Educational Administration: Theory and Practice
2024, 30(3), 3483-3491
ISSN: 2148-2403
https://kuey.net/

Research Article

A Study On Sustainable E-Procurement Strategies In The Public Sector Organisations

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Citation: Dr. Shruti Mishra el al. , (2024). A Study On Sustainable E-Procurement Strategies In The Public Sector Organisations, , *Educational Administration: Theory and Practice*, 30(3) 3483-3491
Doi: 10.53555/kuey.v30i3.10689

ARTICLE INFO

ABSTRACT

Background: This paper investigates public sector e-procurement adoption rates, problems, and barriers connected to sustainable approaches. While e-procurement provides improved efficiency and openness, public sector companies face significant challenges preventing its complete application.
Purpose: The main goals of this study are to evaluate the degree of adoption of electronic purchasing inside public sector entities, pinpoint the main difficulties and obstacles faced by public sector organisations in the application of e-procurement systems, and offer recommendations for best practices and policy changes to improve the effectiveness and efficiency of e-purchasing processes in the public sector.
Methodology: The paper looks at public sector company issues, an assessment of current online procurement systems, and data on e-procurement system adoption rates. Based on a thorough analysis of these facts, the suggestions suggest regulatory changes to create an environment favourable for sustainable e-procurement methods.
Results: To ensure the success of e-procurement systems, the study underlines the need of investment in staff development, the application of digital technology, and the building of a culture of constant improvement. The results highlight the need of creating criteria to assess effectiveness and efficiency, therefore providing public sector organisations with practical information.
Originality: This paper offers fresh ideas by linking e-procurement to public sector sustainability goals. To accommodate developing digital technologies and increasing procurement needs, it underlines the need for standardised, user-centric e-procurement systems, improved knowledge-sharing efforts, and continuous staff development.

Keywords: E-procurement, sustainable procurement, technology adoption, workforce development, digital innovation, procurement efficiency, performance assessment.

INTRODUCTION

A key element in the modernisation of public sector procurement practices is e-procurement, which uses electronic technology to monitor the procurement process (Panayiotou, Sotiris & Tatsiopoulos, 2004). E-procurement technologies hold a great deal of promise to address the efficiency, transparency, and sustainability concerns that governments throughout the world are trying to address in their procurement procedures. An automated procurement procedure that integrates buy management and functional activities powers e-procurement. The advent of Web-based e-procurement is anticipated to improve supplier performance and order fulfilment, decrease inventory levels, cut down on administrative costs, and shorten

order fulfilment cycle times (Subramaniam, C. and Shaw, 2002; Son, JY, & Benbasat, I. 2007). The incorporation of sustainable practices into e-procurement methods is essential for fostering environmental responsibility, social equality, and economic efficiency, rendering it a significant field of study.

Indirect procurement, direct procurement, and sourcing are the three classifications and definitions of digital procurement operations (Minahan & Degan, 2001). Indirect procurement include the selection, acquisition, and administration of materials essential for the business's everyday operations. Direct procurement, commonly referred to as supply chain management, involves the acquisition of goods and the organisation of the manufacturing of final products. The sourcing model has four stages: information, negotiation, settlement, and after-sales, applicable to both direct and indirect procurement (Shunk and Kim, 2003).

Public-sector agencies must prioritise the interests of taxpayers over competitive advantage or profitability by managing budgets in compliance with statutory and administrative mandates, exercising fiscal prudence, and upholding a system of checks and balances aligned with a policy of full transparency and public scrutiny. E-procurement, as defined by Raghavan and Prabhu (2004), refers to the electronic procurement of products and services, including all processes from identifying the need for a product to the payment, along with post-payment/contract activities such as supplier development and contract management.

According to E-Stefano Ronchi et al. (2010), e-procurement technology adoption gave businesses a competitive edge by enabling them to charge higher prices and cultivate relationships with suppliers. talked about the main barrier to e-procurement adoption. Generally, barriers possess four dimensions: IT barriers encompass security issues, incompatibility, and absence of standardised technology; management barriers involve constrained resources, resistance to change, and inadequate information sharing; organisational barriers consist of cultural disparities, incompatibilities, and post-supplier relationships; and user barriers include apprehension, change, and insufficient information skills. Industries such as construction, manufacturing, and healthcare have implemented e-procurement systems.

Sustainable e-procurement in the public sector denotes the implementation of technology-based solutions that improve the procurement process while fostering enduring environmental and social advantages. It entails utilising electronic platforms to optimise procurement procedures, diminish paper waste, reduce carbon footprints, and promote equitable and transparent corporate practices. Moreover, sustainable e-procurement platforms enable public sector organisations to make decisions that consider both cost and broader societal and environmental implications.

Various sustainable public sector e-procurement strategies are assessed in this paper. This paper will look at how practices and digital technology enhance responsibility, efficiency, and sustainability of procurement. The study will highlight important issues and best practices for environmentally friendly e-procurement systems, therefore exposing the dynamic link between sustainability and technology in public procurement. Modernising public sector procurement now depends critically on digital procurement. E-procurement platforms can assist global governments in seeking to increase procurement efficiency, transparency, and sustainability as well as in their capacity. An important field of research is sustainable practices in e-procurement techniques since they support environmental responsibility, social equity, and economic efficiency.

Public sector sustainable e-procurement makes use of technology to enhance procurement while so fostering social and environmental advantages. It maximises procurement via electronic platforms, reduces paper waste, carbon footprints, and supports ethical business practices by means of these platforms. Sustainable e-procurement systems let public sector companies balance environmental effects with cost.

Methods of sustainable public sector e-procurement are investigated in this paper. This paper will look at how practices and digital technology enhance responsibility, efficiency, and sustainability of procurement. The research will highlight important issues and best practices for sustainable e-procurement systems, therefore exposing the dynamic interaction between sustainability and technology in public procurement.

OBJECTIVES

1. To identify the significant challenges and barriers public sector organizations face when implementing E-procurement systems.

2. To study the degree of adoption and implementation of e-procurement systems in public sector agencies.

3. To provide recommendations for policy changes & best practices to enhance the effectiveness & efficiency of electronic-procurements in the public sector.

ANALYSIS OF EXISTING SCHOLARSHIP

According to Vaidya, K., et al. (2006), they developed an e-procurement model that includes key success factors (CSF) that influence the implementation outcome and perspective. Croom, S., & Brandon-Jones, A. (2007) shared similar thoughts to Vaidya, K., et. al. (2006) has opined. In addition to it this paper also highlighted the adoption of internal service Quality is making the implementation process more simple and user friendly. Major Challenges in the implementation are some operational issues surrounding the implementation and rollout strategy. According to Aman, A., & Kasimin, H. (2011), the literature review is grounded in Croom and Brandon-Jone's theoretical Framework of e-procurement, major Challenges in the implementation are some

operational issues surrounding the implementation, roll-out strategy, software integration and data management. Walker, H., & Brammer, S. (2012) developed a regression model to assist procurement strategies. This article says supplier communication helps sustainable procurement's environmental, health, labour, and safety elements.

Bulut, C., & Yen, B. P. (2013) conducted a study in Hong Kong, indicating that the success of pilot program implementation mostly relies on robust political and institutional backing, as well as compliance with international system design. An empirical study by Shalle, N. I., et al. (2013) indicated that the majority of participants considered two catalysts—enhanced accessibility and ease of use—as crucial for inspiring users to adhere to the procedure. The study aimed to determine the degree to which managerial commitment obstructs the implementation of e-purchasing in Kenya's public sector. Thirumaran, Dr. J. (2015), the author examined the opportunities and challenges in Indian e-procurement. This website aims to elucidate the procurement process, encompassing its framework and characteristics.

According to Azanlerigu, J. A., & Akay, E. (2015), the adoption of e-procurement in the organisations under examination was hindered by personnel competency, a lacklustre legislative framework, a lacklustre technological infrastructure, and the security of procurement transaction data (Fapohunda, J. A., 2015). In this paper, the research's findings provided helpful information that helped the company assess the advantages and disadvantages of its in-house e-procurement system (Nawi, et. al. 2016; Nawi, et. al. 2017).

According to Mohungoo, Brown, and Kabanda (2020), the technology-organization-environment (TOE) architecture highlights important roadblocks in how e-procurement is used. Environmental factors include legal systems and how they impact small and medium-sized businesses, which influence public sector e-procurement's effectiveness. Similar to the study conducted by Adjei-Bamfo, P., et al. (2019), Solanke, B. H., and other studies also supported the idea that e-government activities not only increase the scope for evaluating market readiness but also aid in the integration of an e-procurement system. The study's conclusions have essential ramifications for improving sustainability in public sector organisations' downstream supply chain operations in emerging nations. A company's sustainability can be improved by utilising e-procurement technology, claim Singh et al. (2020) and Singh & Chan (2022). The research advocates for the use of technology-driven purchases to drive the demand for eco-friendly products and services, thereby contributing to the development of a more environmentally conscious supply chain.

The Indian government is using information technology to become a leader and an excellent knowledge society and to transition into the information era. The Tender Management System assists suppliers and buyers in cutting down on needless paperwork, lengthy wait times, and cycle times while still preserving process transparency.

DISCUSSION ON OBJECTIVES

Objective1:Major challenges and barriers faced by public sector organizations when implementing E-procurement systems.

a) Technology: Businesses who have invested heavily in new technology to improve operational efficiency and coordination and acquire a competitive edge have grown, according to many. E-procurement, which requires technology infrastructure, is necessary for public procurement integration. This study examines how government departments' technology infrastructure affects e-procurement. However, understanding how technological infrastructure tiers are combined to enable e-procurement requires suppliers' different infrastructure development phases. If the government understood supplier and public procurement institution infrastructure levels, they could estimate the cost of software and hardware to adopt e-procurement.

b) Employee Competence: In the year 2000, World Bank study found a high correlation between employees' ICT proficiency and the public sector's adoption of e-procurement. since the majority of workers only have basic ICT abilities, which are insufficient to support e-procurement. The majority of workers see e-procurement as a threat to their jobs, and they think that relying too much on traditional forms and methods of procurement has led to a shortage of competent staff and e-procurement knowledge, which has caused problems for many contracting organisations. Training employees on procurement procedures and e-procurement tool usage is essential to the success of an e-procurement project since it incorporates new technology and modifications to conventional procurement methods (World Bank, 2003).

c) Managerial Commitment: The assertion that managers oppose the adoption of e-procurement and do not support initiatives meant to improve e-procurement. Additionally, they believed that Top Management lacked commitment to the use of e-procurement and lacked methods to manage change brought about by it. There are no e-procurement training programmes available to its staff. The application of management expertise to enhance inventory control in South African businesses revealed that management dedication was the cornerstone of nearly all businesses, defining their expansion, survival, and success. Regretfully, not every business possesses the right kind of managerial commitment.

d) Regulation of Public Procurement: Government rules restrict the amount of technology that may be used, and government technology policies do not fully encourage the use of e-procurement. The legal framework serves as the foundation for all business transactions, whether they take place in the public or private sectors. It outlines the obligations and liabilities of the parties involved in a business transaction with

the goal of achieving mutually beneficial results. due to the immaturity of B2B legislation, which also apply to e-procurement.

e) Procurement Security Transaction Data: Electronic procurement was regarded as impeded by security and confidentiality concerns related to electronically traded data. Buyers perceived transaction risks related to acquiring inappropriate products due to faulty or misleading information in electronic contracting. Additional hazards were security vulnerabilities due to unauthorised access to trading platforms and inadequacies in safeguarding transaction-related data during transmission or storage, as well as privacy concerns stemming from incorrect information collecting and lack of transparency. Confidentiality helps companies avoid competition and stay competitive. However, public sector organisations can only share certain information with other parties. Web technology has raised data security problems in online transactions due to cybercrimes.

Objective 2: E-procurement systems have been adopted and Implemented in Public Sector Organizations.

Elaborating on the significance of supplier communication in sustainable procurement within public sector entities, particularly regarding e-procurement systems, necessitates a thorough examination of the extensive literature and diverse viewpoints on the influence of communication strategies on environmental, health, labour, and safety dimensions. Walker and Brammer (2012) emphasise that supplier interaction improves sustainable procurement practices, illustrating that good communication channels facilitate the alignment of procurement strategies with organisational sustainability objectives. This connection is essential for public sector organisations, which have distinct challenges and obligations in advancing sustainability due to their commitment to the public interest.

a) Supplier Engagement and Sustainable Sourcing

According to Walker and Brammer (2012), proactive supplier communication influences safety regulations, labour standards, environmental preservation, and health policies. Public sector companies who clearly and orderly interact with suppliers are more likely to follow environmental policies. According to their regression model, organised supplier interaction strategies increase sustainability and encourage responsible procurement all throughout supply chains.

Transparency promoted by supplier communication helps find and solve sustainability problems. By helping suppliers with limited capability fulfil sustainability criteria, focused assistance guarantees social and environmental compliance. Good communication allows one to find non-compliance problems including environmental harm or inadequate working conditions that could go unnoticed otherwise. Essential for complicated sustainability concerns, open communication with suppliers about expectations and compliance needs enhances standards and cooperative problem-solving.

b) Environmental Regulations and Communication

Good supplier communication allows one to include environmental criteria into purchase. Engaging suppliers helps public sector organisations to enhance environmental stewardship and lower environmental impact. Through well defined emissions, waste, and energy use, communication frameworks enable companies to link purchase with environmental goals. Walker and Brammer (2012) underline that regular supplier communication helps educate suppliers about the environmental goals of the company, therefore increasing their support.

Those who know environmental performance criteria are more likely to cut waste and apply energy wisely. This communication-focused method can improve public sector procurement's environmental impacts, which, as further research (e.g., Mohanty & Prakash, 2014) shows, benefits both the organisation and society.

c) Health and Safety Regulations in Supplier Partnerships

Maintaining supply chain health and safety requires good supplier communication. Third-party vendors provide vital services and products to public sector organisations, thus they must be safe and healthy. Direct supplier interaction around health and safety targets, according to Walker and Brammer (2012), helps companies track compliance and raise workplace standards.

In sectors including food, building, and healthcare, which centre public health, this is especially important. Health and safety-conscious companies, according to Carter and Jennings (2004), give staff well-being top priority, help to reduce risks, and create a safer workplace. Good communication clarifies expectations and helps suppliers follow safety procedures.

d) Labour Standards and Supplier Engagement

Effective channels of communication between public sector agencies and their suppliers ensure adherence to moral work ethics. According to a study by Walker and Brammer (2012), public sector companies that successfully communicate their labour standards highlight the need for fair compensation, appropriate working conditions, and respect for workers' rights. This respect of moral employment standards helps to prevent exploitation and enhances supplier accountability.

Supplier involvement allows companies to solve issues such as child labour, forced labour, and too-long working hours that often surface in worldwide supply chains. Other research, notably that by Hoejmose et al. (2013), confirm Walker and Brammer's conclusions by showing that supplier involvement supports more ethical labour practices, especially in sectors where labour exploitation risks are high.

Explaining the importance of supplier communication in sustainable procurement within public sector entities, especially with reference to e-procurement systems, calls for a careful reading of the large body of research and many points of view about the impact of communication strategies on environmental, health, labour, and safety aspects. Walker and Brammer (2012) underline how supplier engagement enhances sustainable procurement practices and show how effective channels of communication help procurement strategies to line up with corporate sustainability goals. Public sector companies, whose dedication to the public interest drives different challenges and responsibilities in promoting sustainability, depend on this link.

e) Adoption Rates

This paper investigates, broken down by function, size, and type, the rates of e-procurement adoption in several public sector entities. It also looks at their particular degree of adoption, including whether they are still in early stages like pilot testing or have completely integrated e-procurement into their daily operations. This method offers a thorough awareness of the integration and frequency of e-procurement technologies in governmental departments.

f) Implementation Success Factors and Challenges

The research looks at the main challenges companies run across implementing e-procurement. These cover possible knowledge gaps, worker competency levels, technological readiness—including access to basic digital infrastructure—and technical readiness. Furthermore, especially in smaller public companies, budgetary restrictions can significantly influence e-procurement activities. Complications in regulations could either delay or prevent acceptance. The study points to factors that assist effective deployment including focused staff training, strong executive backing, and flexible policy frameworks that let technology evolve.

g) Affecting Transparency and Efficiency

By means of analysis of improvements in processing speed, cost-effectiveness, and workflow management, this study assesses the influence of e-procurement on procurement effectiveness. It also considers the benefits of openness, which include lessening of corruption, more responsibility, and easier control of procurement operations. These consequences are essential for understanding how e-procurement promotes trust in government and helps public sector goals to be fulfilled.

h) Comparative Study over Sectors and Areas

The paper compares e-procurement usage across several regions and industries as well as among several governmental levels—local, regional, and national. This study aims to identify trends in adoption rates, challenges, and success elements to expose best practices that could be relevant anywhere or in any industry.

h) Data-Driven Insights:

To clarify the frequency of online procurement use and its supposed benefits, the research compiles qualitative and quantitative data including surveys, interviews, and case studies from several public sector companies. This data-driven methodology makes it possible to investigate public sector digital procurement perception and utilisation holistically.

Adoption and implementation of e-procurement systems in public sector companies all around have lately shown great advancement. This change is driven by growing knowledge of e-procurement's benefits in terms of procurement efficiency, openness, and corruption avoidance. To maximise purchases and cut expenses, many governments—especially those in Europe, North America, Asia, and Asia—have set up sizable e-procurement systems. Industrialised nations integrate faster due to better digital infrastructure and governance. In contrast, many poor countries struggle with digital infrastructure, trained workers, and adaptability. Political will, regulatory frameworks, and procurement authority training affect e-procurement deployment. The COVID-19 epidemic has accelerated e-procurement as companies seek remote and effective ways to maintain procurement operations during lockdowns and supply chain disruptions. Integrating sustainable procurement criteria using e-procurement systems to monitor and prioritise green vendors is growing. The global public sector is deploying e-procurement, but infrastructure, staff training, and policy frameworks are needed to optimise the systems.

METHODOLOGY

Research Design:

Utilise qualitative research to obtain an in-depth understanding of adoption rates, challenges, and policy requirements in sustainable e-procurement.

Data Acquisition:

Secondary Data: Examine scholarly journals, governmental publications, case studies, and industry reports pertinent to sustainable procurement, digital innovation, and e-procurement systems.

Limitations:

- Recognise any constraints in scope, like geographical limitations or restricted access to particular organisations, that may influence the study's generalisability.
- The study may encompass papers, articles, and journals; nevertheless, it has not been addressed in all journals.

CONCLUSION

An important turning point in the management of the public sector is the incorporation of sustainable practices into e-procurement systems. This study explored the difficulties and obstacles that public sector organizations confront, looked at the present level of e-procurement system adoption, and made recommendations for best practices and regulatory changes to support long-term approaches in this area.

The challenges discovered in the process draw attention to how challenging it is to change from traditional to computerised procurement methods. Employee resistance to change is one main challenge that develops and emphasises the requirement of thorough training programs. Public sector companies must make efforts in enhancing the digital skills of their staff if they are to enable a smooth transition and fully use the benefits given by e-procurement technologies.

Another major challenge is the dearth of qualified individuals able to effectively run and apply e-procurement technologies. Considering this, policy changes should concentrate on giving incentives for acquiring relevant skills, either by means of targeted hiring or ongoing training courses. Not only is a qualified workforce required for the first implementation of e-procurement systems, but also for their continuous improvement and adaptation to evolving technological surroundings.

As companies shift towards digital procurement, data security issues are starting to show more frequency. Protection of private procurement data from unauthorised access and security breaches calls for advanced security protocols. Governments and public sector companies should create tight rules and policies to ensure the integrity and security of data in e-procurement systems. To stay ahead of developing dangers, this entails routine audits, upgrades, and consultation with cybersecurity experts.

One technological difficulty needing strategic answers is integration with older systems. Governments have to give incentives for the development of interoperable systems and encourage vendor cooperation if they are to hasten the integration process. Standardising protocols helps to enable the seamless flow of data across several e-procurement systems, therefore promoting a more cohesive and efficient public procurement network.

The poll showed that public sector companies have embraced e-procurement technologies in several different ways. While some have just begun the early steps, others have effectively implemented these surgeries. Among the several factors influencing adoption are organisational culture, financial constraints, and leadership commitment.

Suggestions presented in this paper support a dynamic and all-encompassing approach to sustainable e-procurement. Crucially are comprehensive training courses including the organisational and cultural changes required as well as the technological elements of e-procurement. Although interoperability systems and standardised procedures help to create a more linked and efficient public procurement scene, early adopters' incentives help to promote proactive involvement.

E-procurement systems must remain successful over time, hence continuous monitoring and evaluation of processes is absolutely necessary. Governments and companies have to promise ongoing assessments, identification of areas for improvement, and change of strategy to handle fresh challenges.

Finally, the studies on public sector sustainable e-procurement policies highlight the multifarious nature of this innovative undertaking. By overcoming challenges, building a trained workforce, implementing robust security measures, promoting interoperability, and changing policies to match various organisational circumstances, public sector organisations may guide towards a sustainable and effective e-procurement future. Governments and companies should use the suggestions as a road map to reach sustainability, openness, and efficiency even as they try to fully exploit e-procurement.

Recommendations:

Here, the suggestions are grounded on the above-specified goals. Suggestions for legislative adjustments and best practices to improve public sector e-procurement efficiency and effectiveness.

1. Members must promote performance enhancements by assessing the efficacy of the public purchase system across all governmental tiers, from individual acquisitions to the overall framework.

a) Regularly and consistently evaluate the procurement process outcomes.

b) To structure new needs assessments, government purchasing systems should gather consistent, current, and trustworthy information. Data from previous procurements, especially about price and total costs, can be a valuable source of insight and could influence future procurement decisions

c) Create metrics to assess the efficiency, effectiveness, and savings of the public procurement system to support the development of strategic policies and serve as a benchmark.

2. Members cultivate staff in procurement capable of consistently providing value for money effectively and efficiently.

a)Guarantee that procurement authorities maintain elevated professional standards in knowledge, practical execution, and integrity by offering a specialised and regularly updated array of resources, including sufficient staffing in both quantity and capability, recognising public procurement as a distinct profession, providing certification and periodic workshops, instituting ethical standards for government contracting officials, and

establishing a unit or team dedicated to analysing public procurement data and assessing the effectiveness of the public procurement system.

b) Provide procurement staff with competitive, attractive, and merit-based career opportunities by establishing transparent advancement pathways, protecting them from political interference in the procurement process, and advocating for national and international best practices in career development to enhance the quality of the procurement workforce.

c) Encourage cooperative methods with knowledge hubs like policy centres, think tanks, and universities to enhance the abilities and proficiencies of the workforce in procurement. To enhance the incorporation of innovation to government procurement processes, knowledge centers' pedagogical experience and skills can be leveraged to extend procurement knowledge and maintain a bidirectional connection between theory and practice.

3. Improving the public purchasing framework by leveraging digital technologies to promote effective digital procurement innovation throughout the procurement cycle.

a) Make use of the latest developments in digital technology to offer comprehensive e-procurement solutions that cover the whole cycle of public procurement. Telecommunications and information technology must be utilized in government procurement to guarantee openness and accessibility to public tenders, boost competition, streamline contract award and management procedures, reduce costs, and integrate data from public finance and public procurement.

b) Look for innovative, reversible, flexible, extendable, and dependable e-procurement solutions that provide the necessary features and functions to promote organisational innovation while guaranteeing business continuity, privacy, and integrity, treating everyone equally, and protecting sensitive data. E-procurement tools must to be easy to use, suitable for their intended use, and, to the greatest extent feasible, uniform among procurement agencies. Overly complex systems run the risk of creating implementation risks and difficulties for small and medium-sized businesses or new entrants.

Prospective Outlook:

The future of successful e-procurement in the public sector depends on the incorporation of digital technologies, ongoing assessment, and proficient human capital. Further study is required to create standardised e-procurement systems that can be adapted to different levels and sectors of government. Future initiatives may concentrate on enhancing the metrics for assessing procurement processes to guarantee ongoing progress, integrating performance data for informed decision-making, and creating frameworks for benchmarking the efficiency and effectiveness of procurement systems.

Enhancing knowledge-sharing activities between procurement agencies and other organisations, including universities and think tanks, will foster innovation in the public procurement process. Creating more sophisticated, user-centric e-procurement platforms that emphasise security, transparency, and accessibility will foster competition, diminish obstacles for small enterprises, and increase data integration across governmental sectors. Ultimately, regulatory reforms and ongoing workforce development will be essential for adapting to advancing digital tools, ensuring that procurement professionals are adequately prepared to manage the growing complexity and demands of the public sector.

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