

Exploring the Adoption of Emerging Technologies to Enhance Public Procurement System: A Preliminary Investigation

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Abstract

Public procurement systems play a critical role in the functioning and governance of national economies, responsible for acquiring goods, services, and infrastructure that support public services and national development. However, traditional procurement methods in many countries have faced significant challenges. These challenges include inefficiencies in the procurement processes, lack of transparency, limited accountability, and difficulties in managing increasingly complex procurement demands. Traditional procurement systems are often decentralized, with individual public sector entities managing their own procurement activities. This decentralization can lead to inconsistencies in procurement practices, fragmented supply chains, and inefficiencies in resource allocation. Additionally, traditional systems may suffer from extended procurement cycles, which delay project completion and increase costs. These systems also tend to lack transparency, making it difficult to track spending and detect irregularities, which can lead to corruption or mismanagement. In response to these challenges, many countries have begun transitioning to centralized procurement systems. A centralized system consolidates procurement activities across public sector entities, aiming to standardize processes, improve efficiency, and reduce costs through economies of scale. Centralized procurement allows governments to streamline operations, negotiate better contracts, and improve oversight and accountability. Despite these benefits, the transition to centralized procurement is not without challenges. Some of the remaining issues include managing the integration of various stakeholders, ensuring compliance with new regulations, and fully optimizing the potential of centralized operations. Recent research has investigated the potential of emerging technologies to address the limitations of both traditional and centralized procurement systems. Technologies such as Blockchain, Artificial Intelligence (AI), and the Internet of Things (IoT) are being increasingly adopted in public procurement to improve transparency, efficiency, and decision-making. Blockchain offers a decentralized ledger that secures transactions, making procurement records tamper-proof and easier to track. AI is used to analyze procurement data, forecast demand, and automate processes, helping governments make more informed decisions and reduce cycle times. IoT enhances inventory management by providing real-time data, allowing governments to monitor supply chains and minimize shortages or overstocking. This research aims to provide clear descriptions of both the traditional and centralized public procurement system, offering a comprehensive understanding of their structure and challenges. It also highlights

success stories from previous research on the adoption of emerging technologies in public procurement systems globally. The study aims to investigate how emerging technologies along with ongoing digital transformation could be integrated into Public centralized procurement system to enhance its performance and procurement optimization. Potential benefits include increased transparency, reduced inefficiencies, improved supply chain security, and better decision-making capabilities. Additionally, the adoption of these technologies could help shorten procurement cycles, optimize resource allocation, and reduce costs in the long term. This preliminary investigation aims to highlight the key requirements for implementing emerging technologies public procurement system, along with addressing essential infrastructure and regulatory needs. As E-Procurement system already exists which plays essential component for a robust digital infrastructure, is crucial for supporting the integration of emerging technologies. Legal reforms may also be necessary to ensure compliance with international standards and data protection laws. Furthermore, public sector staff and stakeholders must receive training to effectively utilize these technologies. Lastly, securing the support of key stakeholders, including government agencies, suppliers, and contractors, is vital for successful adoption. This research offers a roadmap for the adoption of emerging technologies in public procurement systems supporting decision makers on procurement optimization. By examining the benefits and challenges of integrating emerging technologies into the procurement process, the study provides valuable insights into how these technologies can enhance transparency, efficiency, and supply chain security. The findings will also inform policymakers on the necessary infrastructure and regulatory reforms required to support successful implementation. Ultimately, this research aims to contribute to the modernization of public procurement systems, enabling governments to better serve their economies and citizens through improved procurement practices. It also highlights the research agenda that can be conducted to support the transition of public procurement systems into the adoption of emerging technologies in the public procurement system.

Keywords

Public Procurement System; Centralized Public Procurement; Procurement Optimization; Procurement Decision Making; Digital Transformation; E-Procurement; Emerging Technologies; Supply Chain & Logistics supply chains and minimize shortages or overstocking.