostering moral awareness through transparent processes, encouraging ethical judgment with automated, objective evaluation tools, and supporting ethical action via compliance checks, real-time monitoring, and whistleblower mechanisms. These systems promote integrity, reduce corruption, and embed ethical governance in every stage of public procurement.</p>

Source: The table was constructed based on data collected as part of this research

The theoretical foundations of e-procurement illustrate how governance theories help explain the transformation of public procurement through digitalization. Principal-agent theory highlights how digital tools mitigate agency problems and corruption risks, while transaction cost economics emphasizes efficiency gains. Institutional theory sheds light on the factors driving e-procurement adoption, and stakeholder theory underscores the importance of inclusive and participatory governance in procurement decision-making. Finally, digital governance principles reinforce the broader implications of e-procurement in modernizing public administration. Understanding these theoretical perspectives provides a comprehensive framework for analyzing the impact of e-procurement reforms on transparency, accountability, and efficiency in public procurement systems.

3. Analysis & Evaluation of the Moroccan Public Procurement Portal

The (PMMP) is the cornerstone of Morocco’s efforts to digitalize public procurement, aligning with international standards for transparency, efficiency, and good governance. Introduced as part of broader public sector reforms, the PMMP serves as a centralized digital platform that facilitates the management of public procurement processes, including the publication of tenders, bid submission, contract awarding, and monitoring of procurement activities. This initiative is in line with Morocco’s commitment to modernizing public administration and strengthening institutional integrity through digital governance (OECD, 2021) The platform is designed to enhance accessibility for government agencies, suppliers, and civil society actors, ensuring that procurement procedures are transparent and competitive. Developed under the supervision of Morocco’s National Commission for Public Procurement and in collaboration with international institutions such as the World Bank, the PMMP aims to address long-standing inefficiencies in public procurement. Prior to its implementation, Morocco’s procurement

system relied heavily on manual processes, which were often susceptible to delays, human error, and risks of corruption (Ben Arfi, W. and Torkhani, F., 2022). By transitioning to a digital platform, the government sought to streamline administrative processes, reduce procurement cycle times, and establish a more level playing field for businesses seeking public contracts. The PMMP follows international best practices, drawing inspiration from successful e-procurement systems implemented in countries such as Estonia, South Korea, and Brazil, where digitalization has played a pivotal role in improving governance and service delivery (Moon, M. J., 2017)

One of the defining features of the PMMP is its user-friendly interface and accessibility. The platform is publicly available online, allowing suppliers, procurement officers, and oversight bodies to track procurement activities in real time. It includes a searchable database of tenders, an automated notification system for new opportunities, and a secure electronic submission feature for bid proposals. These functionalities are designed to eliminate opacity in the procurement process and minimize the risks of favoritism or discretionary decision-making. Moreover, the electronic document management system within the PMMP facilitates the storage and retrieval of procurement-related documents, reducing paperwork and improving record-keeping practices in accordance with ISO 37001 anti-corruption standards (Transparency International, 2020). Despite these advancements, the implementation of the PMMP has faced several challenges. Digital literacy gaps, particularly among smaller enterprises and local procurement officials, have slowed the adoption of the platform. Many SMEs, especially in rural areas, lack the technical capacity to navigate the system effectively, creating barriers to full participation (OECD, 2021). Additionally, cybersecurity concerns remain a critical issue, as the digitization of procurement processes increases the risk of data breaches, fraud, and hacking attempts. Addressing these challenges requires sustained efforts in capacity building, regulatory updates, and investment in cybersecurity infrastructure to ensure that the platform operates securely and efficiently (Cerrillo-i-Martínez, A., 2018). Overall, the PMMP represents a significant step forward in Morocco's journey toward digital governance and public sector modernization. By enhancing transparency, increasing competition, and improving efficiency, the platform contributes to the broader objectives of sustainable and accountable governance. However, for its full potential to be realized, Morocco must continue to refine the platform, address adoption challenges, and integrate emerging technologies such as blockchain and artificial intelligence to further enhance procurement integrity and efficiency (Molinari, F., 2021)

3.1. Gaps in Previous Studies

Several authors have examined the gaps in research on the digitalization of public procurement in Morocco and globally. For instance, (Ghyati and Kasbaoui, 2021) analyzed digital transformation and public procurement at Hassan II University of Casablanca, highlighting the need for an integrated approach to enhance procurement functions. Similarly, (Daif, Y. and Er-Radi, R., 2021) explored the opportunities and challenges of digitalizing public procurement management, emphasizing technical and institutional barriers preventing optimal digital adoption. Additionally, (Khaddar, A. and El Intidami, M. E. B., 2019) investigated the determinants of technology and information system adoption by bidders in Moroccan public procurement, identifying significant gaps in the effective use of these technologies. These studies, among others, contribute to a better understanding of the challenges and opportunities associated with digitalizing public procurement while highlighting the need for further research to address existing gaps.

Despite the growing interest in digital procurement as a tool for enhancing transparency, efficiency, and accountability in public markets, research on the subject—particularly in the Moroccan context—remains limited and fragmented. Most existing studies on public

procurement in Morocco focus on traditional procurement methods, corruption risks, and regulatory frameworks, with little emphasis on the digital transformation of procurement processes. While international research, particularly from organizations such as the World Bank and the OECD, has extensively analyzed the impact of e-procurement on governance and economic development, few empirical studies have explored its direct effects in Morocco.

One key limitation in existing research is the lack of comprehensive data and longitudinal studies assessing the actual impact of e-procurement on corruption reduction, efficiency gains, and cost savings. Many studies discuss the theoretical advantages of digital procurement but do not provide empirical validation through statistical evidence or case studies specific to Morocco. Additionally, research often fails to address the digital divide and the disparities between large enterprises and SMEs in accessing e-procurement platforms. Studies from developed countries (e.g., Singapore and Estonia) highlight successful e-procurement systems, but these findings may not be directly applicable to Morocco due to differences in infrastructure, regulatory environments, and institutional capacity. Furthermore, while research acknowledges the potential of emerging technologies (such as artificial intelligence, blockchain, and big data analytics) in enhancing procurement processes, there is limited analysis on how these innovations could be adapted to Morocco's public procurement system. Similarly, existing literature does not sufficiently explore the role of human and institutional capacity in the effective adoption of e-procurement, nor does it provide policy recommendations tailored to Morocco's unique challenges.

Addressing these research gaps is essential for a more comprehensive understanding of the digitalization of procurement in Morocco. Future studies should adopt a more empirical, data-driven approach, leveraging case studies, performance metrics, and comparative analyses to assess the effectiveness of the (PMMP). Additionally, research should explore regulatory reforms, cybersecurity challenges, and stakeholder perceptions to provide a holistic view of the digital transformation of procurement.

3.2. Opportunities and Benefits of E-Procurement in Morocco

The digitalization of public procurement in Morocco presents a transformative opportunity to enhance transparency, efficiency, and economic growth. One of the most significant advantages is the increased transparency and accountability that digital procurement platforms, such as the (PMMP), bring to the system. By making procurement data publicly accessible, e-procurement reduces opportunities for corruption, favoritism, and opaque decision-making. Automated tracking and monitoring mechanisms ensure that procurement processes adhere to regulations, while digital records create an auditable trail that strengthens oversight by regulatory authorities and civil society organizations.

Beyond transparency, efficiency gains and cost savings constitute a major benefit of e-procurement. The automation of procurement procedures minimizes paperwork, reduces manual errors, and accelerates procurement cycles, resulting in significant time and financial savings for both government agencies and suppliers. By digitizing supplier registration and bid submission processes, Morocco can streamline access to public contracts and optimize resource allocation. Since the introduction of digital procurement, the number of registered companies on the PMMP has grown from 6,800 in 2007 to 13,000 in 2024, reflecting a **91% increase**. Similarly, the number of electronic submissions surged from **2,094 in 2017 to 120,800 in 2022**, marking a staggering **5,670% rise in just five years**. These statistics highlight the increasing reliance on e-procurement and its role in optimizing public resource allocation. The ability to leverage data analytics for procurement planning further enhances decision-making, ensuring that public funds are used effectively and efficiently. Another key advantage of e-procurement is its role in promoting competitiveness and expanding market access. Digital platforms provide small and medium-sized enterprises (SMEs) with easier access to public tenders, fostering a

more inclusive procurement system. This is particularly beneficial for businesses in rural or underserved areas that previously faced barriers to participation. Furthermore, by aligning procurement processes with international standards, Morocco strengthens its attractiveness to foreign investors and multinational suppliers, boosting international trade and investment. The competitive nature of digital procurement also incentivizes suppliers to offer innovative solutions, driving improvements in the quality and cost-effectiveness of public contracts.

In addition to economic and governance benefits, the digitalization of procurement supports policy reform and sustainability goals. Morocco's efforts to modernize its procurement system align with international frameworks promoted by the World Bank, the OECD, and UNCITRAL, reinforcing the country's credibility in global markets. The adoption of data-driven decision-making in procurement planning enhances public spending efficiency, ensuring that resources are directed toward high-impact projects. Moreover, e-procurement contributes to environmental sustainability by reducing paper-based transactions and facilitating green procurement practices, such as prioritizing suppliers with sustainable products and services. By embracing e-procurement, Morocco stands to unlock significant opportunities for improved governance, economic growth, and sustainable development. This rapid expansion is evidenced by the significant rise in registered companies, which nearly doubled from **6,800 in 2007 to 13,000 in 2024**, and the exponential increase in electronic submissions, soaring from **2,094 in 2017 to 120,800 in 2022**. These trends demonstrate Morocco's commitment to digital transformation but also highlight the need for further investment in digital literacy, cybersecurity, and infrastructure to sustain this momentum. Strengthening institutional capacity and ensuring widespread accessibility to digital procurement tools will be essential in realizing the full potential of Morocco's public procurement transformation.

The digitalization of public procurement in Morocco presents a transformative opportunity to enhance transparency, efficiency, and economic growth. One of the most significant advantages is the increased transparency and accountability that digital procurement platforms, such as the (PMMP), bring to the system. By making procurement data publicly accessible, e-procurement reduces opportunities for corruption, favoritism, and opaque decision-making. Automated tracking and monitoring mechanisms ensure that procurement processes adhere to regulations, while digital records create an auditable trail that strengthens oversight by regulatory authorities and civil society organizations.

Beyond transparency, efficiency gains and cost savings constitute a major benefit of e-procurement. The automation of procurement procedures minimizes paperwork, reduces manual errors, and accelerates procurement cycles, resulting in significant time and financial savings for both government agencies and suppliers. By digitizing supplier registration and bid submission processes, Morocco can streamline access to public contracts and optimize resource allocation. The ability to leverage data analytics for procurement planning further enhances decision-making, ensuring that public funds are used effectively and efficiently.

Another key advantage of e-procurement is its role in promoting competitiveness and expanding market access. Digital platforms provide small and medium-sized enterprises (SMEs) with easier access to public tenders, fostering a more inclusive procurement system. This is particularly beneficial for businesses in rural or underserved areas that previously faced barriers to participation. Furthermore, by aligning procurement processes with international standards, Morocco strengthens its attractiveness to foreign investors and multinational suppliers, boosting international trade and investment. The competitive nature of digital procurement also incentivizes suppliers to offer innovative solutions, driving improvements in the quality and cost-effectiveness of public contracts.

In addition to economic and governance benefits, the digitalization of procurement supports policy reform and sustainability goals. Morocco's efforts to modernize its procurement system align with international frameworks promoted by the World Bank, the OECD, and UNCITRAL,

reinforcing the country's credibility in global markets. The adoption of data-driven decision-making in procurement planning enhances public spending efficiency, ensuring that resources are directed toward high-impact projects. Moreover, e-procurement contributes to environmental sustainability by reducing paper-based transactions and facilitating green procurement practices, such as prioritizing suppliers with sustainable products and services. By embracing e-procurement, Morocco stands to unlock significant opportunities for improved governance, economic growth, and sustainable development. However, to fully capitalize on these benefits, the country must address persistent challenges such as digital literacy gaps, cybersecurity concerns, and infrastructure limitations. Strengthening institutional capacity and ensuring widespread accessibility to digital procurement tools will be essential in realizing the full potential of Morocco's public procurement transformation.

3.3. Comparative Analysis: Lessons from Global Practices

3.3.1. Key Success Factors in Global E-Procurement Systems

One of the key success factors in the global adoption of e-procurement systems is the integration of procurement workflows, which allows for the seamless connection of all stages of the procurement process—from tendering to contract management and payment processing—thereby streamlining operations and reducing redundancies. South Korea's KONEPS (Korea On-Line E-Procurement System) serves as a benchmark in this regard, as it fully automates the procurement lifecycle, ensuring consistent data flow, minimizing human errors, and enhancing user experience by providing a unified system that simplifies navigation for both businesses and government agencies. For Morocco, adopting a similarly integrated approach could significantly reduce administrative burdens, improve operational efficiencies, and create a more streamlined experience for public officials and suppliers. Another critical success factor in e-procurement is the use of data analytics for efficiency and fraud detection, as demonstrated by Brazil's ComprasNet, which leverages real-time monitoring tools to track procurement activities, detect inefficiencies, and flag potential fraudulent activities through pattern recognition and anomaly detection. By analyzing historical procurement data, ComprasNet enhances transparency, enables proactive fraud mitigation, and supports data-driven decision-making by providing public institutions with comprehensive reports and insights. Morocco could benefit greatly from incorporating similar advanced analytics tools, allowing for better oversight, improved decision-making and increased procurement integrity. Furthermore, the adoption of blockchain technology has emerged as a powerful tool for enhancing transparency and ensuring trust in e-procurement systems, with Estonia serving as a leading example in this domain. Blockchain's ability to provide immutable and transparent records of procurement transactions, including tender submissions, contracts, and payments, significantly reduces the risk of corruption and manipulation while fostering trust among public officials, suppliers, and citizens. Additionally, blockchain streamlines administrative processes by automating contract verification and payment tracking, thereby improving efficiency. For Morocco, integrating block chain into the (PMMP) could reinforce transparency, enhance security, and solidify public confidence in the platform, ensuring the integrity of public contracts as the country continues its digital transformation in procurement.

3.3.2 Structural Challenges to E-Procurement Implementation in Morocco

Despite the significant progress made in digitalizing public procurement, Morocco's e-procurement system faces structural barriers that impact its full adoption and effectiveness. One of the key challenges is the country's digital maturity, which varies across different governmental institutions. While some ministries and agencies have advanced digital capabilities, others still rely on outdated processes, creating inconsistencies in the

implementation of digital procurement tools (World Bank, 2022). The lack of interoperability between different government IT systems further complicates the integration of e-procurement across all public entities. Another critical factor is the administrative culture in Morocco, which has historically been characterized by hierarchical decision-making, bureaucratic complexity, and a preference for traditional, paper-based procedures (OECD, 2021). Digital transformation requires a shift in mindset and operational methods, which can be challenging in institutions that have been slow to embrace technological change. Resistance to change is particularly evident among procurement officers and public officials who may lack digital skills or perceive e-procurement as a threat to established workflows and discretionary decision-making (Fountain, J. E., 2001)

Furthermore, institutional resistance to change remains a significant barrier to reform. The transition to e-procurement disrupts long-standing procurement practices and requires a high degree of coordination among different stakeholders. Some officials may resist digitalization due to concerns about increased transparency, which could reduce informal networks and discretionary power in procurement decisions (Transparency International, 2020). Addressing this resistance requires not only technical training but also a broader cultural transformation within the public administration to encourage acceptance of digital tools as a means to improve governance, efficiency, and accountability.

4. Methodology

The research adopts a qualitative approach to analyze the impact of digitalization on public procurement in Morocco, focusing on transparency, accountability, and efficiency while identifying challenges that limit its effectiveness. This study relies on secondary data sources, including reports from international institutions such as the World Bank, OECD, and the United Nations, as well as official Moroccan government documents and legal texts, particularly those related to the (PMMP). Additionally, case studies from benchmark countries like Singapore and Estonia provide comparative insights into best practices. Empirical studies and peer-reviewed journal articles further support the analysis of e-procurement's role in governance. The research employs a comparative and thematic analysis, assessing Morocco's procurement system against international standards while examining key themes such as cybersecurity, institutional capacity, and regulatory frameworks. By using a qualitative methodology, this study aims to explore not just statistical correlations but also the mechanisms through which digital procurement influences governance. The triangulation of multiple data sources ensures a comprehensive perspective, strengthening the reliability of findings and contributing to the broader discourse on digital governance in developing economies.

5. Hypotheses and Results

Hypothesis 1: There is a positive and significant impact of the digitalization of public procurement on transparency.

The integration of digital tools into public procurement systems has been a major driver of transparency, as it mitigates the risk of corruption and discretionary decision-making by public officials. Digital procurement platforms create audit trails, making transactions more traceable and reducing the likelihood of fraudulent activities. According to a (World Bank, 2006), countries that have fully digitalized their procurement processes experience a 20–30% decrease in corruption-related procurement cases, as automated workflows leave less room for human intervention in the awarding of contracts.

In the Moroccan context, the (PMMP) was developed to align with international best practices and has contributed to increasing transparency in public procurement. The platform allows for open and real-time access to procurement data, reducing information asymmetry and

empowering suppliers and civil society to monitor the process. A report by (Transparency International, 2020) highlights that greater public scrutiny of procurement contracts leads to increased detection of irregularities and unethical practices. Moreover, the (World Economic Forum, 2022) reports that e-procurement systems improve competition by 15-25%, as they facilitate wider participation of suppliers, including small and medium-sized enterprises (SMEs), in the bidding process.

A comparative analysis of Ukraine's ProZorro e-procurement platform, which shares similar objectives with Morocco's PMMP, further demonstrates the effectiveness of digitalization in enhancing transparency. According to (OECD, 2022), ProZorro has led to a 12% reduction in procurement costs, primarily due to increased competition and better oversight mechanisms. By adopting similar transparency-enhancing features—such as the publication of contract modifications and performance monitoring—Morocco can further strengthen its procurement framework. However, the impact of digital procurement on transparency is not automatic and depends on complementary reforms, such as ensuring strict regulatory compliance, improving digital literacy among procurement officials, and addressing risks related to data manipulation or cyber threats.

Hypothesis 2: The implementation of e-procurement significantly enhances accountability in public procurement.

Beyond transparency, digitalization plays a critical role in reinforcing accountability mechanisms by improving oversight and ensuring compliance with procurement regulations. E-procurement systems introduce digital monitoring tools that track procurement activities in real-time, reducing the potential for procedural irregularities. According to the OECD (2022), countries with well-established e-procurement systems report a 30–40% increase in contract compliance, as digital records allow for greater scrutiny by auditing institutions and anti-corruption bodies.

Morocco's PMMP has laid the foundation for stronger accountability mechanisms by requiring procuring entities to publish procurement notices, award decisions, and contract amendments. However, achieving full accountability requires the integration of advanced monitoring technologies and enhanced enforcement mechanisms. Lessons can be drawn from Estonia and Singapore, two leading examples of e-procurement governance. Estonia's e-Procurement Register, implemented in 2013, ensures that 85% of all government procurement contracts comply with budgetary and regulatory constraints, according to the (Estonian Ministry of Finance., 2023). The system automatically flags inconsistencies, ensuring that procurement officers follow standardized procedures. Similarly, Singapore's GeBIZ platform, which serves as a central hub for all public procurement activities, has significantly increased the efficiency of audit processes and strengthened supplier accountability.

For Morocco, reinforcing accountability will require further investment in compliance monitoring tools, such as AI-driven anomaly detection systems, which have been successfully deployed in countries like South Korea and Brazil. Additionally, capacity-building programs for procurement officers are essential, as many lack the necessary expertise to fully leverage digital monitoring tools. A (World Bank, 2021) study indicates that 40% of public procurement officials in emerging economies lack sufficient training on e-procurement platforms, leading to inconsistent enforcement of procurement rules. By addressing these capacity gaps and strengthening digital accountability frameworks, Morocco can enhance trust in its public procurement system and mitigate risks of inefficiency and mismanagement.

Hypothesis 3: Existing challenges significantly limit the potential of digitalization in enhancing transparency and accountability in public procurement.

While digitalization has clear benefits, its effectiveness is often hindered by several structural and technical challenges that must be addressed to fully optimize Morocco's e-procurement system. These challenges include digital infrastructure limitations, cyber security

vulnerabilities, resistance to change among procurement officials, and unequal access to digital platforms for SMEs, particularly in rural areas.

One of the primary barriers to effective digital procurement in Morocco is the limited access to high-speed internet and digital tools, particularly among SMEs operating in less-developed regions. According to (African Development Bank., 2023) only 64% of Moroccan SMEs have access to reliable broadband internet, which restricts their ability to participate in e-procurement processes. In contrast, countries such as Estonia and South Korea have made extensive investments in digital infrastructure, ensuring that all businesses—regardless of size or location—can engage in public procurement. Without significant improvements in digital connectivity, Morocco risks excluding a large segment of potential suppliers, undermining competition and limiting the economic benefits of digital procurement.

Another major challenge is cybersecurity risks, which threaten the integrity of digital procurement data. The (International Telecommunication Union (ITU), 2022) ranked Morocco 92nd globally in cybersecurity preparedness, indicating significant vulnerabilities in its digital ecosystem. The increasing sophistication of cyber threats poses a serious risk to procurement transparency, as data breaches, hacking attempts, and digital fraud can compromise the credibility of the system. Best practices from advanced e-procurement countries suggest that implementing end-to-end encryption, real-time threat detection systems, and mandatory cybersecurity training for procurement officers can mitigate these risks. South Korea, for example, has adopted an AI-driven cybersecurity system that detects anomalies in procurement data, preventing fraudulent activities before they occur.

Resistance to change among procurement officials and suppliers is another challenge that slows down the adoption of digital procurement systems. A (World Bank, 2021) study found that nearly 30% of procurement professionals in developing countries prefer traditional, paper-based procurement methods, citing unfamiliarity with digital tools and concerns about system reliability. This challenge is particularly evident in Morocco, where administrative inertia and reluctance to adopt digital workflows remain key obstacles. Addressing this requires comprehensive digital literacy programs targeting procurement officers, government officials, and suppliers to ensure they can fully utilize the PMMP platform.

Finally, regulatory and institutional challenges must be considered. Morocco's procurement laws must continuously evolve to keep pace with technological advancements. Currently, there are gaps in the legal framework regarding the mandatory use of digital procurement tools and the enforcement of e-procurement regulations, which limits the system's full potential. Lessons from Singapore and the European Union suggest that introducing binding digital procurement mandates, coupled with regulatory penalties for non-compliance, can drive faster adoption of e-procurement systems and ensure effective implementation.

The findings of this section highlight both the transformative potential and the limitations of digital procurement in Morocco. While the PMMP platform has made significant strides in increasing transparency and accountability, persistent challenges such as digital infrastructure gaps, cybersecurity risks, and resistance to change continue to hinder its full effectiveness. Drawing on international best practices, Morocco can further strengthen its e-procurement system by investing in advanced monitoring tools, regulatory reforms, and capacity-building initiatives. By addressing these key areas, Morocco can maximize the benefits of digital procurement, ensuring that public procurement processes are not only transparent and accountable but also inclusive and efficient.

6. Solutions and Recommendations

The adoption of e-procurement in Morocco has significantly improved transparency, accountability, and efficiency in public procurement processes. However, to fully capitalize on its benefits and ensure its long-term success, targeted interventions are necessary to address

persisting challenges. One of the most pressing issues is the digital divide between urban and rural regions, which limits equitable access to e-procurement platforms, particularly for small and medium-sized enterprises (SMEs). Expanding digital infrastructure is crucial to ensuring inclusive participation in public procurement. The government must prioritize broadband expansion in underserved rural areas through strategic partnerships with private telecom providers to create affordable internet access solutions. Additionally, improving access to digital tools by facilitating the availability of affordable computing devices and procurement-related software for SMEs can further enhance participation. Public-private collaborations could play a key role in subsidizing costs and providing necessary technical support. Without these infrastructural improvements, many businesses, particularly those in remote regions, will continue to face barriers to entry, limiting competition and reducing the overall efficiency of the procurement system. By investing in digital connectivity and accessibility, Morocco can foster a more inclusive and competitive public procurement environment, ultimately reinforcing the effectiveness of its e-procurement framework. To fully harness the benefits of e-procurement in Morocco, it is essential to invest in continuous training programs for both procurement officials and suppliers. Digital literacy remains a critical factor in ensuring that public officials can efficiently manage procurement processes using digital tools while upholding transparency and governance standards. Regular and comprehensive training sessions should be implemented, particularly for officials with limited experience in digital procurement systems, covering both the technical functionalities and the broader governance implications of e-procurement. Additionally, small and medium-sized enterprises (SMEs) require targeted training to help them navigate the system effectively, ensuring their active participation in public tenders, particularly in rural or underserved areas where digital skills may be lacking. Training initiatives should not be limited to initial onboarding; instead, ongoing support mechanisms, such as refresher courses and technical assistance, should be established to help procurement professionals and suppliers stay up to date with system upgrades and evolving technological requirements. By strengthening digital literacy and providing continuous capacity-building efforts, Morocco can maximize the efficiency and inclusivity of its e-procurement framework, ultimately enhancing competition, transparency, and accountability in public procurement. As Morocco continues to integrate e-procurement into its public procurement framework, ensuring the security of sensitive data and reinforcing compliance mechanisms are critical to maintaining trust and efficiency. Cybersecurity threats, such as the breach in 2021, highlight the need for a robust security infrastructure to protect procurement data from cyberattacks. To address this, Morocco should invest in advanced cybersecurity technologies, including multi-factor authentication, encryption protocols, and firewalls, to fortify the system against potential breaches. Regular security audits and penetration testing should be conducted to identify and mitigate vulnerabilities proactively. Additionally, integrating blockchain technology into the e-procurement system could provide an added layer of security by ensuring data immutability and transparency, thereby preventing fraud and unauthorized alterations. Beyond security, it is equally crucial to develop robust monitoring mechanisms to track compliance with procurement regulations. Automated monitoring tools can help ensure that procurement deadlines are met, that suppliers adhere to eligibility criteria, and that any irregularities—such as conflicts of interest or collusion—are promptly flagged. Public engagement should also be strengthened by complementing data transparency with real-time updates and interactive feedback mechanisms, allowing citizens and civil society organizations to participate in procurement oversight. Finally, establishing a rigorous system of compliance audits focusing on both procedural and financial accountability will further reinforce transparency and trust in Morocco's e-procurement framework. By addressing cybersecurity challenges and enhancing compliance monitoring, Morocco can

solidify its progress in digital procurement while ensuring long-term efficiency, security, and public confidence in the system.

- ***Policy Recommendations: Strengthening Digital Infrastructure, Capacity Building, and Legal Frameworks***

To bridge the existing gaps and capitalize on emerging opportunities, Morocco should adopt a multi-dimensional policy approach that focuses on digital infrastructure, capacity building, and legal reforms. One of the primary challenges limiting the accessibility of the (PMMP) is unequal access to digital tools, particularly in rural areas where businesses face connectivity barriers. The Moroccan government should prioritize the expansion of broadband infrastructure, leveraging public-private partnerships (PPPs) to finance and implement projects that enhance internet access and affordability for small and medium-sized enterprises (SMEs) and procurement stakeholders (International Telecommunication Union (ITU), 2022). Additionally, adopting cloud-based procurement solutions would improve system resilience, scalability, and security, while mobile-friendly procurement applications could facilitate broader participation among businesses and procurement officers who lack advanced computing resources. However, improving digital infrastructure alone is insufficient; Morocco must also invest in capacity-building programs to ensure the effective use of the PMMP. Training initiatives should focus on technical skills, data analytics, cyber security awareness, and regulatory compliance (OECD, 2019) drawing insights from Brazil's SME-supportive procurement policies to develop targeted training modules and financial incentives for small businesses. Online learning platforms offering interactive courses, webinars, and certification programs could be established in collaboration with academic institutions and international organizations, ensuring high-quality training and long-term sustainability (World Bank, 2021). Beyond infrastructure and training, strengthening the legal and regulatory framework is crucial to ensuring the integrity and efficiency of Morocco's e-procurement system. Aligning procurement regulations with international standards, such as the OECD Recommendation on Public Procurement and the UNCITRAL Model Law on Public Procurement ((UNCITRAL), 2014), would provide a robust legal foundation for digital procurement reforms. Key regulatory improvements should include mandating the use of e-procurement for all public contracts to enhance transparency and consistency, introducing clear cybersecurity guidelines to safeguard procurement data, and integrating blockchain-based smart contracts to automate and secure procurement transactions. Additionally, anti-corruption mechanisms should be reinforced through real-time monitoring systems and whistleblower protection frameworks to mitigate fraud risks and promote accountability (Transparency International, 2020). By implementing these comprehensive reforms, Morocco can enhance the effectiveness of its digital procurement system, foster a more competitive and transparent public procurement environment, and position itself as a leader in e-procurement within the MENA region.

The digitalization of public procurement in Morocco represents a significant milestone in the country's broader efforts to modernize governance and enhance transparency. However, to fully realize the benefits of e-procurement, Morocco must address key challenges related to infrastructure, cybersecurity, SME inclusion, and regulatory frameworks. By drawing lessons from global best practices, the Moroccan government can implement targeted reforms that strengthen digital procurement governance, build institutional capacity, and foster a competitive procurement ecosystem. Through a strategic and inclusive approach, Morocco can position itself as a leader in digital public procurement in the MENA region, ensuring that its procurement system remains transparent, efficient, and resilient in the digital era.

7. Futures research directions

While Morocco has made notable progress in implementing e-procurement, continuous

research is necessary to assess its long-term impact and identify areas for further improvement. One crucial area for future research is evaluating whether digital procurement has led to measurable cost savings for the government and enhanced the efficiency of public service delivery. Understanding the financial and operational benefits of e-procurement would provide valuable insights into its overall effectiveness. Additionally, longitudinal studies could be conducted to examine the long-term effects of digital procurement reforms on the broader economy, particularly in terms of sustainable development, business competitiveness, and governance improvements over time. Another important avenue for research is the role of international cooperation in strengthening Morocco's e-procurement framework. Comparative studies within the MENA region could provide insights into best practices and highlight strategies for enhancing procurement efficiency through knowledge-sharing and policy alignment. Furthermore, future research should explore the transition from traditional e-procurement to green procurement, focusing on how digital platforms can prioritize eco-friendly suppliers, encourage sustainable product choices, and support environmental objectives. By addressing these areas, future studies can contribute to the continuous improvement of Morocco's public procurement system and its alignment with global best practices.

8. Conclusion

This study highlights the transformative potential of digitalization in Morocco's public procurement system, particularly through the implementation of the (PMMP). The analysis reveals that while the PMMP has significantly enhanced transparency, efficiency, and competition in public procurement, several gaps remain in terms of digital infrastructure, user adoption, and regulatory frameworks. Drawing on global experiences from countries such as Estonia, South Korea, and Brazil, the study underscores the importance of a comprehensive e-procurement strategy that includes technological advancements, capacity-building initiatives, and legal reforms. The research also identifies key challenges such as the digital divide, cybersecurity vulnerabilities, and resistance to change, which must be addressed to maximize the impact of digital procurement reforms in Morocco.

This study contributes to the existing literature on digital governance and e-procurement by providing a conceptual analysis of Morocco's digital transformation in public procurement. While prior studies have focused on general e-government initiatives, this research offers a focused examination of how digital procurement systems can enhance governance, accountability, and economic inclusivity. By integrating theoretical perspectives with empirical insights from global best practices, the study provides a framework for understanding the role of digital procurement in fostering good governance and sustainable public management. Furthermore, it bridges a gap in the literature by linking e-procurement to broader governance outcomes, demonstrating its potential to reduce corruption, improve service delivery, and promote fair competition in public markets.

Future research should expand on this conceptual foundation by conducting empirical studies that assess the long-term impact of e-procurement reforms in Morocco. Quantitative analyses of procurement efficiency, supplier participation, and cost savings would provide valuable insights into the effectiveness of digitalization efforts. Additionally, qualitative research, including interviews with policymakers, procurement officers, and private sector stakeholders, could offer deeper perspectives on implementation challenges and user experiences. Comparative studies examining Morocco's progress in relation to other developing economies would also be beneficial in identifying best practices and policy recommendations. Finally, research on emerging technologies such as artificial intelligence and blockchain in public

procurement could provide forward-looking insights into the next phase of digital governance in Morocco and beyond.

The adoption of e-procurement in Morocco has significantly advanced transparency, efficiency, and accountability in the public procurement process. By providing open access to procurement data, reducing opportunities for corruption, and fostering competition, the e-procurement system has laid the foundation for a more inclusive and equitable public sector. However, challenges such as digital literacy gaps, regional disparities, and cybersecurity risks still impede its full potential. To address these issues and maximize the benefits of e-procurement, Morocco must prioritize investments in digital infrastructure, expand training programs, and integrate advanced security measures. Continuous monitoring and evaluation, combined with policy reforms and capacity-building efforts, will be essential for strengthening the system and ensuring its long-term success. Moreover, future research should focus on the economic impacts, regional comparative studies, and sustainability aspects of e-procurement, including the potential for green procurement initiatives. By tackling these challenges and building on international best practices, Morocco can fully harness the transformative power of e-procurement, driving greater efficiency, fairness, and economic growth.

References

- (1). African Development Bank., 2023. Digital infrastructure and SMEs in Morocco: Challenges and opportunities.
- (2). Arrowsmith, S., 2010. The Law of Public and Utilities Procurement.
- (3). Auriol, E., Straub, S., Flochel, T., 2016. Public procurement and rent-seeking: The case of Paraguay.
- (4). Bauhr, M., Czibik, Á., Fazekas, M., 2020. Lights on the shadows of public procurement: Transparency as an antidote to corruption. *Governance*, 33(3), 495-523.
- (5). Ben Arfi, W., Torkhani, F., 2022. E-procurement adoption and its impact on public procurement performance: Evidence from developing countries.
- (6). Blind, P.K., 2014. Policy-Driven Democratization: Geometrical Perspectives on Transparency, Accountability, and Corruption. Palgrave Macmillan, New York.
- (7). Bof, F., & Previtali, P., 2010. National models of public (e)-procurement in Europe.
- (8). Bovens, M., 2007. Analysing and Assessing Accountability: A Conceptual Framework1. *Eur. Law J.* 13, 447–468. <https://doi.org/10.1111/j.1468-0386.2007.00378.x>
- (9). Cerrillo-i-Martínez, A., 2018. Digital public procurement and the risks of cybersecurity threats.
- (10). Cressey, D. R., 1953. Theft of the Nation: The Structure and Operations of Organized Crime in America. Glencoe Free Press.
- (11). Daif, Y., Er-Radi, R., 2021. Digitalization of Public Procurement Management: Opportunities and Challenges.
- (12). Davila, A., Gupta, M., Palmer, R., 2003. Moving procurement systems to the internet: The adoption and use of e-procurement technology models.
- (13). Estonian Ministry of Finance., 2023. E-Procurement Register ensures compliance in government contracts.
- (14). European Commission. Directorate General for Research and Innovation., 2013.
- (15). Fazekas, M., Tóth, B., 2016. From corruption to state capture: A new analytical framework with empirical applications from Hungary.
- (16). Fountain, J. E., 2001. Building the virtual state: Information technology and institutional change.

- (17). Fuchs, D., Roller, E., 2018. Conceptualizing and Measuring the Quality of Democracy: The Citizens' Perspective. *Polit. Gov.* 6, 22–32. <https://doi.org/10.17645/pag.v6i1.1188>
- (18). Ghyati, S., Kasbaoui, T., 2021. Transformation digitale et achat public : procédures dématérialisées, cas de l'Université Hassan II – Casablanca –. *Int. J. Financ. Account. Econ. Manag. Audit. IJFAEMA* 3, 1055–1070. <https://doi.org/10.52502/ijfaema.v3i6.191>
- (19). Global Corruption Report: Corruption in Public Procurement., 2023. Transparency International.
- (20). Hood, C., 2010. Accountability and Transparency: Siamese Twins, Matching Parts, Awkward Couple? *West Eur. Polit.* 33, 989–1009. <https://doi.org/10.1080/01402382.2010.486122>
- (21). Hood, C., 1991. A PUBLIC MANAGEMENT FOR ALL SEASONS? *Public Adm.* 69, 3–19. <https://doi.org/10.1111/j.1467-9299.1991.tb00779.x>
- (22). Hood, C., Heald, D. (Eds.), 2006. *Transparency: The Key to Better Governance?*, 1st ed. British Academy. <https://doi.org/10.5871/bacad/9780197263839.001.0001>
- (23). Hunja, R., 2003. Obstacles to public procurement reform in developing countries. In S. Arrowsmith & M. Trybus (Eds.), *Public Procurement: The Continuing Revolution* (pp. 13-22).
- (24). International Telecommunication Union (ITU), 2022. *Global cybersecurity index 2022*.
- (25). Khaddar, A., El Intidami, M. E. B., 2019. Determinants of Technology and Information System Adoption by Bidders in Moroccan Public Procurement.
- (26). Melvin J. Dubnick, H. George Frederickson, 2011. *Public Accountability: Performance Measurement, the Extended State, and the Search for Trust*.
- (27). Meyer, J.W., Rowan, B., 1977. Institutionalized Organizations: Formal Structure as Myth and Ceremony. *Am. J. Sociol.* 83, 340–363. <https://doi.org/10.1086/226550>
- (28). Ministère de l'Économie et des Finances., 2023.
- (29). Mitnick, B.M., 1975. The theory of agency: The policing “paradox” and regulatory behavior. *Public Choice* 24, 27–42. <https://doi.org/10.1007/BF01718413>
- (30). Molinari, F., 2021. Blockchain and AI in public procurement: Challenges and opportunities for integrity and efficiency.
- (31). Moon, M. J., 2017. Shifting from old public administration to new public governance: Transparency and responsiveness in the digital age.
- (32). Neupane, A., Soar, J., Vaidya, K., Yong, J., 2014. Wider adoption of e-procurement in developing countries: A case study in Nepal.
- (33). OECD, 2022. *E-Procurement System ProZorro*.
- (34). OECD, 2021. *The E-Leaders Handbook on the Governance of Digital Government*.
- (35). OECD, 2019. *Recommendation of the Council on Public Procurement*.
- (36). OECD, 2016. *The Role of Blockchain in Public Procurement: Improving Transparency and Efficiency*.
- (37). OECD, 2015. *Government at a Glance 2015, Government at a Glance*. OECD. https://doi.org/10.1787/gov_glance-2015-en
- (38). Prier, E., McCue, C.P., 2009. The implications of a muddled definition of public procurement. *J. Public Procure.* 9, 326–370. <https://doi.org/10.1108/JOPP-09-03-04-2009-B002>
- (39). Rest, J. R., 1986. *Moral Development: Advances in Research and Theory*.
- (40). Rhodes, R. A. W., 1997. *Understanding Governance: Policy Networks, Governance, Reflexivity, and Accountability*. Open University Press.
- (41). Ross, 1973. The Economic Theory of Agency: The Principal's Problem *The American Economic Review*, 63(2), 134-139.

- (42). Schapper, P. R., Veiga Malta, J. N., Gilbert, D. L., 2006. An analytical framework for the management and reform of public procurement.
- (43). Thai, K. V., 2009. International Handbook of Public Procurement.
- (44). Thai, K.V. (Ed.), 2017. International Handbook of Public Procurement, 1st ed. Routledge. <https://doi.org/10.4324/9781315092539>
- (45). Transparency International, 2020. ISO 37001 and Anti-Corruption Compliance: Practical insights and case studies. Transparency International.
- (46). (UNCITRAL), 2014. UNCITRAL Model Law on Public Procurement. United Nations.
- (47). Uyarra, E., Flanagan, K., 2010. Understanding the Innovation Impacts of Public Procurement. *Eur. Plan. Stud.* 18, 123–143. <https://doi.org/10.1080/09654310903343567>
- (48). Vaidya, K., Sajeev, A. S. M., 2006. Critical factors that influence e-procurement implementation success in the public sector.
- (49). Ware, G., T., Moss, S., Campos, J. E., & Noone, G. P., 2012. Corruption in procurement. In J. E. Campos & S. Pradhan (Eds.), *The Many Faces of Corruption: Tracking Vulnerabilities at the Sector Level* (pp. 295-334).
- (50). Wirtz, B., W., Weyerer, Geyer, C., 2019. Artificial intelligence and the public sector—Applications and challenges.
- (51). World Bank, 2021. World Bank Enhancing public procurement practices in emerging economies.
- (52). World Bank, 2006. World Bank Governance and Anti-Corruption Strategy: Helping Countries Combat Corruption.
- (53). World Economic Forum, 2022. Innovation-Friendly Procurement: Model Policy.