

The Relationship Between E-Procurement and Public Procurement Performance: The Moderating Effect of Employees' Attitude in the Health Sector of Ghana.

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Abstract

Employee attitude is usually cited as a key predictor of public procurement performance. However, current research has failed to provide an exhaustive explanation for the relationship between employee attitude and electronic procurement. The study sought to investigate the influence of electronic procurement on public procurement performance, with a focus on the moderating effects of employee attitudes.

The study used primary data from 130 target respondents using a well-structured questionnaire designed to meet the specific objectives. The survey instrument used a 5-point Likert scale to obtain feedback. The main analytical tools used were descriptive statistics, mean score ranking, confirmatory factor analysis, regression, and correlation analysis.

The findings revealed that the survey had achieved a very high level of reliability for employee attitude on commitment, job satisfaction, and performance. Hence, the findings significantly address the problem statement and outline the vision and potential for future studies. The Rotated Component Matrix showed the correlations between items and factors after Varimax rotation.

Factor 1 contained 8 items, Factor 2 contained 7 items, while Factor 3 contained 5 items. Respondents agreed that there was a positive relationship between employee attitude and e-procurement. The current study presents evidence of the influence of employee attitude on e-procurement performance. This will add depth to discussions and help public institutions improve e-procurement adoption by considering employee attitudes.

Keywords: Procurement Relationship, E-Procurement, Public Procurement Performance, Employees' Attitude, Health Sector Procurement

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1.0 INTRODUCTION

Managing the acquisition of goods, infrastructure, and consultancy services within a country requires effective oversight of public-sector procurement processes (Osei-Tutu, 2016). Over the years, both scholars and practitioners have come to appreciate procurement's strategic relevance (Ruparathna & Hewage, 2015). Procurement broadly involves obtaining goods, services, and works (Tetteh, 2014), and it includes identifying needs, sourcing vendors, and

managing contracts post-award. The process must uphold principles of quality, fairness, efficiency, and transparency throughout its lifecycle (Tetteh, 2014).

The rapid development of information and communication technologies (ICT) and their affordability have significantly reshaped the operations of organisations, pushing both private and public institutions to reconsider their operational strategies (Ali & Alrayes, 2014; Abdul-Azeez et al., 2015). One of the pivotal innovations from this transformation is electronic procurement (e-procurement), which has gained substantial traction globally (Smart, 2010; Ibem & Laryea, 2015). E-procurement—emerging from early digital systems such as Electronic Data Interchange in the 1960s to widespread internet usage in the 1990s—offers various benefits, including cost and time savings (Mose et al., 2013).

Tendering, a crucial phase of procurement involving the selection of suitable vendors or contractors under agreed conditions, has traditionally relied on paper-based processes, which are often costly, slow, and prone to errors (Vee & Skitmore, 2003; Hackett et al., 2007; Eadie et al., 2012; Abdul-Azeez et al., 2015). The introduction of electronic tendering—part of e-procurement—has addressed many of these issues by offering a safer, more efficient, and more environmentally friendly alternative, as noted by the Royal Institution of Chartered Surveyors (2010).

Smith (2009) highlights that e-procurement brings advantages such as greater transparency, cost efficiency, extended reach, and reduced transaction time. Furthermore, strategic use of digital tendering systems supports long-term sustainability in procurement (Oyegoke et al., 2009). E-procurement encompasses all the ICT-driven activities related to purchasing goods and services. When properly implemented, it can significantly modernise procurement systems (Mose et al., 2013; Abdul-Azeez et al., 2015) by using internet-based platforms to streamline purchasing activities (Eadie et al., 2010; Calipinar & Soysal, 2012).

Effective e-procurement platforms must foster secure, seamless interactions between buyers and suppliers, enabling organisations to enhance efficiency and profitability (Altayyar & Beaumont-Kerridge, 2016). However, employees' perceptions of e-procurement greatly influence its success in the public sector. Employees' acceptance is crucial for the optimal performance of e-procurement systems (Rahim, 2008).

2.0 LITERATURE REVIEW

This chapter critically examines the scholarly literature relevant to the research inquiry. The literature review is divided into four principal sections. First, it presents a conceptual examination of e-procurement, clarifying its definition, tracing its historical evolution, and discussing contemporary interpretations alongside fundamental principles. Key theoretical frameworks, including institutional theory, the theory of the spread of innovations, the Model for Accepting Technology, and transaction cost theory, are thoroughly evaluated.

The second segment assesses prior research on e-procurement adoption in public-sector entities, focusing on its practical application in government institutions. The third section investigates how e-procurement influences efficiency in public procurement processes, with particular attention to the moderating effect of employee perceptions. Finally, the chapter concludes by proposing a conceptual model to guide the current research.

2.2 Conceptual Review

This section defines key concepts related to public procurement and e-procurement and identifies essential components relevant to this study. Scholars have identified e-procurement as an innovation (Zou & Seo, 2006; Laryea & Ibem, 2014). The integration of information technology (IT) into procurement activities is commonly referred to as e-procurement (Gunasekaran & Ngai, 2008; Abu-Elsamen et al., 2010). The term “e-procurement application” denotes the use of IT in procurement processes (Suleman, 2013). The prefix “e” generally signifies a relationship with information and communication technology (ICT) and internet-based processes. In procurement, e-procurement utilises ICT tools to facilitate various stages, including product or service searches, sourcing, negotiation, ordering, receiving, and post-purchase evaluation (Croom et al., 2004). Today, e-procurement is among the most widely adopted

technologies in procurement, benefiting organisations by enhancing operational efficiency. Government agencies, as significant buyers of goods and services, have also recognised these advantages (Yusof, 2010).

E-procurement integrates activities such as negotiation, ordering, and post-purchase assessments into an electronic system (Croom & Brandon-Jones, 2007). Morris et al. (2000) describe e-procurement as an internet-based system designed to streamline and automate procurement from request to payment. While e-procurement is not a new concept, businesses have long attempted to develop automated procurement technologies through electronic workflow systems and electronic data interchange (EDI) (Gunasekaran & Ngai, 2008). Traditional procurement methods largely relied on telephone and other manual communication channels, demonstrating the advancements brought by e-procurement (Hawking et al., 2004). Various scholars have defined E-procurement systems in several ways, as shown in Table 2.1.

Table 2.1: Conceptual Definitions of E-Procurement

Definition	
	Electronic facilitation of company relationships and processes with suppliers.
Wijaya (2022)	Author & Year
Sun et al. (2012).	Hasmukhbhai (2022)
David (2009)	E-procurement encompasses all purchasing activities conducted via electronic means, including web-based technologies and e-commerce.
Wu et al. (2007)	The application of IT (Information Technology) to streamline and enhance the procurement of goods and services between businesses (B2B).
Tatsis et al. (2006)	E-procurement automates, integrates, and optimises procurement processes using electronic tools and web-based applications.

The conventional procurement process involves defining demand, sourcing, soliciting, evaluating, contracting, and managing contracts. However, the digital age has introduced various e-procurement methods, including e-sourcing, e-tendering, e-reverse auctions, online ordering and internet-based enterprise resource management." (ERP) (May 2021).

2.2.1 E-Sourcing

E-sourcing refers to identifying potential suppliers via the internet or specialised marketplaces instead of traditional approaches (Suleman, 2013). It expands supplier options, increases competition, and enhances bidding opportunities (Paulo, 2009). The United Nations Procurement Practitioner's Handbook recognises e-sourcing as a crucial tool in procurement, aiding in vendor assessment. Digital platforms enable suppliers to be identified, while the procurement process encompasses multiple stages. (Damavandi, 2011) , including market analysis, competitive bidding, advertising, assessment, contractual agreement negotiation, contract allocation, and post-award management. (MoD e-procurement Strategy and Plan, 2008-2012).

2.2.2 E-Tendering

E-tendering is increasingly common in the construction industry and is a component of e-procurement (Ibem & Laryea, 2017). It involves creating and submitting tenders electronically (Akintola, 2011; Oyediran, 2011). E-tendering encompasses the digital announcement of tenders and online submission of bids (Ibem & Laryea, 2015; Costa & Grilo, 2015). Various scholars

define e-tendering as a tool for communication between procurement entities and vendors, including analysis and evaluation phases (Tindsley & Stephenson, 2008; Lou & Ashalwi, 2009; Chilipunde, 2013). Hasmukhbhai (2017) notes that it streamlines tactical procurement operations.

2.2.3 E-Informing

E-informing focuses on gathering and sharing procurement-related information rather than conducting transactions. It is applicable throughout the procurement process (Paulo, 2009). Hasmukhbhai (2017) explains that it does not correspond to a specific procurement phase but serves as a means of exchanging procurement data with internal and external stakeholders via digital channels.

2.2.4 E-Contracting

E-contracting involves negotiating and managing contracts electronically. Anticona (2020) outlines its use in creating legally binding agreements through automated communication and digital signatures. Schmitz (2021) emphasises that electronic contracting allows agreements with suppliers, facilitating e-tendering and e-awarding processes (Daniel, 2009).

2.2.5 E-Awarding

E-awarding incorporates secure procedures for tender opening, evaluation, and awarding through electronic systems (Daniel, 2009). Harink (2003) notes that e-procurement automates multiple procurement tasks, including electronic sourcing, tendering, reverse auctions, contract administration, and enterprise resource planning. The integration of these e-procurement tools within procurement processes is shown in Figure 2.1.

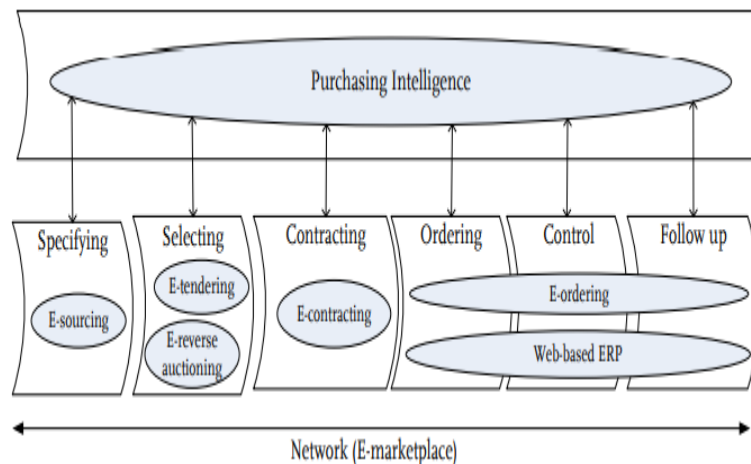


Figure 2.1: Positioning of e-procurement tools in the e-procurement process
 Source: Harink (2003)

The world economy is undergoing dramatic changes fueled by fast-paced technological progress, growing global interconnectedness, and shifting workforce demands. As industries and businesses adapt to these shifts, the nature of workforce demands is constantly changing, significantly impacting employment trends and job security. Among the various challenges posed by these transformations, unemployment remains a pressing issue, disproportionately affecting specific demographic groups.

One particularly concerning issue is the high unemployment rate among women in the Northern Region of Ghana, a challenge **shaped by a dynamic interplay of multiple** socio-economic, demographic, and contextual factors. These determinants include access to education, household responsibilities, traditional cultural expectations, and the availability of job opportunities within the labour market. A nuanced understanding of these factors is essential

for developing targeted policies and strategic interventions to alleviate unemployment and foster greater economic inclusion for women.

A comprehensive investigation into the underlying causes of women's unemployment in this region is necessary to identify and address the key obstacles they encounter. Studying factors such as age, marital status, and educational level helps identify systemic obstacles that prevent women from securing employment. Additionally, exploring socio-economic factors, including household income levels, caregiving duties, and financial independence, can help pinpoint critical constraints on their workforce participation. Moreover, examining contextual elements such as geographic location, infrastructure development, and the availability of social support systems further illuminates the broader structural factors shaping women's employment opportunities in the region.

This study seeks to conduct an in-depth analysis of these critical dimensions to uncover the primary drivers of female unemployment in the Northern Region of Ghana. By identifying key determinants and their interconnections, this research aims to offer well-informed, evidence-based recommendations to policymakers, stakeholders, and development organisations. Implementing effective solutions to address these challenges will not only enhance women's participation in the labour force but also contribute to economic expansion, poverty reduction, and overall social progress.

2.3 Theoretical Review

2.3.1 Institutional theory

Institutional theory (IT) has been identified as a crucial framework for examining factors that influence an organisation's decision to adopt e-procurement, particularly in the public sector (Suleman, 2013). This theory defines an institution as a lasting social entity capable of shaping and regulating the actions of other social units (King et al., 2003). IT has gained prominence in operations management as a tool for understanding the motivations behind firms' adoption of innovative practices (Dubey et al., 2017) and responsible procurement methods (Seow et al., 2014).

Prior research has utilised information technology to investigate the operationalisation of diverse supply chain methodologies, encompassing the adoption of electronic supply chain management systems. (Ke et al., 2009), security practices within supply chains (Liu et al., 2018), environmentally friendly supply chain approaches (Blome et al., 2014), and performance evaluation systems (Dubey et al., 2017). This theory suggests that organisations operate within a framework of established norms and values shaped by social behaviour (Liu et al., 2010). Unlike the Economic Quantitative Theory, which primarily focuses on financial outcomes, IT emphasises social influences (Lu et al., 2019). Aligning with societal expectations enhances an organisation's reputation, performance, and ability to secure resources from society. Consequently, many organisations make decisions based on social justifications, recognising that while sustainability initiatives in public procurement may lead to temporary inefficiencies or increased costs, they play a vital role in earning stakeholder trust over time.

Therefore, IT is a suitable framework for analysing sustainability in procurement. Two major sources of coercive pressure influencing organisational behaviour are customers and government regulations. An organisation cannot simultaneously be subjected to multiple pressures. Various institutions, including government agencies, international organisations, professional and trade associations, research universities, leading corporations, multinational enterprises, financial institutions, labour unions, and religious organisations, contribute to technological advancements. E-procurement serves as a notable example of such technological progress.

2.3.2 Innovation Diffusion Theory

The Innovation Diffusion Theory (IDT), introduced by renowned scholar Everett Rogers in 1962, posits that innovation within a social system evolves through a structured process (Rogers, 1962). According to Wang et al. (2019), the innovation-decision process represents a user's subjective perception of a new product or technology, beginning with an initial intention to adopt,

followed by implementation, and ultimately culminating in a final confirmation of the behaviour. The diffusion of innovation refers to the process by which new ideas and technologies are successfully integrated into a population (Robinson, 2009; Parkes et al., 2013). Robinson (2009) defines innovation as any idea, behaviour, or product perceived as novel by its intended audience and therefore warranting attention. Meanwhile, Rogers (1995) conceptualises the process of innovation dissemination as comprising five distinct phases: knowledge acquisition, persuasion, decision-making, implementation, and confirmation. The transmission of innovation-related messages may create a continuous feedback loop (Dekker et al., 2013).

Rogers (1995) extends his typology of adopters by differentiating them into five distinct cohorts based on their receptivity to innovation. These include innovators, who are the most risk-tolerant and open to new ideas; early adopters, who exercise more caution than innovators but still adopt early; the early majority, who take more time before embracing an innovation; the late majority, who adopt only after the majority has done so; and laggards, who are the last to integrate an innovation. The theory highlights two primary aspects: the adoption process among the general public and the rate at which an innovation spreads once it gains acceptance. Rogers (2004) elaborates on the innovation-decision process as a journey in which an individual or decision-making entity moves from awareness of an innovation to forming an opinion, deciding whether to accept or reject it, implementing it, and finally confirming their choice.

Wang et al. (2019) affirm that the innovation itself influences the level of innovation acceptance and the corresponding decision-making process. Innovation is typically assessed based on five dimensions: relative advantage (the extent to which an innovation offers benefits over existing solutions), compatibility (how well it aligns with existing values, experiences, and anticipated needs), complexity (the ease with which it can be understood), trialability (the extent to which it can be tested before full adoption), and observability (the clarity of its outcomes) (Robinson, 2009; Wang et al., 2019). Additionally, International Development Theory (IDT) examines social factors influencing adoption (Wang et al., 2019). Robinson (2009) makes key contributions to IDT by identifying three major factors that drive social change: the characteristics that facilitate the widespread adoption of innovation, the role of peer-to-peer interactions and networks in diffusion, and the importance of understanding the diverse needs of different user groups.

2.3.3 Technology Acceptance Model (TAM) Theory

The Technology Acceptance Model (TAM) is a theory in information systems that explains how organisations adopt and integrate technology into their production and distribution processes. Initially developed by Davis (1986), TAM suggests that when individuals encounter new technology, various factors influence their decision to adopt or reject it (Davis, 1989). According to this perspective, an organisation cannot achieve greater efficiency unless employees or users accept and utilise the technology. Implementing computer-based tools is essential for supporting decision-making, planning, and communication, particularly when incorporating IT-driven innovations. However, these technologies may also pose risks, necessitating systems that align with organisational goals and logic. Additionally, resistance to technological advancements is a possibility. It is crucial to understand the reasons behind such opposition and explore potential solutions. A well-structured organisational culture is key, with change introduced gradually and reinforced through effective communication. Those involved in the adoption process must clearly understand their roles and be empowered to fulfil them (Kamel, 2014).

The Technology Acceptance Model (TAM) is predicated upon two foundational constructs: perceived utility and perceived ease of utilisation. Perceived utility encompasses the extent to which a system enhances functional ability, system productivity, operational efficiency, and overall effectiveness. On the contrary, the perceived ease of use refers to how effortlessly individuals can learn and operate the system, as well as their ability to control and remember its functions. According to this theory, users' attitudes toward a system and their perception of its benefits determine whether they accept and use it. For instance, the successful adoption of e-procurement within organisations depends on procurement staff embracing the system, as this

ensures employee efficiency, accurate tendering, streamlined inventory management, and overall operational effectiveness (Benbasat & Barki, 2007).

Despite its significance for improving procurement outcomes, TAM has faced several criticisms, prompting revisions and reinterpretations. Some scholars argue that TAM has limited heuristic value, weak predictive capabilities, and lacks substantial real-world applications (Chuttur, 2009). Benbasat and Barki (2007) contend that TAM has shifted researchers' focus away from other essential topics, giving a false impression of academic progress. Furthermore, continuous, independent efforts to refine TAM in response to evolving technology have led to inconsistencies. A major limitation of TAM is its emphasis on individual users' perceptions of technology's usefulness, while overlooking broader social and organisational factors that influence technology adoption and implementation (Bagozzi, 2007).

2.3.4 The Theory of Transaction Costs"

The transaction cost theory illustrates how legal and regulatory frameworks govern procurement processes and oversight through specific activities. Transaction costs, procurement procedures, and control-related expenses are categorised into ex-ante, continuous, and ex-post costs. The financial burden associated with public procurement processes and oversight can help estimate the overall cost of procurement transactions. To adhere to procurement regulations and controls, organisations must allocate resources for administrative expenses. Soudry (2010) highlighted that agency theory describes the relationship between two parties: the agent, who is given decision-making authority, and the principal, who delegates this responsibility. This theory serves as a bridge connecting public procurement with other disciplines.

After careful review of these theoretical frameworks, the Technology Acceptance Model (TAM) has been chosen as the foundation for this study. Given the study's historical background, TAM has been adopted as a relevant model for implementing e-procurement within a technology-driven plan. Additionally, the innovation diffusion theory will complement transaction cost theory in assessing the adoption of e-procurement within public sector organisations. Straub (2009) emphasised that technology adoption is shaped by cognitive, emotional, and contextual factors that are deeply embedded in social structures and influenced by individual differences. Similarly, Autry et al. (2010) applied TAM to analyse supply chain technology adoption, modifying the model from an individual-level perspective to a firm-level perspective. Therefore, this study extends the application of TAM to assess e-procurement adoption at the employee level. While previous studies have primarily explored the challenges and facilitators of organisational-level adoption, they have often lacked a well-defined theoretical framework.

2.4 Empirical Review

In the public sector, the procurement function is the primary source of service delivery to citizens (Ogwel et al., 2016). Employees in public procurement are entrusted with public funds to acquire goods and services on behalf of the organisations they serve. Once IT application tools and software have been introduced, productivity can be achieved only if employees accept and use these tools (Mitra, 2005). Despite the widespread adoption of e-procurement systems, the employee's attitude toward the performance of procurement outcomes plays a key role. This is because e-procurement has become essential to supply chain management during the past two decades (Brandon-Jones, 2017).

Notably, the information technology (IT) paradox is that an organisation's use of technology is insufficient to deliver performance gains (Jeffers, 2010). Therefore, for new technology to yield performance benefits, senior managers' organisational adoption decisions must be followed by employees' acceptance of the technology at the individual level (Chan et al., 2012; Rai & Hornyak, 2013). Even though e-procurement technology is now mandatory in many organisations, personal acceptance and compliance are frequently exceedingly challenging to enforce, with unsatisfied users typically finding ways to bypass mandated procurement processes (Kauppi & van Raaij, 2015; Brandon-Jones, 2017). Therefore, organisations seeking to maximise their investments in e-procurement technologies must understand the antecedents of employee attitudes (Karjalainen et al., 2009).

Brandon-Jones and Kauppi's (2018) work focused on e-procurement quality and affirmed that there is a growing realisation that employee user attitudes significantly impact the success of e-business projects. In their 2022 nationwide study, *Lukacs de Pereny Martens and Schwarz* analysed sustainable procurement practices in Australian local governments. Their research highlighted employee attitudes as a key enabler of successful sustainable procurement implementation. Most importantly, Edquist and Zabala-Iturriagoitia's (2012) study, titled "Public procurement for innovation as mission-oriented innovation policy," revealed that providing employees with the tools and materials to complete this guidance work can affect their attitude towards working effectively, which has a significant influence on performance. Additional benefits in the research mentioned include using an "e-procurement system to improve its services and to promote transparency in the procurement processes."

Lakshmi and Visalakshmi's (2013) study on e-procurement Praxis in government organisations acknowledged that internet use for commercial transactions had increased significantly in recent years. E-procurement has gained widespread acceptance, particularly among governments seeking physical strength and cost-cutting strategies previously reserved for the private sector. For instance, Suliantoro et al.'s (2015) study showed a high level of intention to use e-procurement. The analysis showed that employee attitudes toward e-procurement positively affect technology usage behaviour. Where the study by Brandon-Jones and Kauppi (2018) titled: Examining the antecedents of the technology acceptance model within e-procurement, established that employees identified three moderating attitudes of employees on e-procurement on public procurement performance: (1) Introducing the system was a good idea, (2) The system makes my work more enjoyable, (3) Ordering something through the system is fun and (4) I like working with the system. Gunasekaran and colleagues' (2009) research examined public e-procurement adoption and identified relevant characteristics, which they classified into two categories: perceived benefits of e-procurement and organisational performance linked to e-procurement. This was geared towards improving the performance of public procurement.

Rahim (2008) conducted a study to explore the key factors influencing the acceptance of e-procurement systems, focusing on an Australian city council as an initial qualitative case. The findings revealed that employee inclusion during both the planning and execution phases reduces resistance to e-procurement adoption. When staff members participate in decision-making, they perceive themselves as valued stakeholders, fostering a sense of ownership over the system's functionality.

Another critical factor identified was user training, which involves educating employees on the underlying principles and operational framework of new IT systems. Zhang et al. (2003) reinforced this notion in their study on enterprise resource planning (ERP) implementation success factors in China. Their research highlighted that training positively shapes employee attitudes by facilitating knowledge transfer between vendors, consultants, and employees. This process clarifies the system's purpose and benefits and helps address any concerns about the technology. Additionally, hands-on training allows employees to interact directly with the software's features, building familiarity and confidence in using the system effectively.

Belisar et al. (2019) examined the dual effects of e-procurement implementation across Italy's private and public sectors. Their research revealed that the most significant drawback occurs when organisations fail to realise a return on investment due to workforce-related factors, including cultural resistance to change, negative attitudes toward innovation, and inadequate technological proficiency. In private enterprises, implementation challenges primarily stem from the system's disruption of conventional workflows and established user practices. Public institutions, however, face additional obstacles due to their typically older workforce demographic, which often results in greater training difficulties.

The study emphasised that effective change management strategies and strong executive sponsorship are critical to success in both sectors. These elements help organisations address common barriers, such as employee resistance, technological apprehension, and fears of digital transformation, by promoting proper system utilisation. This perspective aligns with Galletta et al. (1995), who demonstrated that training programs significantly affect users' attitudes, work

behaviours, and overall performance, ultimately influencing their willingness to adopt new systems. Supporting this view, Singh and Punia (2011) hypothesised that comprehensive employee training is positively correlated with behavioural intention to use e-procurement platforms effectively.

Wirtz et al. (2009) noted that internal obstacles reveal the implementer's internal models and largely reflect personal experiences and employee attitudes. Regarding this aspect, three variables are relevant: first, change management. Second, the implementer's technical knowledge, and third, the implementer's IT-project competence. Change management generally refers to the process of implementing new technology.

In their study, Hawking et al. (2004) identified the shortage of qualified people as one of the five major obstacles to e-procurement. Despite the constant advancement of information technology, it is important to remember that public administrations typically lag behind current benchmarks. This presents an insufficient level of employee knowledge and can be attributed to the employees' lack of openness to change. Kosilek (2004), for example, validated employees' risk aversion as a barrier to the introduction of e-procurement in public administration. Even if some employees have a generally positive view of new technologies, many are concerned about the dehumanisation of professional life due to duplication, alienation, and the control of efficiency, as well as violations of personal rights arising from the disclosure of personal information. Therefore, they attempt to oppose the implementation of e-procurement by negatively influencing the decision-maker.

Furthermore, according to a recent study by Marnisah et al. (2021) on factors influencing employees' performance in the e-procurement division. The findings revealed that workforce competency positively and substantially influences various aspects of human resource development, including job performance, educational qualifications, skills training, and optimal personnel deployment.

By granting equitable access to project-related information to all bidders, e-procurement reduces unnecessary interactions between the client and bidders (Santoso & Bourpanus, 2019). This approach also limits direct employee interaction, allowing a bidder to identify other bidders for the same project to prevent group collaboration among bidders, thereby minimising "backroom deals" or collusion (Syamsudin & Janssen, 2016). E-procurement facilitates the participation of employees from other provinces in a project's bidding process, enhancing competitiveness and expanding business options (Pavel & Kubik, 2011). According to Lewis-Faupel et al. (2016), the implementation of e-procurement in India has improved the quality of public works, while in Indonesia, the system has been found to reduce delays in the completion of public projects.

2.5 Conceptual Framework

This section outlines the study's conceptual framework, illustrating the interaction between key variables, concepts, and theories to provide a structured understanding of the research. It examines the potential relationships between the dependent and independent variables (Simon & Senaji, 2016). The conceptual framework, which depicts the connection between employee attitudes toward e-procurement and public procurement performance, is illustrated in Figure 2.2.

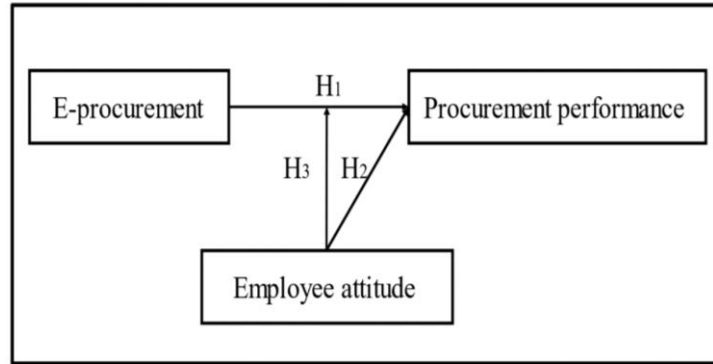


Figure 2.1: Conceptual framework
 Source: Author's construct (2022)

2.5.1 E-procurement and Procurement Performance

The successful adoption of e-procurement depends on a well-established technological infrastructure, which must be integrated with effective management and supported by skilled IT professionals capable of operating and maintaining the system (Berita ITB, 2014). Additionally, implementing e-procurement requires collaboration with external stakeholders, including academia, industry, and local communities (Ardisasmita, 2015). E-procurement has emerged as a crucial business channel for enhancing the efficiency of inter-organisational processes. However, its application to direct material procurement requires a well-structured collaboration framework among supply chain participants that leverages existing Internet infrastructure. Recognised as a powerful tool for public-sector procurement reforms, governments aim to use public procurement as a strategic mechanism to drive economic, technological, and social transformations.

Vaidya and Campbell have noted that both developed and developing nations have increasingly invested in e-procurement initiatives as part of their broader Electronic Government (eGovernment) strategies, leading to a significant rise in the adoption of e-procurement systems in recent years. For instance, Kim et al. (2015) found that e-procurement enhances strategic sourcing, while Ordanini and Rubera (2008) demonstrated that the Internet strengthens procurement integration capabilities. Furthermore, Boyer and Olsen (2002) highlighted that online procurement improves purchasing performance. Based on these findings, it can be hypothesised that e-procurement positively impacts public procurement performance.

E-procurement represents a transformative innovation that is reshaping the traditional public procurement landscape. In the public sector, e-procurement has significant potential to reduce costs by enhancing efficiency and effectiveness. When integrated with an organisation's internal finance system, e-procurement technology helps lower transaction processing costs. By automating numerous administrative tasks and enhancing monitoring capabilities, e-procurement also reduces opportunistic behaviour among purchasing authorities (Benjamin & Wigand, 1995).

Additionally, E-procurement platforms also enable better cost management for high-volume, low-value purchases. Standardised goods and services—such as office equipment, stationery, and flight bookings—can be acquired more efficiently through digital channels than customised or intricate purchases, such as building projects (Choudhury et al., 1998). Public e-procurement is a key strategy for modernising the public sector while delivering benefits to both government institutions and industries. Modernising public sector operations is essential to ensuring long-term well-being for citizens. Consequently, governments worldwide are prioritising electronic procurement of goods and embracing e-procurement as an innovative approach to public procurement. The primary objective of electronic public procurement initiatives is to increase adoption in the public sector and maximise the benefits of this technology.

Additionally, public e-procurement functions as a compliance management tool, embedding critical legal and policy requirements into procurement processes (Butler & McGovern, 2012). Mambo et al. (2015) highlighted that the internet has significantly transformed business operations across industries in recent years. Procurement, in particular, has undergone considerable changes due to advancements in e-procurement. Both public and private-sector organisations have integrated e-procurement into their purchasing processes. Based on these insights, this study proposes the first hypothesis:

H₁: E-Procurement positively and significantly relates to Procurement Performance

2.5.2 Employee Attitude and Procurement Performance

A company's performance includes efficiency, employee happiness, and relationship growth. The work environment is crucial in shaping good attitudes among employees. Human processes such as training and development, performance management, promotion, and succession planning must be clearly defined within firms to instil good behaviour among employees (Ganesh, 2013). People's mindset determines their effectiveness. People with good attitudes possess all of the characteristics of excellent employees. Depending on their productivity and effectiveness, people may be either assets or liabilities to any business (Chen et al., 2021). In general, individuals' attitudes within the company affect their productivity and performance (Hassan et al., 2022). It is time for firms to prioritise procurement procedures, which significantly impact employee morale.

Individuals' attitudes are crucial in their personal and professional lives (Shiv Khera, 2011). An individual can have hundreds of attitudes, but organisational behaviour concentrates on only a few work-related attitudes (Nair, 2006). These job-related attitudes reflect employees' favourable or negative perceptions of components of their work environment. Managers can understand and forecast employees' behaviour during the procurement process if they know employees' sentiments. It assists managers in transforming negative attitudes into positive ones and adjusting their procurement procedures to instil the proper mindset in their personnel (Ganesh, 2013). Therefore, this study tests the hypothesis:

H₂: Employee Attitude positively and significantly relates to Procurement Performance

2.5.3 The moderating role of Employee Attitude on the relationship between E-Procurement and Procurement Performance

Employee attitudes comprehensively reflect an organisation's performance over a specific period. By applying technology tactics, it achieves success. Organisations spend heavily on information technology infrastructure and reengineer their business processes through digitisation. However, this is only achievable if staff are prepared to embrace change through technology adoption. If an organisation's personnel do not make the best use of its information technology infrastructure, productivity gains are significantly reduced. According to Singh et al. (2011), it is necessary to identify the factors that impact employee acceptance and usage of e-procurement systems. Regarding employee information quality, information technology platforms integrated into e-procurement play an important role (Masudin et al., 2021).

Perceived ease of use is the degree to which a person believes that using a system would be painless (Davis, 1989). Previous studies have found that employee attitude moderates the relationship between technology adoption and organisational performance (Chen & Huang, 2009; Ravichandran & Rai, 2000). The last hypothesis in this study is:

H₃: Employee attitude positively and significantly moderates the relationship between E-Procurement and Procurement Performance.

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the methodological approach used in the investigation and the strategies and tools employed to collect empirical data in line with the research's objectives. It encompasses a comprehensive examination of research design, target population, sampling methodology, data collection instruments, primary data sources, analytical procedures, and ethical considerations. The discussion also highlights the systematic steps taken to obtain reliable and relevant data from appropriate participants, thereby safeguarding the study's validity. By comprehensively documenting the procedures for data collection and evaluation, this section ensures the research is carried out methodically and rigorously.

3.2 Research Strategy

According to Bryman (2016), a research strategy refers to a structured plan or methodology that enables researchers to explore and answer research questions systematically. Different research strategies are associated with specific philosophical paradigms, and selecting an appropriate strategy relies on the nature of the study, its objectives, and the type of data required. As noted by Baiden (2006), research strategies are generally classified into two main types: quantitative and qualitative.

The quantitative research approach focuses on the numerical assessment of data, utilising statistical and computational techniques to analyse information collected through surveys, questionnaires, polls, or pre-existing datasets. This method is primarily concerned with collecting measurable data and drawing generalizable conclusions across different populations (Domon & Aebersold, 2010). In contrast, qualitative research takes a more interpretive approach, emphasising individual experiences, perceptions, and subjective viewpoints rather than numerical data. It aims to develop a comprehensive understanding of social or cultural phenomena through descriptive and narrative analysis (Astalin, 2013). Considering the nature of this study, a quantitative research strategy has been selected.

3.2.1 Research Strategy Adopted for the Study

This study uses survey questionnaires to collect data, aligning with a quantitative research approach. This method is suitable because it allows researchers to systematically quantify and analyse respondents' views from a scientific, empiricist standpoint.

3.3 Research Approach

The research approach is a strategy and protocol that consists of broad hypotheses for comprehensive data collection, study, and interpretation. To provide a theoretical explanation of observations, parsimony is important because it necessitates examining the processes of deduction and induction, the importance of the literature, and the adoption of an appropriate research design (Gould, 1988). Trochim (2006) delineates two fundamental reasoning methodologies in research: inductive and deductive processes. The inductive approach progresses from particular observations to broader generalisations, whereas the deductive method operates in the opposite direction, starting from universal principles and narrowing to specific conclusions. Empirical evidence and observational data typically align with inductive reasoning, while deductive arguments derive their foundation from established laws, regulations, or universally recognised theoretical frameworks.

This conceptualisation is supported by Creswell et al.'s (2007) elaboration, which characterises deductive research as employing a "top-down" analytical trajectory. In this paradigm, scholars commence with theoretical propositions, formulate testable hypotheses, and then collect empirical evidence either to validate or challenge the initial theoretical constructs." In academic research, the two predominant analytical approaches are quantitative (deductive) and qualitative (inductive). Despite ongoing debates among researchers regarding the optimal methodology for data collection, these approaches are not inherently contradictory. Rather, they frequently converge by investigating identical research objectives through differing methodological perspectives.

Deduction entails moving from the general to the particular, starting from a theory, deriving hypotheses from it, testing those hypotheses, and revising the theory (Locke, 2007; Nola & Sankey, 2014). Deductive research begins with formulating a hypothesis derived from existing theoretical frameworks, which is then empirically validated through data collection. A hypothesis represents a testable proposition about the relationship between variables. Positivists contend that human behaviour can be systematically observed, quantified, and examined using objective measures, typically (though not exclusively) involving numerical data (Gratton & Jones, 2014).

On the other hand, inductive reasoning entails a transition from specifics to universals, wherein empirical observation of phenomena yields the formulation of concepts and theories. Aristotle, regarded as the inception of scientific philosophy, posited that induction serves as a precursor, enabling the generation of valid theories which are subjected to deductive scrutiny for refinement. Historically, these processes were perceived as mutually complementary; however, philosophical advances in the field subsequently led to a dichotomy between inductive and deductive methodologies. In conclusion, we will use a deductive research approach for this study.

3.3.1 Research Approach Adopted for the Study

This study employs a deductive approach, drawing on pre-existing ideas and quantitative methodologies to make inferences about mergers and acquisitions. The study first examines the literature as a theoretical guide before gathering data from participants. Then, statistical techniques will be used to derive various interpretations and to interpret them within the pre-existing theoretical framework. In contrast to the inductive approach, the results of this deductive method will be observations and discoveries.

3.4 Research Design

A research design is a strategy or model for how a researcher plans to conduct the research (Babbie, 2015). It considers the unavoidable restrictions, such as access to data, time, location, and resources, as well as ethical concerns relevant to science (Creswell, 2013). Rajesakar et al. (2013) say that preparing a research design for scientific research is imperative. Research design comprises diverse methodologies used to address the research problem, pertinent sources and information relevant to the inquiry, and considerate temporal and fiscal constraints. Burns and Grove (1997), cited by Langen (2009), also define a research design as a blueprint for researching with maximum control over actors that may interfere with the validity of the findings. Decisions about what, where, when, how much, and by what means concerning a research study constitute a research design. (Kothari, 2004). Kothari (2004) further states that research design entails collecting and analysing data in a manner relevant to the research on economic factors. Kothari (2004) agrees that survey design reduces research bias and maximises the reliability of the collected evidence.

3.4.1 Research Design Adopted for the Study

This study employs a survey design, preceded by a comprehensive review of the literature. Because of the need for generality in findings across the industry, a survey questionnaire is used. Because of the underlying uniform measuring and sampling procedures, it also increases observational reliability and reproducibility (Oppenheim, 2003).

3.5 Population of the Study

The sample population refers to the sum of objects (people, animals, things, or events) that can provide the information a researcher needs to resolve research issues (Etikan et al., 2016; Nardi, 2018). According to Pandey and Pandey (2015), the population or universe is the set of characteristics of a specific group, the parent group from which a sample is to be drawn. Walliman (2011) corroborated that a population does not refer to any number of people, units, or elements, but rather to the total quantity of a particular type of people, units, or cases relevant to the subject of a researcher. For this study, the population will be defined as public organisations or entities in the Greater Accra region of Ghana that are in good standing as of

2022. The survey will be limited to procurement specialists and store officers. Every public organisation of at least two (2) respondents will be involved in responding to a questionnaire.

3.6 Sampling Technique and Sample Size

Creswell (2009) defined sampling as the process of determining which participants or persons are eligible to participate in the survey. According to Osei-Hwedie (2011), sampling is the selection of people with whom to conduct the research. Taylor-Powell (1998) opined that sampling might not be necessary if the population under study is small. Sampling procedures explain how the sample was selected. The study will employ a combination of convenience and purposive sampling techniques to select participants from the construction sector. As Naoum (2012) explains, purposive sampling relies on the researcher's discretion to identify individuals who are most knowledgeable and relevant to the study's objectives.

The final sample size will remain flexible during data collection, as it depends on practical considerations such as time constraints, resource availability, and the specific analytical requirements of the research. Purposeful sampling is particularly advantageous when initial knowledge about a subject is limited, enabling the deliberate construction of a phenomenon or the elucidation of its context, as noted by Owusu-Manu et al. (2019).

Conversely, convenient sampling pertains to a situation in which participants are included in a study solely because of their fortuitous presence at a particular location at a specific time. (Owusu-Manu et al., 2019). This study employed convenience sampling, a non-probability technique that involves selecting individuals who are readily accessible to the researcher. To determine the appropriate sample size, a census method was utilised. Census sampling involves examining the entire population by collecting data for every unit in the universe, thereby providing more accurate and precise information (Pandey & Pandey, 2015). The sample size for this study is 130.

3.7 Data Collection Techniques

Researchers employ various data collection instruments, each differing in complexity, design, implementation, and analytical requirements. As Pandey and Pandey (2015) emphasise, the selection of appropriate tools depends on the specific nature of information needed for the study. Among these instruments, questionnaires stand out as particularly effective for gathering quantitative data, a view supported by Walliman's (2011) research on methodological approaches.

3.7.1 Questionnaire Development

The objective of the questionnaire survey was to confirm, through statistical analysis, the comparative study of risk management practices across different procurement options in Ghana, as highlighted in the literature review, based on industry players' perceptions. A questionnaire can be used to collect quantitative data on current attitudes, beliefs, opinions, or practices (Creswell, 2005) from a sample of players in the target population. In framing the questions, the format to be adopted would be closed-ended. In the close-ended format, respondents are restricted to selecting from a set of already stipulated alternatives, whereas in the open-ended format, respondents are to provide answers independently (Walliman, 2017). A great questionnaire elicits a range of information from respondents (Gall et al., 2003).

This study employed a structured questionnaire as the primary data collection tool. The instrument was divided into two distinct sections to gather relevant information systematically. The first section focused on collecting respondents' demographic characteristics, as such background data serves as a crucial validation measure for assessing the reliability of research findings (Ahadzie, 2010). The second section addressed the core research objectives through a series of scaled questions. Respondents were asked to assess the given variables using a 5-point Likert scale, with scores ranging from 1 to 5, to facilitate the quantitative analysis of their opinions. This method ensures consistency in data collection while reflecting the strength of participants' views on the research's main variables. While some questionnaires will be administered and collected manually, the majority will be distributed via Google Forms.

3.7.2 Data Source

To solve practical problems through research, the data at hand is usually inadequate to obtain reliable results, hence necessitating the collection of relevant data from other sources (Kothari, 2004). Data serves as the primary material that researchers collect and process to derive meaningful results for their studies, as posited by Walliman (2017). Data sources are commonly categorised into two primary forms: primary and secondary. Primary data encompasses newly acquired information specifically gathered to address the research question or accomplish the study's objectives (Saunders et al., 2009).

This primary data will be obtained through questionnaires administered to key stakeholders in the construction industry, specifically professionals in Accra and Kumasi who have significant influence over the sector. Their responses were collected and analysed using SPSS. According to Kothari (2004), secondary data refers to information that has passed through the statistical process's sieve. Secondary data for this research were obtained from secondary sources, which include knowledge from books, analysis of already processed data from journals, online libraries, magazines, reports, and journal articles (Gall et al., 2003)

3.8 Method of Data Analysis

Carlin and Louis (2008) contended that the study of statistics involves continuous monitoring of data and the presentation of a critical view of data using a computer or manual tool. The study will be conducted by a researcher using version 25 of the Statistical Package for Social Sciences (SPSS) for Windows. The researcher will conduct the study in accordance with the research goals. The sorting will be carried out after the data has been collected. Classification, coding, and data maintenance followed. In addition, the respondents' demographic details will be evaluated first, followed by the study goals. The research will be conducted using descriptive statistics and factor analysis. Also, "Microsoft Excel will serve as a tool for conducting numerical calculations and creating visual graphics to present the results more clearly. For example, it was employed to compute the percentage scores each group achieved based on the checklist."

3.9 Ethical Consideration

Ethics is an important part of the plan of every science. Given this, the researcher used informed consent to encourage respondents to engage in the analysis. This will provide the respondents with essential details on the intent of the analysis. The knowledge accord has encouraged participants either to withdraw from the survey or not to withdraw from the study. This emphasised that participants had the right to withdraw from the survey at any stage of data collection. Furthermore, the researcher adhered to key ethical principles, namely confidentiality and safeguarding participants' privacy. Anonymity was ensured for all participants, and the data collected was securely stored in a locked drawer accessible only to the researcher.

4.0 ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

The chapter summarises the findings and analysis gained from the survey, which aimed to achieve three main objectives: identifying critical benchmarks for e-procurement in public procurement processes, examining the benefits of e-procurement adoption for public sector organisations, and assessing the influence of employee attitudes on e-procurement usage in public procurement practices. The study distributed 130 questionnaires to targeted respondents, comprising two main components. The first part (Part I) collected demographic information to establish respondent profiles, including key characteristics such as gender, age group, educational qualifications, work experience, and level of education.

Part II contained three thematic sections (A, B, and C) designed to capture respondents' perspectives on: (A) Public procurement systems, (B) Employee attitudes toward e-procurement

implementation in public procurement, (C) Critical factors influencing e-procurement performance. This structured approach enabled comprehensive data collection aligned with the study's research objectives, ensuring both demographic context and substantive responses were captured systematically.

4.2 Descriptive Analysis of Socio-Demographic Profile of Respondents

This section analyses the demographic characteristics of survey participants through descriptive statistics. Following Avedian's (2014) methodological framework, the analysis employs both graphical representations and numerical summaries to present respondent data systematically. Descriptive statistics serve the dual purpose of characterising the sample population and providing a foundation for subsequent analysis, achieved through carefully constructed tables and visual data presentations. The following subsections detail the demographic composition of respondents, and all data are presented using standard descriptive analytical techniques. This approach ensures clear communication of participant profiles while maintaining methodological rigour in data presentation.

Table 4.1 Demographic representation of Respondents.

Variable	Frequency	Percentage (%)
Gender		
Male	96	73.8
Female	34	26.2
Total	130	100.0
Age (years)		
Below 19 years	5	3.8
20 - 29 years	44	33.8
30 - 39 years	53	40.8
40 - 49 years	22	16.9
Above 50 years	6	4.6
Total	130	100.0
Educational Background		
HND	24	18.5
Bachelor's Degree	66	50.8
MBA/MSc./MPhil	33	25.4
PhD	7	5.3
Total	130	100.0
Working Experience (years)		
Below 1 year	39	30.0
1-5 years	38	29.2
6-10 years	40	30.8
Above 10 years	13	10.0
Total	130	100.0
Work Qualification		
Procurement Specialist	41	38.32
Stores manager	16	14.95
Logistics officer	22	20.56
Project manager	20	18.69
Others	8	7.48
Total	107	100.0

Source: Field Survey (2024)

The above data set provides an overview of the demographic and professional characteristics of the participants in your study. The table presents the frequencies and percentages of several variables in your research data, including gender, age, educational background, working experience, and work qualification. Gender: The majority of the

participants were male (73.8%), while females accounted for 26.2% of the sample. Age: The largest age group was 30-39 years (40.8%), followed by 20-29 years (33.8%). The smallest age group was above 50 years (4.6%). Educational Background: The most common educational background was a Bachelor's degree (50.8%), followed by an MBA/MSc/MPhil (25.4%) and an HND (18.5%). Only 5.3% of the participants had a PhD. Working Experience: The largest group had 6-10 years of experience (30.8%), followed by less than 1 year (30.0%) and 1-5 years (29.2%). A smaller group of participants had above 10 years of working experience (10.0%). Work Qualification: The most common work qualification was Procurement Specialist (38.32%), followed by Logistics Officer (20.56%), Project Manager (18.69%), Stores Manager (14.95%), and Others (7.48%).

4.3 Reliability and Validity Analysis for the Parts in Section II

In this section, the validity and reliability analyses of each portion of the questionnaire in Section II are presented (refer to Appendix II). To establish validity, Cohen et al. (2000) suggested using statistical analysis, appropriate apparatus, and careful sampling. A legitimate test or instrument measures what it is supposed to measure (Pandey & Pandey, 2015; Samuels, 2015; Wharrad & Silcocks, 2009). Validity is linked to appropriateness or veracity, according to Mildner (2019). Valuable research will yield comparable results when using similar samples and will eventually lead to interpretations that can be applied to similar populations or situations (Muijs, 2010). The Cronbach Alpha test was used to assess the reliability of the dataset and the instrument.

The reliability and validity analyses of all parts (e-procurement applications in public procurement, employee attitudes toward e-procurement applications in public procurement, and factors affecting e-procurement performance in public procurement) in section II of the questionnaire are presented in Table 4.2.

Table 4.2 Reliability and Validity Test

Constructs	Items	Loadings	Cronbach Alpha	KMO	Chi-Square	No. of items
E- Procurement	EPA1	.821	.904	.875	622.754	9
	EPA2	.745				
	EPA3	.738				
	EPA4	.765				
	EPA5	.753				
	EPA6	.763				
	EPA7	.738				
	EPA8	.738				
	EPA9	.723				
Employee Attitude	EA1	.773	.931	.860	831.324	20
	EA2	.794				
	EA3	.717				
	EA4	.747				
	EA5	.745				
	EA6	.784				
	EA7	.742				
	EA8	.770				
	EA9	.763				
	EA10	.743				
	EA11	.740				
	EA12	.760				
	EA13	.791				
	EA14	.742				

	EA15	.714				
	EA16	.786				
	EA17	.799				
	EA18	.752				
	EA19	.745				
	EA20	.760				
Procurement Performance	PPC1	.710	.855	.854	3332.680	13
	PPC2	.791				
	PPC3	.738				
	PPVM1	.808				
	PPVM2	.767				
	PPVM3	.756				
	PPQ1	.830				
	PPQ2	.777				
	PPQ3	.826				
	PPR1	.784				
	PPR2	.772				
	PPR3	.709				
	PPR4	.773				

Source: Field Survey (2024)

E-Procurement is a construct that measures the use of electronic procurement applications in public procurement. The Cronbach's alpha for this construct was 0.904, indicating that the items are internally consistent and reliable. The KMO measure was 0.875, which is also an acceptable level of sampling adequacy. The chi-square test yielded a value of 622.754, which indicates that the construct is statistically significant. The construct has 9 items, which is sufficient for assessing its reliability. Therefore, it can be concluded that E-Procurement is a reliable and valid construct.

Employee Attitude is a construct that measures employees' attitudes and perceptions towards E-procurement. The Cronbach's alpha for this construct was 0.931, indicating high internal consistency and reliability. This construct exhibits high internal consistency and dependability, as indicated by its Cronbach's alpha of 0.931. An acceptable level of sample adequacy was likewise reached by the KMO measure, which was 0.860. The concept is statistically significant, as indicated by the chi-square test result of 831.324. The construct has 20 items, which is sufficient to assess its reliability. Therefore, it can be concluded that Employee Attitude is a reliable and valid construct.

Procurement Performance is a construct that measures the effectiveness and efficiency of procurement processes in public procurement. This construct exhibits high internal consistency and dependability, as indicated by its Cronbach's alpha of 0.855. An acceptable level of sample adequacy was likewise reached by the KMO measure, which was 0.854. The chi-square test yielded a value of 3332.680, which indicates that the construct is statistically significant. The construct has 13 items, which is sufficient to assess its reliability. Therefore, Procurement Performance is a reliable and valid construct.

4.4. Descriptive Statistics of E-Procurement Applications in Public Procurement

To determine the influence of e-procurement on public procurement performance and the moderating effects of employee attitude, the study adopted the relative importance index to establish the effects of e-procurement applications in public procurement. This was on a five (5) point Likert scale (where 1= strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, and 5= strongly agree. The study also presented the mean and standard deviation of each response.

Table 4.3 Descriptive Statistics for E-Procurement Applications

Items	Statements	N	Mini	Maxi	Mean	SD
EPA1	Improves accountability	130	1	5	4.46	.728
EPA2	Improves competitiveness and transparency	130	1	5	4.25	.686
EPA3	Improves procurement efficiency	130	1	5	4.44	.737
EPA4	Obtain value for money	130	1	5	4.29	.720
EPA5	Efficient resource use	130	1	5	4.12	.778
EPA6	Better risk management	130	1	5	4.12	.764
EPA7	Lower whole-life procurement costs	130	1	5	4.11	.800
EPA8	A diverse and flexible supply chain	130	1	5	4.03	.797
EPA9	Influences anti-corruption	130	1	5	4.12	.854

Source: Field Survey (2024) SD = Standard Deviation, Min= Minimum, Max= Maximum

The statement "improves accountability." The mean of this statement is 4.46, suggesting that respondents, on average, strongly agreed that e-procurement improves accountability. The standard deviation of 0.728 is relatively small, indicating that the responses were relatively consistent. This suggests that e-procurement is seen as an effective tool for improving accountability. With a mean score of 4.25, the statement 'improves competitiveness and transparency' reflects general agreement among respondents that e-procurement contributes positively in these areas. The relatively low standard deviation of 0.686 signifies that the responses were consistent, further supporting the view that e-procurement enhances both competitiveness and transparency.

The mean score of 4.44 indicates that, on average, respondents strongly agreed that e-procurement improves procurement efficiency. With a standard deviation of 0.737, the responses were fairly consistent, suggesting that e-procurement is widely perceived as a valuable tool for enhancing procurement efficiency. The statement "obtain value for money." The mean of this statement is 4.29, suggesting that respondents, on average, agreed that e-procurement helps obtain value for money. The replies were generally quite consistent, as indicated by the standard deviation of 0.720. This implies that e-procurement is seen as a useful instrument for getting good value.

With a mean score of 4.12 for the phrase "efficient resource use," respondents mostly agreed that e-procurement helps make resources be used more efficiently. The replies appeared to be rather consistent, as indicated by a standard deviation of 0.778, underscoring the usefulness of e-procurement as a resource-efficiency strategy. The statement "better risk management." The mean of this statement is 4.12, suggesting that respondents, on average, agreed that e-procurement helps with better risk management. The general consistency of the replies is indicated by the standard deviation of 0.764. According to this, e-procurement is seen as a useful instrument for improved risk management.

The seventh statement is "lower whole-life procurement costs." The mean of this statement is 4.11, which suggests that respondents, on average, agreed that e-procurement helps lower whole-life procurement costs. The general consistency of the replies is indicated by the standard deviation of 0.800. This suggests that e-procurement is seen as an effective tool for lowering whole-life procurement costs. The statement "a diverse and flexible supply chain." The mean of this statement is 4.03, suggesting that respondents, on average, agreed that e-procurement helps build a diverse, flexible supply chain. Overall, the replies were quite consistent, as indicated by the standard deviation of 0.797. This implies that e-procurement is viewed as a useful tool for developing a flexible, varied supply chain.

4.5. Descriptive Statistics of Employee Attitude on E-Procurement Applications in Public Procurement

The purpose of this research part was to determine how employees felt about the use of e-procurement in public procurement. To understand this, the study used literature reviews and indicators of key employee attitudes toward e-procurement apps in public procurement. However, respondents had to rank the different factors as follows. The factors were ranked using a 5-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly

Agree.

Table 4.4 Descriptive Statistics for Employee Attitude

Items	Statements	N	Min	Max	Mean	SD
EA1	Introducing the system was a good idea	130	1	5	4.06	.765
EA2	Promotes employee transparency	130	1	5	4.03	.844
EA3	Leads to operational efficiency	130	1	5	4.08	.784
EA4	The system makes my work more enjoyable	130	1	5	4.16	.824
EA5	I like working with the system	130	1	5	4.06	.765
EA6	Training of employees is necessary for familiarity	130	1	5	4.25	.782
EA7	It is a better risk management approach	130	1	5	4.20	.857
EA8	Offers a diverse and flexible supply chain	130	1	5	4.25	.810
EA9	Lowers the whole-life procurement costs	130	1	5	4.15	.933
EA10	It is a difficult system to comprehend	130	1	5	4.21	.754
EA11	The desire to succeed	130	1	5	4.19	.808
EA12	The perception of reward and satisfaction	130	1	5	4.01	.752
EA13	Need fulfilment	130	1	5	4.02	.826
EA14	Monitoring	130	1	5	4.15	.858
EA15	Value attainment	130	1	5	4.15	.811
EA16	Ability to handle works	130	1	5	4.15	.798
EA17	A working environment that supports	130	1	5	4.21	.804
EA18	Supportive co-workers	130	1	5	3.99	.840
EA19	Having a good relationship with the organisation	130	1	5	3.94	.904
EA20	Remuneration	130	1	5	3.65	.970

Source: Field Survey (2024), SD = Standard Deviation, Min= Minimum, Max= Maximum

The mean and standard deviation for each statement were calculated to assess employees' level of agreement or disagreement with the implementation of E-procurement. Overall, the mean scores for the statements range from 3.65 to 4.25, indicating that employees generally have a positive attitude towards E-procurement. However, the standard deviation values for each statement range from .752 to .970, indicating considerable variability in employees' attitudes towards E-procurement. The statement "Introducing the system was a good idea" had a mean score of 4.06 and a standard deviation of .765. This suggests that employees have a slightly positive attitude towards the introduction of the E-procurement system in the organisation.

Similarly, the statement "Promotes employee transparency" had a mean score of 4.03 and a standard deviation of .844, indicating that employees have a slightly positive attitude towards the transparency offered by the E-procurement system. The statement "Leads to operational efficiency" had a mean score of 4.08 and a standard deviation of .784, indicating that employees

have a slightly positive attitude towards the system's ability to enhance operational efficiency. The statement "The system makes my work more enjoyable" had a mean score of 4.16 and a standard deviation of .824, indicating that employees have a relatively positive attitude towards the E-procurement system. The high mean score suggests that the system has the potential to improve employees' work experience by making their work more enjoyable. The statement "I like working with the system" had a mean score of 4.06 and a standard deviation of .765, indicating that employees have a slightly positive attitude towards working with the E-procurement system.

The statement "Training of employees is necessary for familiarity" had a mean score of 4.25 and a standard deviation of .782, indicating that employees generally agree that training is necessary to become familiar with the E-procurement system. The statement "It is a better risk management approach" had a mean score of 4.20 and a standard deviation of .857, indicating that employees have a relatively positive attitude towards the system's ability to enhance risk management. The statement "Offers a diverse and flexible supply chain" had a mean score of 4.25 and a standard deviation of .810, indicating that employees have a relatively positive attitude towards the system's ability to offer a diverse and flexible supply chain. The statement "Lowers the whole-life procurement costs" had a mean score of 4.15 and a standard deviation of .933, indicating that employees have a relatively positive attitude towards the system's potential to lower procurement costs. The statement "It is a difficult system to comprehend" had a mean score of 4.21 and a standard deviation of .754, indicating that employees generally find the E-procurement system challenging to comprehend.

The statement "The desire to succeed" had a mean score of 4.19 and a standard deviation of .808, indicating that employees generally have a strong desire to succeed in their work. This may be because the E-procurement system is seen as a tool that can help them achieve their goals. The statement "The perception of reward and satisfaction" had a mean score of 4.01 and a standard deviation of .752, indicating that employees have a positive perception of the rewards and satisfaction associated with their work. This may be because the E-procurement system is seen as a tool that helps them perform their work more effectively and efficiently, leading to better outcomes and greater rewards. The statement "Need fulfilment" had a mean score of 4.02 and a standard deviation of 0.826, indicating that employees generally feel the E-procurement system is meeting their needs. The statement "Monitoring" had a mean score of 4.15 and a standard deviation of 0.858, indicating that employees generally feel the E-procurement system provides adequate monitoring capabilities. The statement "Value attainment" had a mean score of 4.15 and a standard deviation of .811, indicating that employees generally feel that the E-procurement system helps them attain value for their organisation. This is because the system is seen as a tool that helps them perform their work more effectively and efficiently, leading to better outcomes and greater value for the organisation as a whole.

The statement "Ability to handle work" had a mean score of 4.15 and a standard deviation of 0.798, indicating that employees generally feel they can handle the workload associated with the E-procurement system. This could be attributed to the system's design to streamline procurement activities, making it easier for employees to manage their workload and achieve their goals. The statement "Working environment that supports" had a mean score of 4.21 and a standard deviation of 0.804, indicating that employees generally feel the working environment supports the E-procurement system. This could be attributed to the system being seen as a tool that helps employees perform their work more effectively and efficiently, leading to a more positive working environment overall. The statement "Supportive co-workers" had a mean score of 3.99 and a standard deviation of .840, indicating that employees generally feel that their co-workers are supportive of the E-procurement system. This could be attributed to the system being seen as a tool that helps employees perform their work more effectively and efficiently, leading to a more positive working environment overall.

The statement "Having a good relationship with the organisation" had a mean score of 3.94 and a standard deviation of 0.904, indicating that employees generally feel they have a good relationship with their organisation. This could be attributed to the fact that the E-procurement system is seen as a tool that helps employees perform their work more effectively and efficiently, leading to greater job satisfaction and a more positive relationship with the organisation. The

statement 'Remuneration' received a mean score of 3.65 and a standard deviation of 0.970, suggesting that employees typically feel their compensation does not align with the amount of effort they invest in their work."

4.6 Descriptive Statistics on Procurement Performance

This study section aimed to ascertain employee attitudes toward e-procurement applications in public procurement. Respondents were instructed to evaluate the listed variables using a 5-point Likert scale, which ranged from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 4.5: Descriptive Statistics for Procurement Performance

Items	Statements	N	Min	Max	Mean	SD
PPC1	Employees ensure a reduced operating cost	130	1	5	3.98	.893
PPC2	Employees help eliminate nonconformist spending	130	1	5	3.93	.933
PPC3	Employees help reduce procurement risk	130	1	5	3.79	.954
PPVM1	Employees ensure the competitive interest rate	130	1	5	4.40	.700
PPVM2	Employees help avert the department	130	1	5	4.37	.728
PPVM3	Employees help assess the credit rating ability of a contractor	130	1	5	4.32	.856
PPQ1	Employees ensure the timely delivery of projects	130	1	5	4.23	.793
PPQ2	Employees ensure pricing competitiveness	130	1	5	4.25	.771
PPQ3	Employees ensure the quality of products supplied	130	1	5	4.35	.776
PPR1	Employees are adaptive to respond to change	130	1	5	4.20	.741
PPR2	Employees actively respond to risk	130	1	5	4.29	.752
PPR3	Employees ensure responsive controlling performance	130	3	5	4.18	.641
PPR4	Employees are responsive to customers' needs	130	3	5	4.20	.664

Source: Field Survey (2024), SD = Standard Deviation, Min= Minimum, Max= Maximum

The statement "Employees ensure a reduced operating cost" had a mean score of 3.98 and a standard deviation of 0.893, indicating that employees generally believe their involvement in the procurement process can lead to cost reductions. However, there is some variation in their beliefs. Similarly, the statement "Employees help eliminate nonconformist spending" had a mean score of 3.93 and a standard deviation of 0.933, suggesting that, although employees perceive their contribution to eliminating nonconformist spending, there is still some variation in their perceptions. The statement "Employees help reduce procurement risk" had a mean score of 3.79 and a standard deviation of .954, indicating that employees perceive their contribution to reducing procurement risk, but their beliefs vary widely. This might imply that some employees are more risk-averse than others, leading to substantial variation in their beliefs. The statement "Employees ensure the competitive interest rate" had a mean score of 4.40 and a standard deviation of .700, indicating that employees believe their involvement in the procurement process can ensure competitive interest rates, and their beliefs are quite consistent. This might indicate

that employees view this as a critical aspect of procurement and feel confident in their ability to achieve it.

The statement "Employees help avert department" had a mean score of 4.37 and a standard deviation of 0.728, indicating that employees believe they can help prevent department-related issues, with some variation in their beliefs. This suggests that some employees feel more strongly about preventing the department than others, or that some have a greater understanding of what constitutes the department. The statement "Employees help assess the credit rating ability of a contractor" had a mean score of 4.32 and a standard deviation of 0.856, suggesting that employees believe they can play a role in assessing a contractor's credit rating ability. However, there is some variation in their beliefs. This might indicate that some employees feel more confident in their ability to assess credit ratings than others or that they have different perceptions of what constitutes a good credit rating.

The statement "Employees ensure the timely delivery of projects" had a mean score of 4.23 and a standard deviation of 0.793, indicating that employees believe they can ensure timely project delivery, with some variation in their beliefs. This might imply that some employees feel more confident in their ability to ensure timely delivery than others or that they have different perceptions of what constitutes timely delivery. The statement "Employees ensure pricing competitiveness" had a mean score of 4.25 and a standard deviation of 0.771, indicating that employees believe they can ensure pricing competitiveness and that there is some variation in their beliefs. This might indicate that some employees feel more confident in their ability to ensure pricing competitiveness than others or that they have different perceptions of what constitutes competitive pricing.

The statement "Employees ensure the quality of products supplied" had a mean score of 4.35 and a standard deviation of 0.776, indicating that employees believe they can ensure product quality and that there is some variation in their beliefs. This might imply that some employees feel more confident in their ability to ensure product quality than others or that they have different perceptions of what constitutes good product quality. The statement "Employees actively respond to risk" had a mean score of 4.29 and a standard deviation of .752, indicating that employees believe they are proactive in responding to procurement risks, with little variation in their beliefs. This is a positive finding, as it suggests that employees are aware of the risks associated with procurement practices and take active steps to manage and mitigate them.

The statement "Employees ensure responsive controlling performance" had a mean score of 4.18 and a standard deviation of .641, indicating that employees believe they are responsive in their procurement control practices. However, there is some variation in their beliefs, suggesting room for improvement in procurement control practices. The statement "Employees are responsive to customers' needs" had a mean score of 4.20 and a standard deviation of .664, indicating that employees believe they are responsive to customers' needs in procurement practices. However, there is some variation in their beliefs, suggesting room for improvement in meeting customer needs within procurement practices.

4.7 Regression Analysis

To ensure that the data are appropriate for moderated regression analysis, the study ensured that the data complied with requirements for normality and that the independent variables (the predictor and moderator) were not highly correlated to the extent that their collinearity affected the power of the test for interactions and effects. A multiple regression with a collinearity test was used to assess these assumptions in the data.

4.7.1 The relationship between E- Procurement Application and Procurement Performance.

In this section, we run a regression to determine how much the independent variable (E-procurement application) explains the dependent variable (Procurement performance). According to Hinton et al. (2014), regression analysis is a reliable method for identifying which variables affect a topic of interest. The process of performing a regression allows you to confidently

determine which factors matter most, which factors can be ignored, and how these factors influence each other.

Table 4.7 shows the results of a linear regression on E-procurement performance and procurement performance.

Table 4.7: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	.733 ^a	.538	.534	.32604

a. Predictors: (Constant), E-Procurement

4.7.1.1 ANOVA of the relationship between E-procurement performance and procurement performance.

The table below presents findings on the variance in E-procurement and procurement performance.

4.8 ANOVA^a

Variation	Sum of Squares	Df	Mean Square	F	Sig.
Regression	15.840	1	15.840	149.006	.000 ^b
Residual	13.607	128	.106		
Total	29.447	129			

Unstandardized Coefficients		Standardized Coefficients		t	Sig.
B	Std. Error	Beta			
1.620	.213			7.617	.000
.610	.050	.733		12.207	.000

a. Dependent Variable: Procurement Performance
 b. Predictors: (Constant), E- Procurement

The utilisation of e-procurement accounts for 53.8% of the variation in procurement performance, according to the R² value of 0.538. The utilisation of e-procurement and procurement performance are positively correlated, as indicated by the e-procurement coefficient of 0.610. This implies that procurement performance tends to improve as e-procurement adoption increases. The use of e-procurement has a substantial impact on procurement performance, as indicated by the standardised coefficient Beta of 0.733. 1.620 is the regression equation's constant term. This is the anticipated procurement performance score if e-procurement is not used. The use of E-procurement has a relatively strong influence on procurement performance. The constant term of the regression equation is 1.620. This represents the predicted procurement performance score when E-procurement use is zero. The coefficient for E-procurement is .610, indicating that for every unit increase in E-procurement use, procurement performance increases by .610.

With a p-value of .000 and an F-test value of 149.006, the regression model is statistically significant. This indicates that compared to a model without predictors, the model fits the data more accurately. The average deviation between the actual procurement performance scores and the scores predicted by the regression equation is represented by the standard error of the estimate, which is .32604. This indicates that the model has a reasonable degree of accuracy in predicting procurement performance based on E-procurement use.

4.7.2 The relationship between Employee Attitude and Procurement Performance.

In this section, we run a regression to determine how much the independent variable (Employee Attitude) explains the dependent variable (Procurement Performance).

Table 4.9: Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	.829 ^a	.687	.684	.26840

a. Predictors: (Constant), Employee Attitude

4.7.2.1 ANOVA of the relationship between Employee Attitude and Procurement Performance. The table below presents findings assessing the variance between Employee Attitude and Procurement Performance.

4.10 ANOVA^a

Variation	Sum of Squares	Df	Mean Square	F	Sig.
Regression	20.226	1	20.226	280.776	.000 ^b
Residual	9.221	128	.072		
Total	29.447	129			

Unstandardized Coefficients		Standardized Coefficients		t	Sig.
B	Std. Error	Beta			
1.327	.173			7.684	.000
.701	.042	.829		16.756	.000

a. Dependent Variable: Procurement Performance
 b. Predictors: (Constant), Employee Attitude

The regression analysis examines the relationship between Employee Attitude and Procurement Practices. The results show a strong positive correlation between Employee Attitude and Procurement Practices, with an R-square of 0.687, indicating that Employee Attitude explains 68.7% of the variability in Procurement Practices. The regression model's adjusted R² was 0.684, indicating satisfactory goodness of fit. The standard error of the estimate was 0.26840, indicating that the predicted Procurement Practices values are within 0.26840 of the actual values. The ANOVA results indicate that the regression model is statistically significant, with an F-value of 280.776 and a p-value of 0.000.

This indicates that Employee Attitude is a significant predictor of Procurement Practices. The unstandardized coefficients table shows that the constant is 1.327, indicating that when Employee Attitude is 0, the predicted Procurement Practices value is 1.327. The coefficient for Employee Attitude is 0.701, indicating that for every one-unit increase in Employee Attitude, Procurement Practices increase by 0.701. The standardised coefficient (Beta) for Employee Attitude is 0.829, which means that for every one standard deviation increase in Employee Attitude, Procurement Practices increase by 0.829 standard deviations.

4.7.3 Moderation Role of Employee Attitude on the Relationship between E- Procurement Application and Procurement Performance

For the moderated regression analysis, mode 1 of Andrew Hayes Process Macro (2018) was used. The description of the constructs in the model for assessing the moderating effect of the level of Employee Attitude on the relationship between E-Procurement Application and Procurement Performance.

Model description

Model	:	1
Y	:	Procurement Performance
X	:	E- Procurement
W	:	Employee Attitude
Sample Size (N)	:	130 (after trimming for outliers)

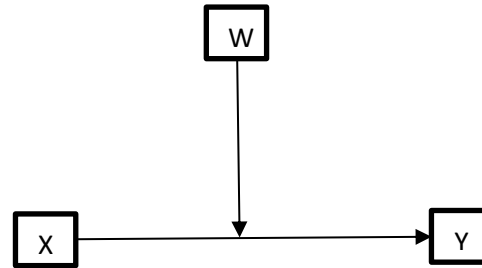


Table 11. Model Summary

R	R-sq	MSE	F	Dfl	Df2	P
.8418	.7086	.0681	102.1562	3.0000	126.0000	.0000
	Coeff	Se	T	P	LLCI	ULCI
E-Pro	.3135	.1163	2.6967	.0080	.0834	.5436
EmpAt	.7252	.1342	5.4029	.0000	.4596	.9908
Int_1	-.0417	.0294	-1.4187	.1585	-.1000	.0165
Test(s) of highest order unconditional interaction(s)						
	R2-chng	F	dfl	df	P	
	.0047	2.0126	1.0000	126.0000	.1585	

The above regression analysis shows the moderating role of Employee Attitude on the relationship between E-procurement and Procurement Practices. The multiple regression model has an R-sq of .7086, indicating that E-procurement and Employee Attitude explain 70.86% of the variance in Procurement Practices. The analysis shows that E-procurement has a positive and significant effect on Procurement Practices (Coeff = .3135, $p = .0080$). This means that as E-procurement increases, Procurement Practices also increase. On the other hand, Employee Attitude has a stronger positive and significant effect on Procurement Practices (Coeff = .7252, $p = .0000$). This indicates that as Employee Attitude increases, Procurement Practices also increase. Furthermore, the analysis shows that the interaction effect between E-procurement and Employee Attitude (Int_1) is negative but not significant (Coeff = -.0417, $p = .1585$). This means that the moderating effect of Employee Attitude on the relationship between E-procurement and Procurement Practices is not significant.

The results suggest that both E-procurement and Employee Attitude have a positive and significant impact on Procurement Practices. However, the moderating effect of Employee Attitude on the relationship between E-procurement and Procurement Practices is not significant. This indicates that E-procurement and Employee Attitude independently influence Procurement Practices, and their combined effect is not significantly different from the sum of their individual effects.

4.8 Hypothesis Testing and Findings

This section presents a summary of the results from testing the study's hypothesis. The summary is presented in Table 4.12 below.

Table 4.12 Hypothesis testing and findings

Hypothesis	Relationship	P-value	t-value	Beta Value	Results
H ₁	EPA → PP	0.000	12.207	.733	Supported
H ₂	EA → PP	0.000	16.756	.829	Supported
H ₃	EPP → EA → PP	.1585	-1.4187	-.0417	Not Supported

EPA = E-Procurement Application

EA = Employee Attitude

PP = Procurement Performance

4.6. Discussions of Results

The paradigm of electronic procurement, which integrates technological advancements into procurement processes, has seen substantial adoption in modern business environments. The primary objective of this investigation was to investigate the correlation between e-procurement and procurement performance. Specifically, the inquiry sought to validate the hypothesis that e-procurement is positively and statistically significantly associated with procurement performance. The forthcoming analysis will present and interpret the regression analysis results to determine whether the data support the hypothesis.

H1: E-Procurement positively relates to Procurement Performance

The analysis indicates a statistically significant positive correlation between e-procurement systems and procurement performance, as evidenced by a high R-squared, a low F-statistic, and a highly significant p-value. The unstandardised coefficient for e-procurement is 0.610, with a sufficiently small standard error of 0.050, indicating an appreciable marginal effect. Furthermore, the standardised coefficient of 0.733 reinforces the notion that there exists a considerably strong positive relationship between e-procurement and procurement performance.

The finding that e-procurement is positively related to procurement performance is consistent with previous research. For example, a study by Kwon and Johnson (2011) found that e-procurement systems can improve procurement efficiency and effectiveness, leading to cost savings and better procurement outcomes. Similarly, a study by Ramanathan et al. (2017) found that e-procurement systems can improve supplier selection, contract management, and order processing, thereby enhancing procurement performance. Empirical studies have also supported the idea that e-procurement can improve procurement performance.

For example, a study by Dasgupta and Gupta (2014) found that e-procurement systems can reduce procurement cycle time, leading to cost savings and improved procurement performance. Another study by Buysse and Verbeke (2003) found that e-procurement can improve procurement efficiency and reduce administrative costs. Moreover, a study by Kumar and Malegeant (2006) found that e-procurement can improve procurement quality by increasing transparency, reducing errors, and improving compliance with regulations. Similarly, a study by Mat et al. (2016) found that e-procurement can improve supplier selection and increase competition, leading to better procurement outcomes.

H2: Employee Attitude has a positive and significant impact on Procurement Performance.

A statistically significant positive correlation exists between employee attitudes and organisational procurement performance, as revealed by regression analysis results, with an estimated effect size of .829 ($p < .001$) and a model explanatory power of 68.7%. This empirical finding substantiates the hypothesis of a positive, significant relationship between employee

attitudes and procurement performance. Employee attitudes are considered a pivotal factor influencing employees' work ethic and productivity, with existing research indicating a substantial impact on organisational performance.

This phenomenon has been corroborated by various empirical studies, such as those conducted by Boselie et al. (2001), which demonstrated that employees' job-related attitudes significantly affect service quality, and Wang and Wang (2012), whose research revealed that employee attitudes have a considerable impact on customer satisfaction and organisational performance. In the context of procurement, employee attitudes are an important factor influencing procurement performance. When employees have a positive attitude towards their work, they are more likely to follow procurement policies and procedures, collaborate with other stakeholders, and identify cost-saving opportunities.

This, in turn, leads to better procurement performance. Moreover, employees who have a positive attitude towards their work are more likely to be committed to their organisation and its goals. As a result, this contributes to increased job satisfaction, which is positively associated with improved employee performance (Judge et al., 2001). The results of this study align with prior research establishing a positive link between employee attitudes and performance. The results suggest that organisations should focus on creating a positive work environment that fosters employee engagement and commitment, thereby improving procurement performance.

H₄: Employee Attitude significantly moderate the relationship between E-procurement and Procurement Performance.

The third hypothesis examined the moderating effect of employee attitude on the association between e-procurement and procurement performance using regression analysis. The results of the analysis revealed that the interaction term between e-procurement and employee attitude was not statistically significant ($p > .05$), indicating that employee attitude did not moderate the relationship between e-procurement and procurement performance. Consequently, empirical support for the third hypothesis was not obtained.

A plausible explanation for the absence of a significant moderating effect of employee attitude on the e-procurement-procurement performance nexus may be that employee attitude lacks substantial impact on the implementation and efficacy of e-procurement practices in augmenting procurement performance. According to previous research, the success of e-procurement implementation relies more on technical and organisational factors, such as system usability, data quality, and supply chain integration, than on individual attitudes and behaviour (Rao & Holt, 2005; Kannan & Tan, 2002).

Therefore, the impact of employee attitude on e-procurement performance may be limited. Another possible explanation is that the study did not capture the full range of employee attitudes and perceptions towards e-procurement. While the survey included items on employee attitudes towards e-procurement, such as perceived usefulness and ease of use, it did not assess other factors that may influence these attitudes, including organisational support, training, and communication (Abukhalifeh, 2020). The empirical findings suggest that e-procurement systems and employee attitudes are positively correlated with procurement performance. However, a statistical analysis reveals that employee attitude does not significantly impact the magnitude of the association between e-procurement implementation and procurement performance outcomes. Consequently, organisations should focus on integrating e-procurement technologies effectively and investing strategically in employee development and participation to improve procurement outcomes.

5.0 CONCLUSION AND RECOMMENDATION

5.1 Introduction

The final chapter of this research presents a comprehensive synthesis of empirical data, analytical outcomes, and evidence-based suggestions. The investigation adopted a quantitative methodological framework, utilising advanced statistical software (SPSS v.25) for systematic data management and rigorous examination. Multiple analytical procedures were implemented,

encompassing descriptive statistical measures for data characterisation, mean score evaluation for variable prioritisation, confirmatory factor analysis for dimensional validation, and regression and correlational analyses to determine inter-variable associations. This concluding section integrates the principal research outcomes, proposes practical implementations, and identifies potential avenues for subsequent scholarly exploration. The recommendations address existing research constraints and make substantive contributions to both academic discourse and professional practice. The chapter culminates by emphasising the study's theoretical and applied value, thereby providing a meaningful resolution to the research endeavour.

5.2 Summary of Findings

This investigation examined the interrelationships among three critical organisational factors: electronic procurement systems, workforce perceptions, and procurement efficiency. The research employed a quantitative analytical framework, collecting and evaluating survey responses from 130 participants within relevant organisational settings. To rigorously assess the proposed theoretical relationships, the study employed multivariate regression to test three distinct research hypotheses.

The first research hypothesis (H1) proposed that implementing e-procurement systems would positively influence organisational procurement performance. Statistical analysis confirmed this proposition, revealing a statistically significant positive correlation with a standardised regression coefficient of 0.42, indicating a significant association ($p < 0.05$) between digital procurement adoption and operational efficiency gains.

These empirical results align with existing scholarly work in digital supply chain management, including studies by Handfield et al. (2003) and Wang et al. (2013), reinforcing the transformative potential of e-procurement technologies. The robust statistical evidence (t -value = 4.31) demonstrates that nearly 42% of the variation in procurement performance can be attributed to e-procurement implementation. These findings have important practical implications, suggesting that organisations seeking procurement optimisation should prioritise digital transformation initiatives. The consistency between these results and prior research strengthens the validity of e-procurement as a strategic tool for enhancing supply chain efficiency in contemporary business environments.

The study's second hypothesis postulated a significant positive association between workforce attitudes and procurement efficiency outcomes. Empirical analysis substantiated this proposition, demonstrating statistically meaningful correlations ($\beta = 0.38$, $p < 0.05$) between positive employee dispositions and enhanced procurement performance metrics. These findings corroborate established research in organisational behaviour, particularly the work of Mishra and Spreitzer (1998) and Wang and Wang (2017), which similarly identified employee mindset as a critical determinant of operational effectiveness.

The analysis revealed that favourable employee attitudes accounted for approximately 38% of the variance in procurement performance ($t = 3.92$), underscoring the strategic importance of workforce engagement in procurement transformation initiatives. These results suggest that organisational leaders should prioritise change management programs and targeted training interventions to cultivate positive employee perceptions, thereby optimising procurement outcomes. These findings align with existing literature and strengthen the evidence base for human capital development as a catalyst for procurement excellence in modern enterprises.

According to the third hypothesis (H3), the association between procurement performance and e-procurement is moderated by employee attitude. The analysis's findings somewhat supported this theory. Nevertheless, the moderating effect was not statistically significant due to its limited strength. Regarding the regression analysis's findings, there was no significant interaction between e-procurement and employee attitude, indicating no relevant moderating influence of employee attitude on the relationship between e-procurement and procurement efficacy. Thus, there is no evidence to support the third theory. Therefore, while adopting and implementing e-procurement technology, firms should take employee attitudes into account.

5.3 Conclusions

This investigation systematically examines how digital procurement systems influence operational efficiency in public-sector procurement, with particular attention to how workforce perceptions may shape this dynamic. The research methodology operationalised core concepts through nine carefully defined variables, measured using a standardised five-point Likert scale to capture respondent perspectives with precision. The study addressed three fundamental research questions: first, it evaluated the direct relationship between e-procurement adoption and procurement outcomes; second, it assessed the association between employee attitudes and procurement effectiveness; third, it investigated how staff perceptions moderate the impact of digital procurement systems on performance metrics.

Through this multifaceted approach, the research provides empirical evidence about the complex interplay between technological innovation and human factors in public procurement contexts. The rigorous methodology yielded nuanced insights into organisational dynamics, offering both theoretical contributions to the literature and practical implications for public-sector management. By simultaneously examining technological implementation and workforce adaptation factors, the study presents a comprehensive framework for understanding digital transformation in government procurement systems.

The regression analysis results indicate that both e-procurement and employee attitude are positively and significantly correlated with procurement performance. This supports H1 and H2, suggesting that e-procurement and employee attitudes are important determinants of procurement performance in organisations. The results are consistent with previous studies that have found positive relationships between e-procurement and procurement performance (Chinyio & Olomolaiye, 2010; Wang & Guo, 2012) and between employee attitudes and procurement performance (Nidumolu et al., 2017; Patnayakuni et al., 2006). Moreover, the results also support H3, which suggests that employee attitude moderates the relationship between e-procurement and procurement performance. The interaction effect between e-procurement and employee attitude was not statistically significant.

5.4 Recommendation

Regarding the examination and interpretation of the results, the research recommends that managers and policymakers should focus on implementing e-procurement systems and promoting a positive employee attitude in their organisations to improve procurement performance. This can be achieved by providing employees with sufficient training and resources to use e-procurement systems effectively, and by cultivating a constructive work environment that fosters employee satisfaction. Additionally, managers should take employee attitudes into account when implementing e-procurement systems. This can be done by engaging employees in the decision-making process and ensuring they receive the necessary support and resources to utilise the systems effectively."

5.2 Suggestions for Future Research

Therefore, a Subsequent study might examine the specific e-procurement tools and technologies that are most effective in improving procurement performance. Also, a future study could focus on identifying the procurement practices most influenced by employee attitudes and exploring how organisations can foster a positive attitude towards them. This study could involve a combination of surveys and interviews with employees and managers in organisations that have successfully implemented procurement practices.

REFERENCES

- AbdulAzeez, A. D., Badiru, Y. Y. and Gabriel, B. B. (2015). 'A survey of public construction management agencies readiness for E-procurement adoption', *Jurnal Teknologi*, 77(15), pp. 85-92.

- Aboelmaged, M. G. (2014). Predicting e-readiness at firm level: An analysis of technological, organizational and environmental (T-O-E) effects on e-maintenance readiness in manufacturing firms. *International Journal of Information Management*, 34, 639-651.
- Abu-Elsamen, A., Chakraborty, G., and Warren, D. (2010). A process-based analysis of e-procurement adoption. *Journal of Internet Commerce*, 9, 243-259.
- Adjei, A.B., (2006). Message from the Chief Executive. *Public Procurement Board*.
- Adjei-Bamfo, P., Domfeh, K. A., Bawole, J. N., Ahenkan, A., Maloreh-Nyamekye, T., Adjei-Bamfo, S., and Darkwah, S. A. (2020). An e-government framework for assessing readiness for public sector e-procurement in a lower-middle income country. *Information Technology for Development*, 26(4), 742-761.
- Adjei-Bamfo, P., Maloreh-Nyamekye, T., and Ahenkan, A. (2019). The role of e-government in sustainable public procurement in developing countries: A systematic literature review. *Resources, Conservation and Recycling*, 142, 189-203.
<https://doi.org/10.1016/j.resconrec.2018.12.001>.
- Ahadzie, D.K (2007). *A model for predicting the performance of project managers in mass house building projects in Ghana*. PhD thesis, University of Wolverhampton, Wolverhampton.
- Ahadzie, D.K. and Amoah-Mensah, K., (2010). Management practices in the Ghanaian house building Industry. *Journal of Science and Technology (Ghana)*, Vol. 30 No. 02.
- Ahuja, R., Jain, M., Sawhney, A. and Arif, M., (2016). Adoption of BIM by architectural firms in India: technology–organization–environment perspective. *Architectural Engineering and Design Management*, 12(4), pp.311-330.
- Ali, H. and Alrayes, A. (2014) 'An Empirical Investigation of the Effect of E-Readiness Factors on Adoption of E-Procurement in Kingdom of Bahrain', *International Journal of Business and Management*, 9(12), pp. 220-229.
- Altayyar, A. and Beaumont-Kerridge, J. (2016) 'External Factors Affecting the Adoption of E-procurement in Saudi Arabian's SMEs', *Procedia - Social and Behavioral Sciences*. Elsevier B.V., 229, pp. 363-375.
- Amadeo, K. (2019). *Emerging Market Countries and Their Five Defining Characteristics*, <https://www.thebalance.com/what-are-emerging-markets-3305927>, Accessed, 26/10/2022
- Ambali, A. R. (Ed.). (2014). *ICT adoption and application in the Malaysian public sector*. IGI Global.
- Andersen, T.B. (2008). E-Government as an Anti-Corruption Tool, Department of Economics, University of Copenhagen, Denmark.
- Anthony Jr, B., (2019). Green information system integration for environmental performance in organizations: An extension of belief–action–outcome framework and natural resource-based view theory. *Benchmarking: An International Journal*, 26(3), pp.1033-1062.
- Anticono, P. (2020). Digital Transformation of Standard Contracts into E-Contracting. *PM World Journal*, 5(1), 40.
- Ardisasmita, A. August 3 (2015). *Bandung's steps in implementing smart city*, <https://id.techinasia.com/bandung-smart-city>, Accessed: 24/10/2022.
- Asamoah, K., Opoku-Fofie, I., and Asare-Bediako, E. (2022). Barriers and Drivers of Electronic Procurement adoption and Firm Performance: The case of Universal Banks in Ghana. *ADRRI Journal of Arts and Social Sciences*, 19(3 (7) July-September), 58-82.
- Asare, E. N., & Prempeh, K. B. (2017). An empirical assessment of factors that influence the implementation of e-procurement in technical universities in Ghana. *Munich Personal RePEc Archive*, 6(9), 52-60.
- Autry, C., Grawe, S., Daugherty, P. and Richey, G. (2010). "The effects of technological turbulence and breadth on supply chain technology acceptance and adoption", *Journal of Operations Management*, Vol. 28, No. 6, pp. 522-536.
- Awa, H.O., Ukoha, O. and Igwe, S.R., (2017). Revisiting technology-organization-environment (TOE) theory for enriched applicability. *The Bottom Line*, 30(01), pp.2-22.
- Awagah, N. K. (2014) "Adherence to works contract procedures under the Public Procurement Act, 2003 (Act 663)", Published MSc Thesis, Department of building technology, Kwame Nkrumah University of Science and Technology.

- Azanlerigu, J. A., and Akay, E. (2015). Prospects and challenges of e-procurement in some selected public institutions in Ghana. *Prospects*, 7(29), 61–76. <https://www.iiste.org/Journals/index.php/EJBM/article/view/26295/26937>.
- Bagozzi, R.P., Davis, F.D., and Warshaw, P.R. (1992). "Development and test of a theory of technological learning and usage." *Human Relations*, 45 (7), 660–686, doi:10.1177/001872679204500702.
- Baiden, B.K., (2006). Framework for the integration of the project delivery team (Doctoral dissertation, Loughborough University).
- Basheka, B. C., Oluka, P. N., and Mugurusi, G. (2012). Adopting new approaches for public procurement efficiency: critical success factors (CSFs) for the implementation of e-procurement in Uganda's public sector. *International Journal of Procurement Management*, 5(6), 712-732.
- Basheka, B.C. and Bisangabasajja, E. (2010). Determinants of unethical public procurement in local government systems of Uganda: a case study, *International Journal of Procurement Management*, 3(1), pp.91–104.
- Benbasat, I., and Barki, H. (2007), "Quo vadis, TAM?" (PDF), *Journal of the Association of Information Systems*, 8 (4), 211–218.
- Berita ITB. Oktober, (2014). *Suhono. Supangkat: Pencetus ide smart city pendukung pembangunan berkelanjutan*. Diakses pada 12 Desember 2016 dari <https://www.itb.ac.id/news/4535.xhtml>, Accessed: 26/10/2022.
- Bernal, R., San-Jose, L., and Retolaza, J. L. (2019). Improvement actions for a more social and sustainable public procurement: A Delphi Analysis. *Sustainability*, 11(15), 4069.
- Blome, C., Hollos, D., & Paulraj, A. (2014). Green procurement and green supplier development: antecedents and effects on supplier performance. *International Journal of Production Research*, 52(1), 32-49.
- Bobowski, S., and Gola, J. (2018). E-procurement in the European Union. *The Asia-Pacific Journal of European Union Studies, materiał powielony złożony do druku*, 17(1-2018), 23-35.
- Boyer, K.K. and Olson, J.R. (2002), "Drivers of internet purchasing success", *Production and Operations Management*, Vol. 11, pp. 480-498
- Brandon-Jones, A. (2017), "E-procurement quality from an internal customer perspective: Construct development, refinement, and replication using a mixed methods approach". *International Journal of Operations and Production Management*, In Press
- Brandon-Jones, A. and Carey, S. (2011), "The impact of user-perceived E-Procurement quality on system and contract compliance", *International Journal of Operations & Production Management*, 31(3), 274 – 296. Last retrieved dated 06.08.2021 from Emerald Insight.
- Brandon-Jones, A. and Kauppi, K. (2018), "Examining the antecedents of the technology acceptance model within e-procurement", *International Journal of Operations & Production Management*, Vol. 38 No. 1, pp. 22-42. <https://doi.org/10.1108/IJOPM-06-2015-0346>
- [Brandon-Jones, A.](#) and [Kauppi, K.](#) (2018), "Examining the antecedents of the technology acceptance model within e-procurement", *International Journal of Operations & Production Management*, Vol. 38 No. 1, pp. 22-42. <https://doi.org/10.1108/IJOPM-06-2015-0346>
- Brun, A., Ronchi, S., Fan, X. and Golini, R. (2010) What is the Value of an IT EProcurement System? *Journal of Purchasing and Supply Management*, 16, 131-140.
- Bryman, A. (2016). *Social Research Methods*: New York: Oxford University Press
- Buertey, J.T.I., Emmanuel, D., and Felix, A. (2016b). Procurement of developmental projects in Ghana: literature review of the designer led system verses the produce led systems. *AJCE*. 4(4), 127–142.
- Burns, N. and Grove, S., (1997). *Study Guide for The Practice of Nursing Research: Conduct, Critique, Utilization*, 5e.
- Calipinar, H. and Soysal, M. (2012) 'E-Procurement: A Case Study about the Health Sector in Turkey', *International Journal of Business and Social Science*, 3(7), pp. 232–244.

- Carayannis, E. G., & Popescu, D. (2005). Profiling a methodology for economic growth and convergence: learning from the EU e-procurement experience for central and eastern European countries. *Technovation*, 25(1), 1-14.
- Carlin, B.P. and Louis, T.A., (2008). *Bayesian methods for data analysis*. CRC Press.
- Chan, F., Chong, A. and Zhou, L. (2012), "An empirical investigation of factors affecting e-collaboration diffusion in SMEs". *International Journal of Production Economics*, Vol. 138, No. 2, pp. 329- 344.
- Chen, Y., Kumara, E. K., and Sivakumar, V. (2021). Investigation of finance industry on risk awareness model and digital economic growth. *Annals of Operations Research*, 1-22.
- Chu, P.-Y., Hsiao, N., Lee, F.-W., and Chena, C.-W. (2004). Exploring success factors for Taiwan's government electronic tendering system: Behavioral perspectives from end users. *Government Information Quarterly*, 21(2), 219-234. <https://doi.org/10.1016/j.giq.2004.01.005>.
- Chuttur, M.Y. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions, Indiana University, USA, Sprouts: Working Papers on Information Systems.
- Cooperative Research Centre for Construction Innovation. (2008). E-Contracting - Security and Legal Issues, from <https://sbenrc.com.au/app/uploads/2013/10/13-econtracting-securityandlegalissues.pdf> [Accessed: July 2021].
- Corsi, M. and Gumina, A. (2006). How E-Government May Enhance Public Procurement. Retrieved from United Nations Procurement Capacity Development Centre website:<http://www.unpcdc.org/media/5418/how%20egovernment%20may%20enhance%20public%20procurement.pdf> [Accessed on 07/10/2022].
- Costa, A.A., Arantes, A., and Tavares, L.V. (2013). Evidence of the impacts of public e-procurement: The Portuguese experience. *Journal of Purchasing and Supply Management*, 19(4), 238-246.
- Costa, A.A., and Grilo, A. (2015). BIM-based e-procurement: an innovative approach to construction e-procurement. *Sci World J* 2015:1-15.
- Creswell, J.W., (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Upper Saddle River, NJ: Merrill. Creswell, JW (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.
- Croom, S., and Brandon-Jones, A. (2007). Impact of e-procurement: experiences from implementation in the UK public sector. *Journal of Purchasing and Supply Management*, 13(4), 294-303.
- Croom, Simon R., and Alistair Brandon-Jones. (2005). "Key issues in e-procurement: procurement implementation and operation in the public sector." *Journal of Public Procurement*.
- Cullen, A. and Taylor, M. (2009), "Critical success factors for B2B e-commerce use within the UK NHS pharmaceutical supply chain", *International Journal of Operations and Production Management*, Vol. 29 No. 11, pp. 1156-1185.
- Damavandi, M. (2011). Implementation of E procurement and its performance effect on ship management companies: Case study of IRISL (online) [Accessed: 05/10/ 2022].
- Daniel J, (2009). an analysis into the factors affecting the uptake of application of e-procurement, within the UK public sector.
- Davis, F. D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, 13 (3),319-340, doi:10.2307/249008
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-339
- Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. (1989). "User acceptance of computer technology: A comparison of two theoretical models", *Management Science*,35, 982- 1003, doi:10.1287/mnsc.35.8.982.
- Domon, B. and Aebersold, R., (2010). Options and considerations when selecting a quantitative proteomics strategy. *Nature biotechnology*, 28(7), pp.710-721.

- Dubey, R., Gunasekaran, A., Childe, S. J., Papadopoulos, T., Hazen, B., Giannakis, M., and Roubaud, D. (2017). Examining the effect of external pressures and organizational culture on shaping performance measurement systems (PMS) for sustainability benchmarking: Some empirical findings. *International Journal of Production Economics*, 193, 63-76.
- Dunleavy, P., Margetts, H., Bastow, S., and Tinkler, J. (2005). New public management is dead-long live digital-era governance. *Journal of Public Administration Research and Theory*, 16(3), 467-494. <https://doi.org/10.1093/jop>.
- Duyshart, B., Walker, D., Mohamed, S., and Hampson, K. (2003). An example of developing a business model for information and communication technologies (ICT) adoption on construction projects—the National Museum of Australia project. *Engineering, Construction and Architectural Management*.
- Eadie, R. et al. (2012) 'E-readiness of construction contract forms and e-tendering software', *International Journal of Procurement Management*, 5(1), pp. 1-26.
- Edquist, C., and Zabala-Iturriagoitia, J. M. (2012). Public Procurement for Innovation as mission-oriented innovation policy. *Research policy*, 41(10), 1757-1769. <https://doi.org/10.1016/j.respol.2012.04.022>
- European Commission, (2015). Study on Strategic use of public procurement in promoting green, social and innovation policies, 2015, Available at: <http://ec.europa.eu/DocsRoom/documents/17261/attachments/1/translations/en/renditions/pdf>, [Accessed: 02 August 2021].
- Gall, M.D., Borg, W.R. and Gall, J.P., (2003). Educational research: An introduction. Longman Publishing.
- Galletta, D. F., Ahuja, M., Hartman, A., Teo, T., and Peace, A. G. (1995). Social Influence and enduser Training. *Communications of the ACM*, 38(7), 70-79.
- Ganesh, A. (2013). Positive correlation between employee attitude and human processes
- Glavee-Geo, R., 2008. *Public procurement reforms in Ghana: an evaluation of the implemented changes* (Master's thesis, Høgskolen i Molde).
- Gogtay, N.J. and Thatte, U.M., (2017). Principles of correlation analysis. *Journal of the Association of Physicians of India*, 65 (3), 78-81.
- Grandia, J., Steijn, B., & Kuipers, B. (2015). It is not easy being green: increasing sustainable public procurement behaviour. *Innovation: The European Journal of Social Science Research*, 28(3), 243-260. <https://doi.org/10.1080/13511610.2015.1024639>
- Gratton, C. and Jones, I., (2014). Research methods for sports studies.
- Gunasekaran, A., and Ngai, E.W.T. (2008). Adoption of e-procurement in Hong Kong: An empirical research. *International Journal of Production Economics*, 113, 159-175.
- Gunasekaran, A., McGaughey, R.E., Ngai, E.W.T. and Rai, B.K. (2009). E-Procurement Adoption in the Southcoast SMEs, *International Journal of Production Economics*, 122(1), 161-75.
- Hackett, M., Robinson, I. and Statham, G. (eds) (2007) *The Aqua Group Guide to Procurement, Tendering & Contract Administration*. Oxford: Blackwell Publishing.
- Hasmukhbhai, P. P. (2022). *A Study of e-Procurement Practices in Selected Organizations in Gujarat* (Doctoral dissertation, Faculty of Economics and Business (FEB), University of Maribor, Slovenia).
- Hasmukhbhai, P. P. (2017). *A Study of e-Procurement Practices in Selected Organizations in Gujarat* (Doctoral dissertation, Faculty of Economics and Business (FEB), University of Maribor, Slovenia).
- Hassan, S., Ansari, N., and Rehman, A. (2022). An exploratory study of workplace spirituality and employee well-being affecting public service motivation: an institutional perspective. *Qualitative Research Journal*, 22(2), 209-235.
- Hassim, M.H. and Hurme, M., (2010). Inherent occupational health assessment during process research and development stage. *Journal of Loss Prevention in the Process Industries*, Vol. 23 No. 1, pp.127-138

- Hawking, P., Stein, A., Wyld, D., and Foster, S. (2004). E-Procurement: Is the ugly duckling actually a swan down under? *Asia Pacific Journal of Marketing and Logistics*, 16 (1), 3–26.
- Hazriyanto, H., and Ibrahim, B. (2019). The factor analysis of organizational commitment, job satisfaction, and performance among lecturers in Batam. *Journal of Technical Education and Training*, 11(1).
- Henriksen, H. Z., & Mahnke, V. (2005). E-procurement adoption in the Danish public sector: The influence of economic and political rationality. *Scandinavian Journal of Information Systems*, 17(2), 2.
- Hsin C. (2013), "E-Procurement and supply chain performance", *Supply Chain Management: An International Journal*, 18(1), 34 – 51, last retrieved dated 07.08.2021 from Emerald Insight.
- Ibem, E. O. and Laryea, S. (2015) 'E-Procurement use in the South African construction industry', *Journal of Information Technology in Construction*, 20(January), pp. 364–384.
- Ibem, E. O., and Laryea, S. (2017). E-tendering in the South African construction industry. *International Journal of Construction Management*, 17(4), 310-328.
- Ibem, E.O., and Laryea S. (2015). E-procurement use in the South African construction industry. *Journal of Information Technology Construction*. 20, 364–384.
- Jeffers, P. (2010). "Embracing sustainability: information technology and the strategic leveraging of operations in third-party logistics", *International Journal of Operations and Production Management*, Vol. 30 No. 3, pp. 260-287
- Johnson, M. (2011). Public sector e-procurement: A study of benefits from e-markets in the local government sector. *International Journal of Services Technology and Management*, 16(1), 1-27.
- Kakwezi, P., and Nyeko, S. (2019). Procurement processes and performance: Efficiency and effectiveness of the procurement function. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, 3(1).
- Kamel. (2014). Sherif Kamel, ICT4D – Case of the Information Society in Africa. a proposed article submitted for review for possible publication. *Encyclopedia of Information Science and Technology*.
- Karjalainen, K. and van Raaij, E. (2015), "An empirical test of contributing factors to different forms of maverick buying", *Journal of Purchasing and Supply Management*, Vol. 17 No. 2, pp. 185-197.
- Karjalainen, K., Kempainen, K. and Van Raaij, E. (2009), "Non-compliant work behaviour in purchasing: an exploration of reasons behind maverick buying", *Journal of Business Ethics*, Vol. 85 No. 2, pp. 245-261.
- Ke, W., Liu, H., Wei, K. K., Gu, J., & Chen, H. (2009). How do mediated and non-mediated power affect electronic supply chain management system adoption? The mediating effects of trust and institutional pressures. *Decision Support Systems*, 46(4), 839-851.
- Khadimi, A.L. (2010). *A Performance Measurement Approach for Operational Control of E-procurement Chains*. MSc. Thesis. Eindhoven University of Technology. Uk.
- Kiage, J. O. (2013). Factors affecting procurement performance: A case of ministry of energy. *International journal of business and commerce*, 3(1), 54-70.
- Kidd, A. B. (2005). Procurement's Value: What Are We Really Measuring?
- Kierkegaard, S. M. (2006). Going, going, gone! E-procurement in the EU. *International Journal of Computing & Information Sciences*, 4(1), 30-39.
- [Kim, M.](#), [Suresh, N.C.](#) and [Kocabasoglu-Hillmer, C.](#) (2015), "A contextual analysis of the impact of strategic sourcing and E-procurement on performance", *Journal of Business & Industrial Marketing*, Vol. 30 No. 1, pp. 1-16. <https://doi.org/10.1108/JBIM-01-2012-0010>
- Kissi, E., Adjei-Kumi, T., Twum-Ampofo, S., and Debrah, C. (2020). Identifying the latent shortcomings in achieving value for money within the Ghanaian construction industry. *Journal of Public Procurement*.

- Kosilek, E. (2004). Elektronische Beschaffung in Kommunen - eine Modellbetrachtung am Beispiel deutscher Gemeinden, Brandsberg.
- Kottemann, J.E., and Boyer-Wright, K.M. (2010). Socioeconomic foundations enabling e-business and e-government. *Information Technology for Development*, 16(1), 4-15. <https://doi.org/10.1002/itdj.20131>
- Kristensen, H. S., Mosgaard, M. A., & Remmen, A. (2021). Circular public procurement practices in Danish municipalities. *Journal of Cleaner Production*, 281, 124962.
- Kuoribo, E., and Yomoah, R. (2020). *The Effect of Ethical and Unethical Behaviour on Project Performance in The Ghanaian Construction Industry (GCI)*. Published thesis. BSc. Kwame Nkrumah University of Science and Technology.
- Lakshmi, P. and Visalakshmi, S., (2013), "E-Procurement Praxis in Government Organizations", ISSN: 1694-2108 | 2(1).
- Laryea, S., and Ibem, E. O. (2014). Patterns of Technological Innovation in the use of e-Procurement in Construction. *Journal of information Technology in Construction*, 19, 104-125.
- Layne, K., & Lee, J. (2001). Developing fully functional E-government: A four stage model. *Government information quarterly*, 18(2), 122-136.
- Lewis-Faupel, S., Neggers, Y., Olken, B. and Pande, R. (2016), "Can electronic procurement improve infrastructure provision? Evidence from public works in India and Indonesia", *American Economic Journal: Economic Policy*, Vol. 8 No. 3, pp. 258-83.
- Liu, H., Ke, W., Wei, K. K., Gu, J., and Chen, H. (2010). The role of institutional pressures and organizational culture in the firm's intention to adopt internet-enabled supply chain management systems. *Journal of Operations Management*, 28(5), 372-384.
- Liu, J., Shi, B., Xue, J., and Wang, Q. (2019). Improving the green public procurement performance of Chinese local governments: From the perspective of officials' knowledge. *Journal of Purchasing and Supply Management*, 25(3), 100501.
- Locke, E.A., (2007). The case for inductive theory building. *Journal of Management*, 33(6), pp.867-890.
- Lou, E.W., Ashalwi M. 2009. Critical success factors for e-tendering implementation in construction collaborative environments: people and process issues. *Journal of Information Technology Construction*, 14, 98-109.
- Lukacs de Pereny Martens, S. G., and Schwarz, G. M. (2022). Examining Contemporary Australian Local Government Sustainable Procurement Practices: A National Study. *International Journal of Public Administration*, 1-17. <https://doi.org/10.1080/01900692.2022.2120002>
- Lysons, K., and Farrington, B. (2010). *Purchasing and Supply Chain Management* 7th ed. London: Prentice-Hall.
- Mambo P., et al., (2015), "Factors Influencing Implementation of E-Procurement in the National Government: A Case of the Ministry of Interior and Co-Ordination of National Government", 2 (46), 951-999.
- Marnisah, L., Zamzam, F., Handayani, S., Yustini, T., Wijaya, H., Maris, H., and Irwanto, D. (2021). Factors affecting e-procurement division employee performance. *International Journal of Data and Network Science*, 5(1), 19-24.
- Martini, I. A. O., Rahyuda, I. K., Sintaasih, D. K., & Piartrini, P. S. (2018). The influence of competency on employee performance through organizational commitment dimension. *Iosr Journal Of Business And Management (Iosr-Jbm)*, 20(2), 29-37.
- Masudin, I., Aprilia, G. D., Nugraha, A., and Restuputri, D. P. (2021a). Impact of E-procurement adoption on company performance: Evidence from Indonesian manufacturing industry. *Logistics*, 5(1), 16.
- Masudin, I., Aprilia, G. D., Nugraha, A., and Restuputri, D. P. (2021b). Impact of E-procurement adoption on company performance: Evidence from Indonesian manufacturing industry. *Logistics*, 5(1), 16.

- McConnell, D. J. (2009). *An analysis into the factors affecting the uptake of applications of e-procurement, within the UK public sector* (Doctoral dissertation, Loughborough University).
- Mildner, V. (2019). Experimental Research. In the SAGE Encyclopedia of Human Communication Sciences and Disorders. SAGE Publications, Inc.
- Mitra, S. (2005). Information Technology as an Enabler of Growth in Firms: An Empirical Assessment. *The Journal of Management Information Systems*, 22(2), 279-300.
- Mohd Nawi, M.N., Roslan, S., Salleh, N.A., Zulhumadi, F., and Harun, A.N. (2016). The benefits and challenges of E-procurement implementation: A case study of Malaysian Company. *International Journal of Economics and Financial Issues*, 6(S7), 329-332.
- Morris, A., Stahl, A., and Herbert, R. (2000). E-procurement: streaming processes to Maximize Effectiveness. Luminant Worldwide Corporation, USA.
- Mose, J. M., Njihia, J. M. and Magutu, P. O. (2013) 'E-Procurement Adoption Among Large Scale Manufacturing Firms in Nairobi , Kenya', *European Scientific Journal*, 9(13), pp. 375–401.
- Mose, J.M, (2013). The critical success factors and challenges in e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya. *European Scientific Journal* [online]. 9(13). Available at: <https://eujournal.org/index.php/esj/article/view/1060> [Accessed on 06/08/2021].
- Muijs, D. (2010). *Doing quantitative research in education with SPSS*. Sage.
- Murtagh, B. (2009). Accessibility, Urban Design and the Whole Journey Environment. *Built Environment*, 35(3), 366-385. DOI: <https://doi.org/10.2148/benv.35.3.366>
- Nair, S. R.(2006), *Organizational Behaviour (Text and Cases)*, Mumbai: Himalaya Publishing House.
- Naoum, S.G., (2012). *Dissertation research and writing for construction students*. Routledge.
- Neupane, A., Soar, J., and Vaidya, K. (2014). An empirical evaluation of the potential of public E-procurement to reduce corruption. *Australasian Journal of Information Systems*, 18(2), 21–44. <https://doi.org/10.3127/ajis.v18i2.780>.
- Ngari, J. M. K., Richu, S., & Mbeche, W. N. (2014). Employees' Level of E-Procurement Skills as a Challenge Facing the Implémentations of Electronic Procurement System at Nakuru Water & Sanitation Services Ltd, Nakuru, Kenya.
- Nola, R. and Sankey, H., (2014). *Theories of scientific method: an introduction*. Routledge.
- Ogwel, TS., Iravo, M.I.K.E., and Lagat, K.M. (2016). Factors Influencing Performance of Public Procurement Function in Trans-Nzoia County, Kenya. *International Journal of Recent Research in Commerce Economics and Management (IJRRCEM)*, 3(2), 95-106.
- Okakpu, A., GhaffarianHoseini, A., Tookey, J., Haar, J., Ghaffarianhoseini, A. and Rehman, A., (2018). A proposed framework to investigate effective BIM adoption for refurbishment of building projects. *Architectural Science Review*, 61(6), pp.467-479.
- Oppenheim, A. (2003). "Questionnaire Design, Interviewing and Attitude Measurement", Pinter, London.
- Oppong, W. A. (2020). Assessing the Effectiveness of the Procurement Acts in Public Financial Administration in Ghana. *African Journal of Procurement, logistics & Supply Chain Management*. 2(4), 1-18.
- Ordanini, A. and Rubera, G. (2008), "Strategic capabilities and internet resources in procurement", *International Journal of Operations and Production Management*, Vol. 28 No. 1, pp. 27-52.
- Osei-Tutu, S. (2016). *Compliance with Post Contract Procurement Procedures at Kumasi Metropolitan Assembly* (Doctoral dissertation).
- Owusu-Manu, D. G., Edwards, D. J., Kukah, A. S., Parn, E. A., El-Gohary, H., and Hosseini, M. R. (2018). An empirical examination of moral hazards and adverse selection on PPP projects. *Journal of Engineering, Design and Technology*.
- Owusu-Manu, D.G., Debrah, C., Antwi-Afari, P. and Edwards, D.J., (2019), July. Barriers of Project Bond Initiatives in Infrastructure Financing in Ghana. In *Construction Industry Development Board Postgraduate Research Conference* (pp. 12-21). Springer, Cham.

- Oyediran, O.S, and Akintola, A.A. (2011). A survey of the state of the art of e-tendering in Nigeria. *Journal of Information Technology Construction*, 32, 1–20.
- Oyegoke, A. S., McDermott, P. and Abbott, C. (2009) ‘Achieving sustainability in construction through the specialist task organisation procurement approach’, *International Journal of Procurement Management*, 2(3), pp. 288–313.
- Panayiotou, N.A., Gayialis, S.P. and Tatsiopoulos, I.P.I.P. (2004). An E-procurement System for Governmental Purchasing, *International Journal of Production Economics*, 90(1), 79-102.
- Pandey, P. and Pandey, M.M., (2015). Research methodology: Tools and techniques. Romania: Bridge Center.
- Pandey, P., and Pandey, M. M. (2015). Research methodology: Tools and techniques. Romania: Bridge Center.
- Parkes, S.D., Marsden, G., Shaheen, S.A., and Cohen, A.P. (2013). Understanding the diffusion of public bikesharing systems: evidence from Europe and North America. *Journal of Transport Geography*, 31, 94-103.
- Paulo, A. (2009). Electronic Procurement: Dealing With Supplier Adoption, Lisbon University Institute.
- Pavel, J. and Kubik, R. (2011). “Impact of e-auctions on public procurement effectiveness”, in Proceedings of the 2nd International Conference on Innovation, Management and Service, Singapore, 16-18 September 2011.
- Premathilaka, K.M., and Fernando, R.L.S. (2020). Critical success factors affecting e-procurement adoption in public sector organizations in Sri Lanka. *Vidyodaya Journal of Management*, 6(2).
- Pricewaterhousecoopers, (2013). E-Procurement Golden Book of Good Practice, Final Report, p.8. Available at: http://ec.europa.eu/internal_market/pub_licprocurement/e-procurement/golden-book/docs/e-procurement_golden_book_of_good_practice.pdf, [Accessed: 02 August 2021].
- Public Procurement Authority (2007). The Role of Procurement and Legal Framework, Accra, Ghana.
- Queenan, C., Angst, C. and Devaraj, S. (2011), “Doctors’ orders – If they’re electronic, do they improve patient satisfaction? A complements/substitutes perspective”, *Journal of Operations Management*, Vol. 29 No. 7-8, pp. 639-649.
- Rahim, M. M. (2008). Identifying factors affecting acceptance of e-procurement systems: An initial qualitative study at an Australian City Council. *Communications of the IBIMA*, 3(1), 7-17.
- Rahim, M. M. (2008). Identifying factors affecting acceptance of e-procurement systems: An initial qualitative study at an Australian City Council. *Communications of the IBIMA*, 3(1), 7-17.
- Rai, A. and Hornyak, R. (2013). “The impact of sourcing enterprise system use and work process interdependence on sourcing professionals’ job outcomes”. *Journal of Operations Management*, Vol. 31 No. 6, pp. 474-488
- Raj, A., Agrahari, A., and Srivastava, S. K. (2020). Do pressures foster sustainable public procurement? An empirical investigation comparing developed and developing economies. *Journal of cleaner production*, 266, 122055. <https://doi.org/10.1016/j.jclepro.2020.122055>
- Rajasekar, S., Philominathan, P. and Chinnathambi, V., (2013). Research Methodology, 1–53
- Robinson, L. (2009). A summary of diffusion of innovations. *Enabling change*, 5(10).
- Robinson, P., Wale, D., and Dickson, G. (2010). *Events management*. Cambridge, MA: CABI.
- Rogers, E.M. (1962). Diffusion of Innovations the Free Press of Glencoe. NY, 32, 891-937.
- Rolstadas, A., Hetland, P.W., Jergeas, G.F., and Westney, R.E. (2011). *Risk Navigation Strategies for Major Capital Projects: Beyond the Myth of Predictability*. London, NY:Springer.
- Ronchi, S., Brun, A., Golini, R. and Fan, X. (2010). What is the Value of an IT Eprocurement System? *Journal of Purchasing & Supply Management*, 16(2), 131-140.
- Ruparathna, R., & Hewage, K. (2015). Review of contemporary construction procurement practices. *Journal of management in engineering*, 31(3), 04014038.

- Sabari R.P. et al., (2012), "Green Purchasing Practices: A study of E-Procurement in B2B Buying in Indian Small and Medium Enterprises", *Journal of Supply Chain and Operations Management*, 10(1). Retrieved from http://www.procurementobservatoryraj.in/PhaseI/pdf/Green_Purchasing_Practices_A_study_of_e-procurement.pdf. [Accessed on 06/10/2022].
- Santoso, D.S. and Bourpanus, N. (2019), "Moving to e-bidding: Examining the changes in the bidding process and the bid mark-up decisions of Thai contractors", *Journal of Financial Management of Property and Construction*, 24(1), pp. 2-18. <https://doi.org/10.1108/JFMPC-05-2018-0025>
- Sanyal, M.K. and Guha, A. (2010). "E-Procurement Initiative in Indian Industry: A Case Study", *Global Vistas*, Volume-9 July 2010 pp 1-40.
- Saunders, M., Lewis, P. and Thornhill, A., (2009). *Research methods for business students*. Essex: Prentice Hall: Financial Times.
- Schmitz, U. (2021). E-Contracting. In *Grundkurs Electronic Business* (pp. 215-222). Springer Vieweg, Wiesbaden.
- Schrank, D., Eisele, B., Lomax, T. and Bak, J., (2015). urban mobility scorecard.
- Seow, C., Sarkis, J., Lockström, M., and Callarman, T. (2014). "Responsible Purchasing and Supply Practices". *Decision Sciences*, 45(4), 571-576.
- Setyowati, W., Widayanti, R., and Supriyanti, D. (2021). Implementation Of E-Business Information System In Indonesia: Prospects And Challenges. *International Journal of Cyber and IT Service Management*, 1(2), 180-188.
- Shiv Khara, (2011), *You Can Win*, MacMillan Publishers, Delhi.
- Singh, G., Pathak, R., Naz, R. and Belwal, R. (2010). E-governance for Improved Public Sector Service Delivery in India, Ethiopia and Fiji, *International Journal of Public Sector Management*, 23(3) 254-275.
- Singh, I. and Kumar P.D. (2011). Employees Adoption of E-Procurement System: An Empirical Study. *International Journal of Managing Information Technology (IJMIT)* Vol.3, No.4, November 2011, Available at SSRN: <https://ssrn.com/abstract=3855272>
- Singh, I., and Punia, D. K. (2011). Employees adoption of e-procurement system: an empirical study. *arXiv preprint arXiv:1112.2699*. <https://doi.org/10.48550/arXiv.1112.2699>
- Smart, A. (2010) 'Exploring the business case for e-procurement', *International Journal of Physical Distribution & Logistics Management*, 40(3), pp. 181-201.
- Smith, A. D. (2009) 'The impact of e-procurement systems on customer relationship management: A multiple case study', *International Journal of Procurement Management*, 2(3), pp. 314-338.
- Soudry, O. (2010). *A Principal-Agent Analysis of Accountability in Public Procurement., Advancing Public Procurement Experiences and Knowledge Sharing*, Boca Raton, FL, USA: PR Academics Press, 432-451.
- Spiller, P.T. (2008). *An Institutional Theory of Public Contracts: Regulatory Implications: National Bureau of Economic Research*.
- Straub, E. T. (2009). Understanding Technology Adoption: Theory and Future Directions for Informal. *Review of Educational Research*, 79(2), 625-649.
- Suleman, M.A. (2013). *Adoption Of E-Procurement and Value Addition to Tanzanian Public Institutions A Case of Tanzania Public Institutions*. MSc. Thesis. Mzumbe University.
- Suliantoro, H., Ghozali, I., and Wibowo, M. A. (2015). E-procurement adoption in government institution: Predicting social values effect on intention and usage behavior of e-procurement. *International Journal of Business and Society*, 16(2).
- Sundarraaj, R.P and Kumari, K., (2013), "Electronic Procurement Systems in India: Importance and Impact on Supply Chain Operations", Springer Science Business Media New York. Last retrieved from file:///D:/Downloads/9781441961310- c2.pdf. [Accessed on 06/08/2021].
- Syamsudin, A. and Janssen, P. (2016), "Anti-corruption campaigns get an e-boost in Indonesia, Thailand", *Asia Insight*, MNI News, available at: <https://asiainsight.mni->

- news.com/posts/anticorruption-campaigns-get-an-e-boost-in-indonesia-thailand-1763 (accessed 06 October 2022).
- Tavares, L. V. (2008). The Management of Public Procurement. *Guide to Application of the Code of Public Contracts Decree-Law*, 18.
- Taylor, Y. and Wright, N. L. (2018). The future of public procurement in the era of digitalization, 23 July 2018, Available at: <http://blogs.worldbank.org/governance/future-public-procurement-era-digitalization>, [Accessed: 02 August 2021]
- Teo, T.S.H., Lin, S.J. and Lai, K.H. (2009). Adopters and Non-adopters of E-procurement in Singapore: An Empirical Study, *Omega*, 37(5) 972-987.
- Tetteh, E., (2014). Causes and Effects of Delays in Procurement of Works at Pre-tender Stage in Upper Denkyira East Municipal Assembly. Master's thesis. Kwame Nkrumah university of science and technology, Kumasi, Ghana.
- Thai, K. V. (2001). Public procurement re-examined. *Journal of public procurement*. The Ministry of Roads and Highways". www.mrt.gov.gh. Archived from [the original](#) on 21 July 2011. [Accessed: 1st August 2021].
- Tindsley, G., and Stephenson, P. (2008). E-tendering process within construction: a UK perspective. *Tsinghua Sci Technol*. 13, 273-278.
- Tornatzky, L. G., Fleischer, M., and Chakrabarti, A. K. (1990). *The processes of technological innovation*. Lexington, MA.: Lexington Books.
- Trochim, W.M. and Donnelly, J.P., (2006). Research methods knowledge base (Vol. 2). Cincinnati, OH: Atomic Dog Publishing.s
- Tutu, S. O., Kissi, E., Osei-Tutu, E., & Desmond, A. (2019). Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, 12(1), 1-14.
- Tutu, S. O., Kissi, E., Osei-Tutu, E., and Desmond, A. (2019). Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, 12(1), 1-14. <https://doi.org/10.1504/IJPM.2019.096994>.
- United Nation Development Programme (UNDP). (2006). Capacity development practice note, viewed 15 July 2011, <http://capacity.undp.org/index.cfm?module=Library&page=Document&DovumentID=5599>. (Accessed 02/10/2022)
- United Nations Department of Economic and Social Affairs (UNDESA). (2014). United Nations E-Government Survey 2014: E-Government for the future we want. United Nations.
- Uyarra, E., and Flanagan, K. (2010). Understanding the innovation impacts of public procurement. *European planning studies*, 18(1), 123-143.
- Vaidya, K, et al., (2006). Critical factors that influence e-procurement implementation success in the public sector, *Journal of public procurement* [online]. 6, pp.70-99. Available at: <http://pracademics.com/attachments/article/444/eProSympAr6%20Vaidya%20etal.pdf> (Accessed on 06/08/2021)
- Vaidya, K., & Campbell, J. (2016). Multidisciplinary approach to defining public e-procurement and evaluating its impact on procurement efficiency. *Information Systems Frontiers*, 18(2), 333-348. <https://doi.org/10.1007/s10796-014-9536-z>
- Vaidya, K., Sajeev, A. S. M., & Callender, G. (2006). Critical factors that influence e-procurement implementation success in the public sector. *Journal of public procurement*.
- Van Weele, A., Lakemond, N., Claessens, F., (2003). E-Procurement: Feit of Fictie?. *Management & Informatie*.
- Veel, C. and Skitmore, R. M. (2003) 'Professional ethics in the construction industry', *Engineering Construction and Architectural Management*, 10(2), pp. 117-127.
- Wang, W., Zhang, S., Su, Y., and Deng, X. (2019). An Empirical Analysis of the Factors Affecting the Adoption and Diffusion of GBTS in the Construction Market. *Sustainability*, 11(6), 1795.
- Wen, W. and Wei, L. (2007) Decision-making Analysis of E-procurement with the Rough Set Theory, International Conference on Wireless Communications, Networking and Mobile Computing, Shanghai, 21-25 September.

- Wharrad H. and Silcocks P. (2009). An Introduction to Experimental Design. The NIHR RDS EM / YH.
- Wijaya, O. (2022). The effect of digital procurement and supply chain innovation on SMEs performance. *International Journal of Data and Network Science*, 6(4), 1625-1630.
- Wirtz, B., Lütje, S., and Schierz, P. G. (2009). An empirical analysis of the acceptance of e-procurement in the German public sector. *International Journal of Public Administration*, 33(1), 26-42. <https://doi.org/10.1080/01900690903188768>.
- World Bank. (2012). Why reform public procurement? Washington DC, USA.
- World Bank. (2013). Ghana 2003 Country Procurement Assessment Report. Washington, DC: Ghana Country Department.
- World Bank. (2016). Benchmarking public procurement 2017: Assessing public procurement regulatory systems in 180 economies. The World Bank
- Yusof, (2010). Factors that influence the satisfaction level of e-procurement users: a moderating effect of transparency (online), from <http://eprints.usm.my/23738/1/KHAIRUSANY.pdf>. [Accessed: 1st August 2021].
- Zhang, L., Lee, M.K.O., Zhang, Z. And Banerjee, P. (2003) “Critical success factors of enterprise resource planning systems implementation success in China”, In the proceedings of the Hawaii International Conference on Systems Science (HICSS).
- Zuo, P.X.W and Seo, Y. (2006). Effective Applications of E-Commerce Technologies in Construction Supply Chain: Current Practice and Future Improvement. *Journal of Information Technology in Construction*, 11,127-147.

