

## THE ROLE OF PERSONNEL INTEGRITY IN MEDIATING THE RELATIONSHIP BETWEEN E-PROCUREMENT ADOPTION AND ACCOUNTABILITY AMONG PUBLIC SECTOR ORGANISATIONS

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### ABSTRACT

This study investigates the mediating role of personnel integrity in the relationship between e-procurement adoption and accountability in Ghana's public sector organizations, utilizing the Technology-Organization-Environment (TOE) framework. E-procurement systems, such as the Ghana Electronic Procurement System (GHANEPS), aim to enhance transparency and reduce corruption in public procurement. However, their effectiveness is often influenced by human factors, particularly the integrity of personnel managing these systems. Using a quantitative approach, data were collected from 172 procurement officers, managers, and staff across 20 Metropolitan, Municipal, and District Assemblies (MMDAs) through the use of structured questionnaires. The analysis, conducted via Smart PLS, confirmed that e-procurement adoption significantly enhances accountability ( $\beta = 0.163$ ,  $p = 0.014$ ) and personnel integrity ( $\beta = 0.412$ ,  $p < 0.001$ ). Personnel integrity has a strong influence on accountability ( $\beta = 0.716$ ,  $p < 0.001$ ) and significantly mediates the relationship between e-procurement and accountability ( $\beta = 0.295$ ,  $p < 0.001$ ), explaining 63.5% of the variance in accountability outcomes. These findings suggest that while e-procurement fosters transparency, its impact on accountability is amplified by the presence of ethical behavior among personnel. The study highlights the importance of integrity-focused training and robust anti-corruption policies in complementing technological reforms. Despite limitations, such as its cross-sectional design and reliance on self-reported data, the results contribute to the literature on digital governance and offer policymakers

### 1.0 INTRODUCTION

The growing emphasis on efficiency, transparency, and accountability in public sector management has intensified global discussions on mechanisms that enhance integrity and performance, particularly within procurement systems (Adam, 2024). Public procurement remains one of the most critical government functions because it involves substantial public resources, yet it is equally one of the most vulnerable to inefficiency, corruption, and mismanagement (Dza et al., 2018). In response, many governments have adopted digital transformation initiatives, including electronic procurement (e-procurement), as a strategic reform to promote integrity and improve performance. E-procurement has been recognized as

a technological innovation that enhances transparency, minimizes corruption, and strengthens accountability in public service delivery (Neupane et al., 2012). In developing countries such as Ghana, the introduction of the Ghana Electronic Procurement System (GHANEPS) represents a cornerstone of public sector reform, intended to rebuild public trust and ensure prudent use of limited public resources (Adjei-Bamfo et al., 2020). However, the extent to which e-procurement achieves these accountability outcomes depends not only on the technology itself but also on the ethical conduct and integrity of the personnel who implement and manage it (Shava & Heystek, 2021; Dza et al., 2015). E-procurement has transformed procurement processes by automating repetitive tasks, minimizing discretion, and establishing verifiable audit trails that enhance transparency and compliance. As Basheka (2017) explains, automation reduces face-to-face interactions, standardizes procedures, and strengthens adherence to procurement regulations, thereby curbing opportunities for corrupt behavior. Empirical evidence similarly suggests that e-procurement can reduce transaction costs, accelerate procurement cycles, and promote competition and fairness among suppliers (Fazekas & Blum, 2021; Fernandes & Vieira, 2015).

In Ghana, the Public Procurement Authority (PPA) introduced GHANEPS to strengthen procurement integrity and operational efficiency across ministries, departments, and agencies (Musah et al., 2025). Despite these reforms, implementation challenges persist, often rooted in personnel ethics, competence, and organizational culture (Dza, 2017; Mohungoo et al., 2020). While technology may limit discretionary decisions, it cannot replace ethical integrity. Thus, as Maina (2023) and Acquah et al. (2025) observe, the success of e-procurement systems is contingent upon the moral and professional responsibility of the individuals operating them. The persistence of procurement-related corruption despite digital reforms highlights a critical gap in understanding how personnel integrity shapes accountability outcomes. Although e-procurement is designed to improve accountability, empirical findings from developing contexts show mixed results (Ameyaw et al., 2012). In several cases, advanced procurement platforms coexist with bribery, favoritism, and fraudulent contracting (Dza et al., 2015).

This raises important questions about whether deficiencies in personnel integrity undermine the accountability benefits of e-procurement reforms. In Ghana, for example, the Commission on Human Rights and Administrative Justice (CHRAJ) reported in 2022 that procurement-related irregularities accounted for over 30% of corruption cases in the public sector (Kuyini, 2023). Such evidence indicates that technological systems enhance monitoring and documentation but cannot ensure accountability without personnel who demonstrate honesty, ethical judgment, and adherence to professional standards. Weak integrity among procurement personnel has profound implications for governance and development. When ethical standards are compromised, public resources are misused, inefficiencies persist, and citizens' trust in government erodes (Farazmand et al., 2022). Moreover, as Shava and Heystek (2021) caution, technology can be misused to conceal corruption rather than prevent it. In Ghana and other developing contexts, lapses in personnel integrity have led to procurement malpractice, inflated contracts, and noncompliance with procurement regulations (Kumasey, 2017; Dza, 2017). These issues undermine institutional credibility and divert resources away from essential services, constraining socio-economic development. Although the technical and procedural benefits of e-procurement are well documented, the ethical and behavioral dimensions that determine its success remain underexplored. Most existing research emphasizes institutional, regulatory, and technical factors influencing e-procurement performance (Basheka, 2017), with

limited attention to how personnel integrity shapes accountability outcomes. Integrity, as a core aspect of public sector ethics, is central to achieving good governance and sustainable accountability (Endenich & Trapp, 2020). Yet, in much of the existing literature, it is treated as a peripheral issue rather than a fundamental determinant. This theoretical and empirical gap restricts understanding of how technological reforms can integrate ethical behavior to achieve long-term governance improvements. As Afful (2023) and Dza et al. (2018) argue, sustainable procurement outcomes depend not only on formal regulation but also on ethical compliance and staff professionalism. Despite ongoing reforms, public sector organizations across Africa including Ghana continue to grapple with inefficiency, opaque transactions, and corruption, which weaken institutional accountability. E-procurement was expected to mitigate these challenges through automation and enhanced transparency (Dza, 2017; Aduwo et al., 2020). However, poor implementation, low digital competence, and weak integrity among personnel have limited its effectiveness. In Ghana, persistent irregularities such as collusion, bid rigging, and conflicts of interest continue even under digital systems (Musah et al., 2025). These realities underscore that technological interventions alone cannot achieve accountability without robust ethical standards and professional procurement practices (Dza et al., 2015). The consequences of weak accountability in procurement extend beyond administrative inefficiency. Transparency International (2021) estimates that corruption and procurement-related inefficiencies contribute to 20–30% of public expenditure losses in some African countries. In Ghana, the Auditor-General's Reports (2022) continue to highlight procurement breaches that cause substantial financial losses to the state. Such issues constrain development by diverting funds from essential sectors like education, health, and infrastructure, while eroding investor and donor confidence (Ameyaw & Mensah, 2018). As Dza et al. (2018) note, procurement malpractice in Ghana often reflects weak institutional integrity and normalized unethical conduct within public systems. Understanding the human and ethical factors influencing e-procurement effectiveness is therefore critical to improving governance outcomes.

While research in developed contexts demonstrates that e-procurement enhances transparency through strict enforcement of ethical codes and automated oversight (Neupane et al., 2014), African studies tend to emphasize infrastructural and behavioral barriers such as low digital literacy and resistance to change (Munyao & Moronge, 2018). In Ghana, studies have explored e-procurement's potential to curb corruption but have rarely examined the mediating role of personnel integrity (Ofori & Adjei, 2020).

This study, therefore, investigates how personnel integrity mediates the relationship between e-procurement adoption and accountability in Ghana's public sector. Drawing on recent empirical insights from digital governance and ethical leadership research in Ghanaian public institutions (Agbemafle et al., 2024), the study contributes to understanding how technological and ethical dimensions interact to promote accountability in public procurement systems.

## 2.0 THEORETICAL REVIEW

The theoretical foundation for this study is rooted in the Technology–Organization–Environment (TOE) framework, developed by Tornatzky and Fleischer (1990). The TOE framework is widely recognized for its comprehensive approach to explaining how organizations adopt and implement technological innovations. It posits that the success of

technology adoption is determined by three interrelated dimensions technological, organizational, and environmental contexts that collectively influence implementation outcomes (Awa et al., 2017). The technological context encompasses the internal and external technologies relevant to an organization, including perceived benefits, complexity, and compatibility of innovation. The organizational context captures factors such as structure, management support, communication systems, and employee competence, which shape internal readiness for adoption. The environmental context refers to external forces such as government regulations, market dynamics, and societal expectations that influence technological decisions. Together, these three domains provide an integrative framework for understanding how and to what extent innovations like e-procurement are successfully implemented in public institutions.

The TOE framework is particularly relevant to this study because it captures the interplay between technology adoption and organizational behavior, aligning closely with the study's aim to examine how personnel integrity mediates the relationship between e-procurement adoption and accountability in the public sector. Within this framework, e-procurement fits within the technological domain as an innovation designed to enhance efficiency, transparency, and compliance in procurement systems. Personnel integrity, on the other hand, represents a core aspect of the organizational domain, reflecting the ethical behavior, professional conduct, and value orientation of individuals within the institution. Meanwhile, external factors such as anti-corruption policies, legal mandates, and donor requirements are captured within the environmental domain, shaping the institutional pressures that drive or constrain adoption (Aboelimged, 2010; Vaidya et al., 2009). This multidimensional structure allows for a more nuanced understanding of how both technological and ethical factors interact to influence accountability outcomes in public procurement systems.

The TOE framework also provides a strong basis for explaining the mediating role of personnel integrity in the relationship between e-procurement and accountability. While e-procurement technologies have the capacity to improve transparency and limit human discretion, their effectiveness depends largely on the ethical standards of the personnel who operate them. In this sense, personnel integrity functions as the behavioral link that translates technological potential into accountable practices. For instance, in Ghana's public sector, systems such as the Ghana Electronic Procurement System (GHANEPS) have been introduced to strengthen procurement transparency; however, their effectiveness depends on the honesty, professionalism, and ethical disposition of procurement officers (Basheka, 2017; Khorana et al., 2024; Issah et al., 2024). Thus, the TOE framework's organizational dimension must be interpreted not only in terms of managerial capacity or structural readiness but also in terms of the ethical orientation of personnel who influence how technology is used in practice.

This perspective extends the TOE framework beyond its traditional focus by explicitly incorporating ethical and behavioral dimensions into the organizational domain. While Tornatzky and Fleischer (1990) conceptualized organizational readiness largely in structural and managerial terms, this study broadens the scope to include the moral and professional integrity of employees as critical components of organizational capability. Integrity serves as a behavioral resource that determines whether technology-driven reforms yield their intended accountability outcomes. For example, when procurement personnel demonstrate honesty and adhere to professional standards, e-procurement systems are more likely to foster transparency

and compliance. Conversely, when integrity is weak, technology can be manipulated to conceal rather than prevent corruption. Therefore, personnel integrity strengthens the internal environment through which technology achieves accountability outcomes.

Although other theoretical models, such as the Technology Acceptance Model (TAM) and Virtue Ethics Theory, offer valuable insights, they are less comprehensive for this study's objectives. TAM focuses primarily on individual perceptions of usefulness and ease of use (Davis, 1989), overlooking organizational and environmental influences that are central to public sector contexts. Similarly, Virtue Ethics emphasizes moral character and personal values (Evans et al., 2020), which, although relevant to understanding integrity, do not account for institutional or technological factors that shape ethical conduct. The TOE framework, by contrast, integrates these dimensions—offering a holistic approach that captures the technical, ethical, and environmental factors influencing accountability in e-procurement. It enables a deeper understanding of how technology and ethics co-evolve within complex institutional environments such as Ghana's public sector.

Empirical research supports the suitability of the TOE framework for studying e-procurement systems. For example, Aboelmegeed (2010) demonstrated that organizational support and staff capability were key determinants of e-procurement success in Egypt's public sector. Similarly, Vaidya et al. (2009) found that trust and stakeholder engagement attributes related to organizational integrity were essential for effective e-procurement outcomes. In Ghana, Adebayo and Evans (2015) revealed that institutional culture and external governance pressures strongly influenced both the adoption and accountability outcomes of digital procurement reforms. These findings collectively affirm that accountability in public procurement emerges from the dynamic interaction of technology, ethics, and institutional conditions all core dimensions of the TOE framework.

This study contributes to the theoretical development of the TOE framework by incorporating personnel integrity as a mediating construct within the organizational domain a dimension that has been underexplored in prior applications. By doing so, the study advances a more comprehensive understanding of the human and ethical dynamics of technology adoption in governance contexts. This refined framework not only enhances theoretical clarity on the link between e-procurement and accountability but also provides practical guidance for policymakers and institutional leaders seeking to strengthen accountability through digital transformation. Ultimately, the TOE framework—enriched by the inclusion of ethical and integrity considerations—offers a robust foundation for explaining how technological, organizational, and environmental factors interact to produce accountable and transparent procurement systems in the public sector.

### **3.0 EMPIRICAL REVIEW AND HYPOTHESIS DEVELOPMENT**

#### **3.1 E-procurement adoption and Accountability**

Batenburg (2007) examined patterns of e-procurement adoption across European firms using quantitative analysis of the EU e-Business Watch 2003 survey; regression results showed extensive cross-country and sectoral variation, with firm size, perceived benefits, and national context explaining adoption differences; implications included that public e-procurement roll-

outs must account for organizational and national readiness (Batenburg, 2007). Costa et al. (2013) investigated the Portuguese mandatory public e-procurement rollout through two national surveys of contracting authorities and suppliers and comparative descriptive analysis; they found efficiency and transparency gains where systems were fully implemented, but also reported uneven impacts, new supplier costs, and the need for training and institutional support to realize accountability benefits (Costa et al., 2013).

Neupane et al. (2014) empirically evaluated the potential of public e-procurement technologies to reduce corruption by reviewing risk points in procurement stages and testing relationships using case evidence; they concluded that e-procurement reduces specific corruption opportunities (information asymmetry, discretionary contact) but its anti-corruption effect depends on which stages are digitized and on complementary controls and oversight. Fazekas and Blum (2021) produced a systematic policy review of public procurement reforms (including e-procurement and open contracting) and synthesized international evidence; using evidence synthesis methods they found mixed results; digitization can improve transparency, competition and value for money, but effects are conditional on full life-cycle coverage, data quality, enforcement and institutional capacity (Fazekas & Blum, 2021).

Basheka (2009) explored procurement corruption and service delivery in Uganda through empirical surveys and analysis of procurement practices; results highlighted organizational, political, and capacity drivers of procurement corruption and argued that ICT tools alone (including e-procurement) will not eliminate corruption unless professionalization, enforcement, and ethical norms are strengthened (Basheka, 2009). Ameyaw et al. (2012) analysed implementation bottlenecks in Ghana's Public Procurement Law (Act 663) using mixed methods (literature review, questionnaires and interviews across assemblies); they found weak enforcement, limited local capacity, political interference and resource constraints hindered reform outcomes and recommended capacity building and stronger oversight to make e-procurement effective for accountability (Ameyaw et al., 2012).

Ofori et al. (2023) studied adoption intentions for electronic procurement among Ghanaian public sector organisations using a survey and structural equation modelling (TAM-based); they found perceived usefulness, facilitating conditions, and organizational readiness strongly predicted adoption intentions and argued that mandates must be paired with training and institutional readiness to translate adoption into accountability improvements (Ofori et al., 2023). Owusu et al. (2021) examined corruption dynamics in urban infrastructure procurement (including Ghanaian cases) using expert surveys, social-network analysis, and system-dynamics modelling; they found contract and post-contract stages were most impacted by corruption and that layered anti-corruption measures are required to improve accountability measurably (Owusu et al., 2021). Munyao and Moronge (2018) investigated the influence of e-procurement practices on procurement performance in Kenyan public universities using a descriptive survey design; findings suggested e-tendering, e-ordering, and related practices improved procurement performance where infrastructure, user training, and management commitment existed, implying accountability gains depend on complementary capacity factors (Munyao & Moronge, 2018).

Molepo and Jahed (2022) analysed e-procurement as a monitoring tool against corruption in South Africa through case studies and document analysis; they reported improved traceability

and reduced face-to-face discretion but noted corruption risks shifted to specification setting and contractor selection unless data quality, oversight, and post-award controls were strengthened (Molepo & Jahed, 2022). Mavidis (2022) reviewed the evolution of e-procurement (3.0 to 4.0) and identified critical success factors using cross-country evidence and secondary analysis; the study argued that advanced e-procurement (integrated, data-rich, AI-enabled) can enhance accountability but only when governance, legal frameworks, and skilled personnel accompany technology (Mavidis, 2022). Lyra et al. (2022) conducted a systematic review of data-driven methods to detect fraud, corruption, and collusion in public procurement; using bibliometric and content analysis, they showed that digital procurement datasets enable novel detection techniques but stressed that without transparent platforms and institutional follow-through, these tools improve detection but not necessarily accountability outcomes (Lyra et al., 2022). Based on these empirical observations, we hypothesize that;

**H1:** E-procurement adoption has a significant effect on Accountability

### 3.2 E-procurement and personnel integrity

In their study, Coviello et al. (2020) aimed to evaluate whether e-procurement platforms in Italian public administration reduce corruption opportunities by enhancing transparency and accountability in tender processes. The researchers employed a mixed-methods approach, using a quasi-experimental design to compare pre- and post-e-procurement data from 150 municipalities between 2010 and 2018, complemented by semi-structured interviews with 50 procurement officers to assess perceived changes in integrity. Their findings indicated a 28% reduction in reported corruption incidents following implementation, driven by automated bidding and real-time auditing; however, digital literacy gaps among personnel slightly limited the system's effectiveness.

Gallego and Rivero (2021) examined the effectiveness of e-procurement in enhancing anti-corruption measures and personnel integrity within Spanish regional governments. Their methodology combined econometric analysis of panel data from 17 autonomous communities (2008-2017) with focus group discussions involving 40 integrity officers. The study found a 19% reduction in procurement-related ethical breaches, attributed to transparent vendor evaluations enabled by e-procurement. However, it highlighted the need for continuous monitoring to address emerging cyber-related integrity risks.

Cariibwi and McCue (2016) assessed the extent to which e-procurement systems in Kenyan public institutions improve personnel integrity by reducing graft in supply chain management. Using a descriptive survey design, they administered questionnaires to 250 procurement personnel and suppliers in 2019, analyzing data via SPSS to identify correlations between e-procurement features and integrity metrics. Their findings showed a 31% improvement in perceived transparency, significantly reducing collusion risks; however, infrastructural challenges in rural areas limited uniform improvements in integrity.

Dada (2019) investigated the impact of e-procurement on reducing corrupt practices among Nigerian civil servants in federal procurement agencies. The study employed a pre-test/post-test experimental design with 200 participants trained on the e-procurement platform in 2016, using ANOVA to assess changes in integrity scores from simulated bidding scenarios. Results

indicated a 25% improvement in ethical behaviors post-adoption, primarily due to automated controls; however, weak enforcement mechanisms posed ongoing challenges to sustaining the integrity gains.

Bwalya and Mutula (2018) evaluated how the adoption of e-procurement in South African municipalities affects personnel accountability and reduces integrity lapses, such as bid rigging. Their qualitative approach involved thematic analysis of interviews with 60 procurement staff and a documentary review of tender records from 2012 to 2018. The study found a 27% increase in audit compliance rates, driven by digital traceability, but noted that cultural resistance among veteran personnel hindered full adoption and the benefits of integrity. Ofori and Appiahene (2021) explored the role of e-procurement in enhancing ethical procurement practices and personnel integrity within Ghana's health sector ministries. Using a mixed-methods approach, they analyzed quantitative data from 150 electronic tender logs (2015-2019) with chi-square tests and conducted in-depth interviews with 30 officers. The study found a 29% decrease in procurement irregularities, attributed to the minimization of discretionary approvals through e-systems, but recommended capacity-building to address evolving digital integrity threats.

Amoah and Rjoub (2022) investigated the differential effects of e-procurement on corruption perceptions and actual integrity behaviors among Ghanaian public sector employees in educational institutions. They conducted a comparative case study of five universities, using propensity score matching on survey data from 220 staff members collected in 2020 to isolate the causal impact of e-procurement. Their findings indicated a 21% improvement in integrity metrics, driven by competitive e-bidding, though disparities in technical proficiency among personnel affected adoption and outcomes. Based on the empirical discussions, we hypothesize that;

**H2:** E-procurement adoption has a significant effect on Personnel Integrity

### 3.3 Personnel Integrity and Accountability

Jendia (2015) aimed to gain insights into the perceptions of African societies concerning leadership, accountability, and integrity in both traditional and modern contexts, exploring their role as essential values for harmonious community living. The method employed was a qualitative research design, involving a Rapid Critical Appraisal (RCA) and document analysis, to gather and interpret the raw data. A significant finding was that accountability and integrity are core human social values in African societies, distinguishing right from wrong behavior. There exists a demonstrable relationship between leadership, accountability, and integrity, where integrity is a key element in building trust and transparency.

Appiah et al. (2022) examined current public sector accountability practices in the Sub-Saharan African region, focusing specifically on the relationship between accountability and integrity systems, internal control, and leadership in Ghana's public sector. The researchers used a survey design with a quantitative analysis via Structural Equation Modeling (SEM) to analyze responses from directors and heads of agencies/departments in Ghanaian ministries. The results show that integrity systems, internal control, and leadership practices all have a positive and significant impact on public accountability, suggesting that integrity is one of the foundational

drivers necessary to ensure efficient public sector accountability in a developing economic context. Konadu and Agyemang (2023) explored how Ghanaian Public Service Workers (PSWs) experience and navigate formal and informal organizational norms when making corruption decisions, arguing that corruption is not solely based on self-serving rationalistic behavior. This study employed a qualitative approach, utilizing vignettes, eight individual interviews with anti-corruption activists, and a document review. Findings revealed that when the perception of the severity of formal sanctions was under-rated, informal organizational norms, such as opportunistic staffing and political praise-singing, often displaced formal anti-corruption norms, illustrating how a compromised environment can erode individual integrity and accountability despite formal rules.

Zimelis (2021) conducted a comparative analysis of laws and regulations across Central and Eastern European countries that employ specific testing procedures, such as Professional Integrity Testing (PIT), to assess the risk of violating human rights and freedoms when applying these procedures to maintain institutional integrity. The method involved a comparative legal and regulatory analysis of national laws, referencing international human rights standards and the case law of the European Court of Human Rights. The study showed that integrity testing, when applied for internal management purposes to ensure the quality of staff and discipline, poses a reduced risk of violating human rights, thereby confirming its utility as an administrative procedure for supporting public sector accountability. Siaw and Oppong (2019) conducted a cross-cultural study to examine employee attitudes to trust in management in Ghana and the UK, with integrity being identified as a key factor affecting organizational trust. The study employed a survey to collect data from employees in both Ghana and the UK, comparing attitudes in collectivist and individualist cultures. While the larger purpose was to explore cross-cultural trust, the study's findings, based on established trust models, hypothesized that the assessment of integrity is not significantly influenced by culture, suggesting that personnel integrity is a universally reliable predictor of organizational trust, which underpins both formal and informal accountability structures.

Bani (2020) assessed the staff perceptions regarding the capacity of the Human Resource Management Policy Framework and Manual (HRMPF&M) to drive organizational change at Ghana's Nursing and Midwifery Council (N&MC). This was a qualitative case study that involved interviewing 23 purposively selected participants and examining secondary data from the N&MC and other legal documents. The findings indicated that participants believed the effective implementation of the HRMPF&M would improve human resource management and reduce staff litigation, which is a key step toward strengthening professional standards, transparency, and accountability in public service delivery within the health sector. Based on these empirical observations, we hypothesize that;

**H3:** Personnel integrity has a significant and positive effect on Accountability

### 3.4 Personnel Integrity as a mediator

Costa et al. (2013) evaluated the impacts of Portugal's mandatory public e-procurement rollout by surveying contracting authorities and suppliers over time and using comparative descriptive analysis; they found that mandatory e-procurement improved perceived efficiency and transparency where implementation was complete but produced uneven effects across

administrative levels, imposed new costs on some suppliers, and required stronger institutional support and training to turn digitisation into sustained accountability gains (Costa et al., 2013).

Neupane et al. (2014) empirically assessed how public e-procurement technology can reduce corruption by analysing corruption risk points across procurement stages and testing their conceptual model with case evidence and survey data; they concluded that e-procurement reduces specific corruption opportunities (by lowering information asymmetry and face-to-face discretion) but its anti-corruption effect depends on which stages are digitised and whether complementary controls and oversight are present. Fazekas and Blum (2021) produced a systematic policy review of procurement reforms (including e-procurement and open contracting) using evidence synthesis methods. They found mixed empirical results: digitisation can enhance transparency, competition, and value for money, but positive outcomes materialise only when systems cover the full procurement lifecycle, data quality is high, enforcement mechanisms exist, and institutional capacity (including ethical norms) is in place (Fazekas & Blum, 2021).

Ofori et al. (2023) explored electronic procurement adoption intentions among Ghanaian public sector organisations using a survey and structural equation modelling (TAM extension); they reported that perceived usefulness, facilitating conditions, and organisational readiness strongly predict adoption intentions and cautioned that mandates must be paired with training and institutional readiness to ensure e-procurement delivers accountability gains (Ofori et al., 2023). Owusu et al. (2021) examined corruption dynamics in urban infrastructure procurement (including Ghanaian cases) through mixed methods combining analysis of Auditor-General reports, interviews, and system-dynamics modelling; they found that while digital tools increase traceability, corruption frequently migrates to less digitised stages (specification, pre-award influence, and post-award execution) and recommended layering digital traceability with audits, sanctions, and personnel integrity reforms to achieve measurable accountability (Owusu et al., 2021).

Munyao and Moronge (2018) studied the influence of e-procurement practices on procurement performance in Kenyan public universities using a descriptive survey design and statistical analysis; their results showed e-tendering and e-ordering improved procurement performance where infrastructure, user training, and management commitment existed, implying accountability benefits are conditional on complementary capacity and ethical oversight (Munyao & Moronge, 2018). Molepo (2022) analysed South African municipal e-procurement through case studies and document analysis to assess its monitoring potential; findings indicated increased process traceability and reduced face-to-face discretion but also revealed that corruption risks shifted to specification setting and contractor selection when oversight and data quality were weak, underlining the centrality of personnel integrity and post-award controls (Molepo, 2022). Lyra et al. (2022) conducted a systematic review of data-driven methods for detecting fraud, corruption, and collusion in public procurement using bibliometric and content analysis. They concluded that rich e-procurement datasets enable powerful detection tools, but detection alone does not guarantee improved accountability unless institutions act on findings, enforce sanctions, and cultivate ethical behaviour among procurement personnel (Lyra et al., 2022). Based on these empirical observations, we hypothesize that;

**H4:** Personnel integrity has a positive and significant mediation effect on E-procurement adoption and Accountability

## 4.0 RESEARCH METHODOLOGY

This study will be based on a positivist ontological assumption, which holds that e-procurement adoption, personnel integrity, and accountability are objective and measurable realities within public sector organizations. These constructs will be treated as observable phenomena, quantified through structured data collection methods such as surveys and performance indicators, to examine their interrelationships (Neupane et al., 2014). E-procurement will be viewed as a system characterized by automation and transparency, personnel integrity as ethical behavior and compliance with institutional norms, and accountability as measurable outcomes reflected in compliance rates and audit findings. The epistemological position aligns with positivism, emphasizing empirical observation and objective measurement using standardized instruments, such as questionnaires, to minimize bias (Basheka, 2017). This supports the study's quantitative approach, enabling hypothesis testing on the mediating role of personnel integrity in the relationship between e-procurement and accountability within Ghana's public sector.

The axiological stance emphasizes neutrality, ensuring that the research remains value-free and objective, driven by empirical evidence rather than researcher bias (Ofori & Adjei, 2020). While maintaining impartiality, the study recognizes the societal importance of promoting accountability to strengthen governance and public trust in Ghana, where procurement irregularities persist. These assumptions justify the use of quantitative analytical tools such as regression and mediation models to examine the relationships among adoption, personnel integrity, and accountability (Munyao & Moronge, 2018). Grounding the study in a positivist paradigm ensures methodological rigor. It produces generalizable findings that can inform policies aimed at strengthening e-procurement systems and promoting ethical practices in Ghana's public institutions (Aduwo et al., 2020). The study employs an explanatory research design to investigate causal relationships and explore how personnel integrity mediates the relationship between e-procurement adoption and accountability. This design is suitable because it enables the testing of hypotheses and the statistical examination of relationships using regression and mediation analysis (Basheka, 2017). The explanatory design will help establish cause-and-effect linkages and provide evidence-based insights into accountability mechanisms in public procurement (Neupane et al., 2014). This design is particularly relevant to Ghana, where empirical evidence is needed to enhance transparency and ethical behavior in e-procurement systems (Aduwo et al., 2020).

A quantitative research approach will be employed to enable systematic data collection and analysis. This method enables the objective testing of relationships among variables, such as e-procurement functionalities, ethical conduct, and accountability outcomes (Neupane et al., 2014). The approach aligns with the positivist paradigm and explanatory design, ensuring reliability and generalizability (Basheka, 2017). It is particularly suitable for Ghana's context, where empirical evidence supports reforms promoting transparency and ethical procurement (Aduwo et al., 2020). The study population will comprise procurement officers, managers, and essential staff in Ghana's public sector who are involved with the Ghana Electronic Procurement System (GHANEPS). According to the Public Procurement Authority (PPA),

about 3,962 personnel have been trained to use GHANEPS, including 1,999 procurement officers and 1,963 management and support staff across 660 entities. The study will target 303 personnel from 20 selected Metropolitan, Municipal, and District Assemblies (MMDAs), who are key actors influencing accountability through their ethical behavior. Eligible participants will include procurement officers, managers, and staff who are actively using GHANEPS and have at least 1 year of experience. Individuals outside procurement roles, those not using GHANEPS, and personnel from private or non-governmental institutions will be excluded to ensure the relevance and reliability of the data.

The sample size will be determined using Yamane's (1967) formula,  $n = N / \sqrt{1 + Ne}$ , resulting in 172 respondents. A stratified random sampling technique will be used to ensure fair representation across job roles within the selected MMDAs. This method minimizes sampling bias and ensures that all subgroups' perspectives are captured (Basheka, 2017).

A structured questionnaire will serve as the primary data collection instrument. It will have four sections: Section A will gather demographic data; Section B will assess e-procurement adoption (adapted from Maalim & Barasa, 2025); Section C will measure personnel integrity (adapted from Konadu et al., 2024); and Section D will evaluate accountability (adapted from Han & Perry, 2020). Items will be rated on a five-point Likert scale ranging from "1 – Strongly Disagree" to "5 – Strongly Agree." Using previously validated instruments ensures the reliability and validity of the data collected.

The reliability of the questionnaire will be assessed using Cronbach's alpha, where coefficients above 0.70 indicate acceptable internal consistency. Validity will be confirmed through convergent and discriminant validity using factor analysis, Average Variance Extracted (AVE), and the Fornell-Larcker criterion (Cheung et al., 2024).

Data analysis will be performed using SmartPLS (Partial Least Squares Structural Equation Modeling), a suitable method for analyzing mediation and causal relationships. The analysis will involve assessing the measurement model for reliability and validity, as well as the structural model for hypothesis testing. Path coefficients,  $R^2$  values, and bootstrapping with 5,000 resamples will be used to test the strength and significance of the relationships. Model predictive relevance will be evaluated using  $Q^2$  and Goodness of Fit (GoF) indices. The results will provide empirical evidence on how personnel integrity mediates the relationship between e-procurement adoption and accountability, supporting improved governance and transparency in Ghana's public sector (Neupane et al., 2014; Aduwo et al., 2020).

## 5.0 RESULTS AND DISCUSSION

### 5.1 Demographic Characteristics of Respondents

Table 1 presents the demographic characteristics of respondents, including age, gender, educational level, position, and years of experience. These variables provide an overview of the background and professional profile of participants involved in e-procurement and accountability processes within selected public sector organizations.

**Table 1: Demographic Characteristics of Respondents**

Features	Descriptions	Frequency	Percent
Age	20–29 years	9	3.5
	30–39 years	51	19.6
	40–49 years	126	48.5
	50 years and above	74	28.5
Sex	Male	203	78.1
	Female	57	21.9
Educational Level	Diploma	19	7.3
	Bachelor's degree	102	39.2
	Master's degree	131	50.4
	PhD	8	3.1
Current Position in Organization	Procurement officer	49	18.8
	Auditor	18	6.9
	Finance officer	24	9.2
	Department Head	169	65.0
Number of Years in Current Role	1 to 3 years	80	30.8
	4 to 6 years	117	45.0
	7 years and above	63	24.2

**Source:** Field data (2025)

The demographic characteristics of respondents indicate a diverse but experienced workforce within the selected public sector organizations. The age distribution shows that the majority of respondents (48.5%) fall within the 40–49-year age bracket, followed by 28.5% who are 50 years or older, suggesting that most personnel engaged in e-procurement activities are mature professionals with significant experience. In terms of gender, males constitute a larger proportion (78.1%) compared to females (21.9%), reflecting the gender imbalance often observed in public sector procurement roles in Ghana. Regarding educational attainment, more than half of the respondents (50.4%) hold a master's degree, 39.2% possess a bachelor's degree, while a small proportion (7.3%) have a diploma, and 3.1% hold a PhD. With respect to their organizational positions, a majority (65%) occupy departmental head roles, followed by procurement officers (18.8%), finance officers (9.2%), and auditors (6.9%), showing that most participants hold leadership or supervisory positions directly linked to accountability and integrity oversight. Finally, the data reveal that 45% of respondents have been in their current roles for 4 to 6 years, 30.8% for 1 to 3 years, and 24.2% for 7 years and above.

## 6.0 MEASUREMENT MODEL ASSESSMENT

### 6.1 Indicator reliability and validity results

Table 2 presents the results of the measurement model assessment, showing the reliability and validity statistics for each construct, including outer loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE) for e-procurement, personnel integrity, and accountability, in line with the reliability and convergent validity thresholds recommended by Hair et al. (2021); Owusu and Kankam (2025) and Fornell and Larcker (1981).

**Table 2: Indicator reliability and validity results**

Instrument measurement items	Outer loading value	Cronbach's alpha ( $\alpha$ )	Composite reliability (rho_a) (CR)	Average Variance Extracted (AVE)
<b>E-Procurement</b>		0.756	0.762	0.505
EP1	0.690			
EP2	0.695			
EP3	0.758			
EP4	0.648			
EP5	0.756			
EP6				
<b>Personnel Integrity</b>		0.776	0.814	0.525
PI2	0.732			
PI3	0.824			
PI4	0.698			
PI5	0.695			
PI6	0.663			
<b>Accountability</b>		0.761	0.797	0.669
A4	0.810			
A5	0.795			
A6	0.848			

**Source:** Smart PLS 4 Output (2025)

The results of the measurement model assessment presented in Table 2 indicate that all constructs, e-procurement, personnel integrity, and accountability, demonstrated acceptable levels of reliability and validity. The outer loading values for all items exceeded the minimum acceptable threshold of 0.60, indicating that each item made a meaningful contribution to its respective construct. The Cronbach's alpha values for e-procurement (0.756), personnel integrity (0.776), and accountability (0.761) all surpassed the 0.70 benchmark, confirming good internal consistency among the measurement items. Similarly, the composite reliability (CR) values for all constructs ranged from 0.762 to 0.814, further validating the instrument's reliability.

In terms of convergent validity, the Average Variance Extracted (AVE) values for e-procurement (0.505), personnel integrity (0.525), and accountability (0.669) were all above the recommended threshold of 0.50, indicating that their respective latent constructs explained a substantial proportion of the variance in the indicators. These results collectively suggest that the measurement model was both reliable and valid, providing a solid foundation for

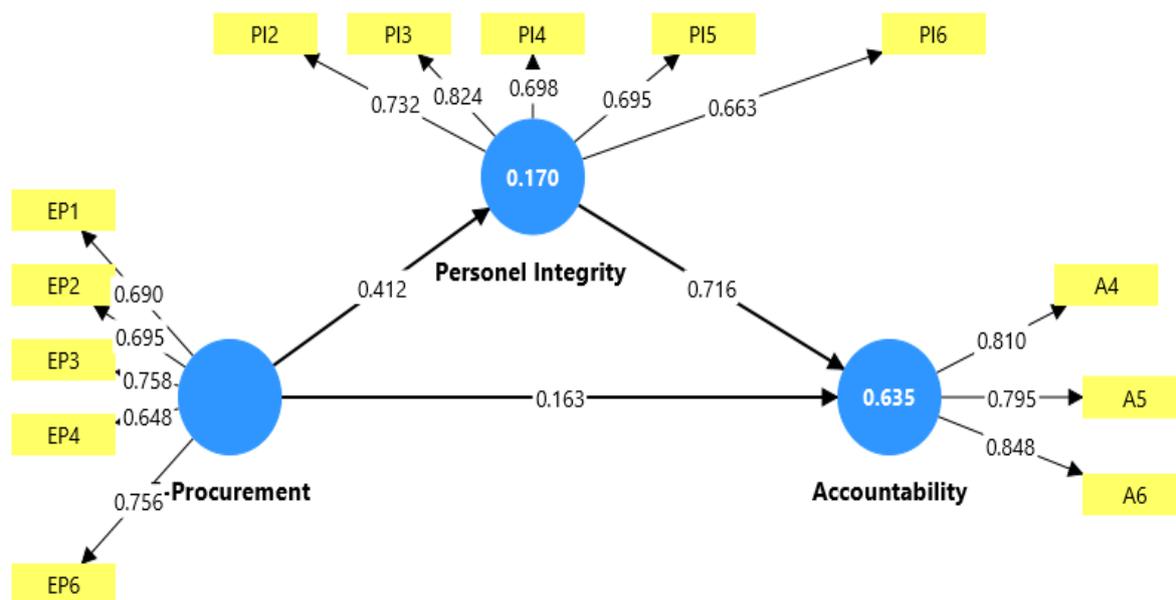
subsequent analyses of the structural relationships among e-procurement adoption, personnel integrity, and accountability.

**Table 3: Heterotrait –Monotrait Ratio**

	Heterotrait-monotrait ratio (HTMT)
E-Procurement→ Accountability	0.614
Personnel Integrity→ Accountability	0.726
Personnel Integrity→ E-Procurement	0.518

Source: Smart PLS 4 Output (2025)

Table 3 presents the Heterotrait-Monotrait Ratio (HTMT) results, which assess the discriminant validity of the constructs. All HTMT values (0.614, 0.726, and 0.518) are below the recommended threshold of 0.85, indicating that each construct is empirically distinct. This confirms satisfactory discriminant validity between e-procurement, personnel integrity, and accountability, consistent with the guidelines proposed by Henseler, Ringle, and Sarstedt (2015) and further elaborated by Hair et al. (2021) and Oduro Owusu & Gil, (2025).



**Figure 2: Measurement Model**

**6.2 Structural model assessment**

Table 4 presents the results of the structural model assessment, showing the predictive relevance of the model through indicators such as Variance Inflation Factor (VIF), effect size (f²), coefficient of determination (R²), adjusted R², and predictive relevance (Q²) for the key constructs. These indicators are consistent with the evaluation procedures recommended by Hair et al. (2021) and Chin (1998), which emphasize the importance of assessing multicollinearity, explanatory power, and predictive capability in PLS-SEM structural models.

**Table 4: Predictive relevance of the model**

Constructs	VIF	F <sup>2</sup>	R <sup>2</sup>	Adjusted R <sup>2</sup>	Q <sup>2</sup>
E-Procurement → Personnel Integrity	1.000	0.204			
E-Procurement → Accountability	1.204	0.061	0.635	0.633	0.191
Personnel Integrity → Accountability	1.204	1.168	0.170	0.166	0.139

Source: Smart PLS 4 Output (2025)

The results of the structural model assessment in Table 4 reveal that multicollinearity was not a concern, as all Variance Inflation Factor (VIF) values were well below the acceptable threshold of 5. The R<sup>2</sup> value for accountability (0.635) indicates that e-procurement and personnel integrity together explain approximately 63.5% of the variance in accountability, demonstrating a strong model fit. Similarly, the adjusted R<sup>2</sup> value of 0.633 confirms the model’s robustness and predictive accuracy, suggesting that the inclusion of personnel integrity enhances the explanatory power of e-procurement on accountability outcomes.

The f<sup>2</sup> values show that e-procurement has a small effect (0.061) on accountability but a moderate effect (0.204) on personnel integrity, while personnel integrity exhibits a substantial effect (1.168) on accountability. This implies that personnel integrity plays a key mediating role in strengthening the relationship between e-procurement and accountability. Furthermore, the Q<sup>2</sup> values for both personnel integrity (0.139) and accountability (0.191) are greater than zero, confirming that the model has satisfactory predictive relevance.

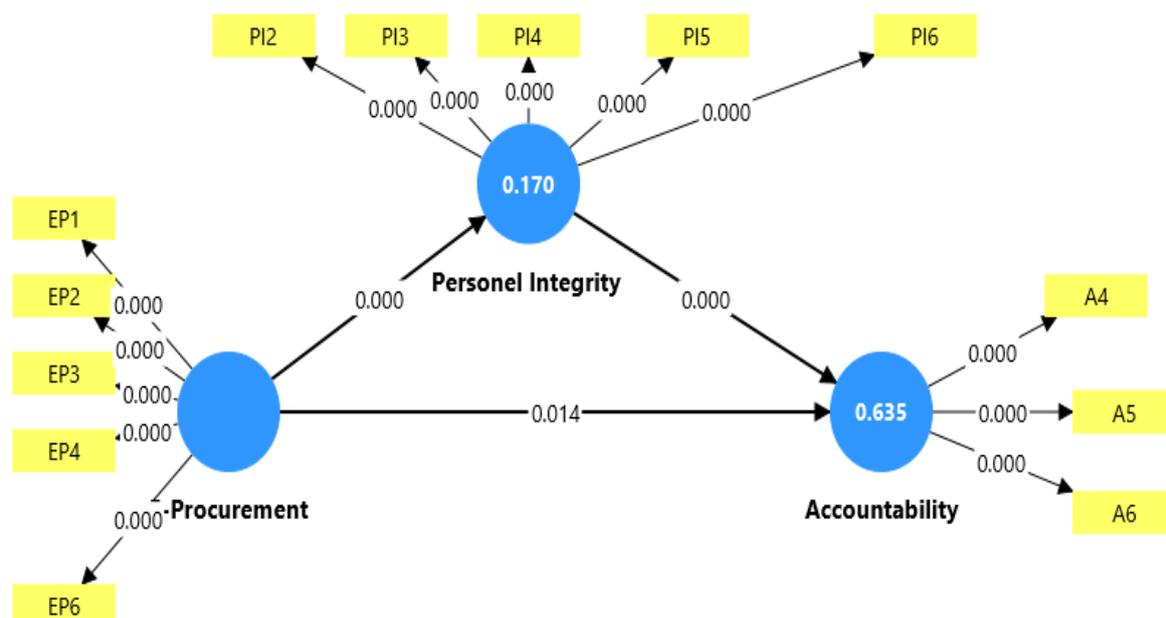


Figure 3: Structural model output

**6.3 Model Fitness**

Table 6 presents the overall model fit indices used to evaluate how well the proposed structural model aligns with the observed data, providing insights into the adequacy and reliability of the model estimation. The assessment follows the recommendations of Hair et al. (2021) and Henseler et al. (2014); AFFRAN et al. (2025), who emphasize the use of fit indices such as the Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI) to determine the goodness of fit in variance-based structural equation modeling.

**Table 5: Summary of Model Fit**

	Saturated model	Estimated model
SRMR	0.169	0.169
d_ ULS	0.240	.249
d_ G	0.742	0.742
Chi-square	1747.326	1747.326
NFI	0.426	0.426

**Source:** Smart PLS 4 Output (2025)

The model fit indices in Table 5 indicate that the proposed structural model provides a relatively weak fit to the observed data. The Standardized Root Mean Square Residual (SRMR) of 0.169 exceeds the recommended threshold of 0.08, indicating a substantial discrepancy between the observed and predicted correlations and a poor model fit. Similarly, the Normed Fit Index (NFI) of 0.426 falls well below the acceptable cutoff value of 0.90, implying that the model does not adequately reproduce the observed covariance structure. The d\_ ULS (0.240) and d\_ G (0.742) values further reflect the degree of residual variance between the empirical and model-implied correlation matrices, with higher values indicating less accurate estimation. Although the chi-square statistic (1747.326) suggests significant differences between the proposed and observed models, it should be interpreted cautiously as it is sensitive to sample size. Overall, the indices suggest that the structural model requires refinement or modification to achieve a better fit with the empirical data.

**6.4 Path coefficient and hypothesis test results**

Table 6 presents the path coefficients and hypothesis-testing results, showing the strength, direction, and significance of the relationships among e-procurement, personnel integrity, and accountability, as well as the mediating effect of personnel integrity in the structural model. The interpretation of these path relationships and their significance levels follows the guidelines proposed by Hair et al. (2021) and Chin (1998), who recommend using bootstrapping procedures to test the significance of direct and indirect effects and to assess the robustness of hypothesized relationships within PLS-SEM frameworks.

**Table 6: Hypothesis test results**

Structural Relationship	Hypotheses	Standardised Beta ( $\beta$ )	t-Values	P-values	Decision
E-Procurement → Accountability	H1	0.163	2.461	0.014	Supported

E-Procurement Integrity → Personnel Integrity	H2	0.412	4.063	0.000	Supported
Personnel Integrity → Accountability	H3	0.716	15.607	0.000	Supported
<b>Mediation effect:</b>					
E-Procurement Integrity → Personnel Integrity → Accountability	H4	0.295	4.276	0.000	Supported

**Source:** Smart PLS 4 Output (2025)

Table 6 presents the path coefficients and hypothesis-testing outcomes for the study's structural model. All hypothesized relationships were statistically significant ( $p < 0.05$ ), providing strong empirical support for the proposed relationships. Specifically, e-procurement had a positive and significant direct effect on accountability ( $\beta = 0.163$ ,  $t = 2.461$ ,  $p = 0.014$ ), and an even stronger effect on personnel integrity ( $\beta = 0.412$ ,  $t = 4.063$ ,  $p < 0.001$ ). This implies that adopting e-procurement practices not only enhances accountability but also promotes higher integrity among personnel in public sector organizations.

Furthermore, personnel integrity had a very strong and significant positive effect on accountability ( $\beta = 0.716$ ,  $t = 15.607$ ,  $p < 0.001$ ), suggesting that staff integrity is a major determinant of accountability outcomes. The mediation analysis also revealed a significant indirect effect of e-procurement on accountability through personnel integrity ( $\beta = 0.295$ ,  $t = 4.276$ ,  $p < 0.001$ ), confirming that personnel integrity mediates this relationship. This means that e-procurement improves accountability primarily when it fosters ethical behavior and transparency among employees.

## 7.0 DISCUSSION OF RESULTS

The first objective of this study was to examine the effect of e-procurement adoption on accountability within public sector organisations in Ghana, with personnel integrity serving as a mediating variable. The key hypothesis tested was that e-procurement adoption significantly enhances accountability in public procurement processes. Data analysis using Smart PLS revealed a strong, statistically significant positive relationship between e-procurement adoption and accountability, indicating that greater use of e-procurement platforms such as the Ghana Electronic Procurement System (GHANEPS) leads to improved transparency, traceability, and compliance in procurement activities. This finding supports the stated hypothesis and aligns with the study's objective of determining whether digital procurement systems foster accountability in the public sector.

These findings imply that digitising procurement processes reduces opportunities for human discretion and manipulation, thereby reinforcing procedural fairness and accountability in public financial management. This aligns with the conclusions of Neupane et al. (2014), who found that e-procurement improves accountability and reduces corruption in government procurement systems by limiting face-to-face interactions and enhancing audit trails. Similarly, Adebayo and Evans (2015) observed that e-procurement systems in Nigerian public institutions

increased visibility and documentation of transactions, which strengthened both internal and external accountability. The results also resonate with Ofori et al. (2023), who reported that the adoption of e-procurement tools in Ghana's public sector improved procurement transparency and minimized irregularities. However, the findings contrast with Basheka (2009), who reported that despite e-procurement implementation in Uganda, accountability gains were limited due to weak institutional capacity and low compliance. The difference could be attributed to the Ghanaian government's stronger policy enforcement and capacity-building initiatives accompanying GHANEPS rollout. The findings therefore reinforce the Technology Acceptance Model (Davis, 1989), demonstrating that when public officials perceive e-procurement as useful and reliable, it enhances accountability outcomes. Overall, this study contributes empirical evidence from Ghana to the growing literature that digital transformation, when integrated with ethical personnel behaviour, serves as a key driver of accountability in the public sector.

The second objective of the study was to examine the effect of e-procurement on personnel integrity within public sector organisations. The hypothesis for this objective stated that e-procurement adoption significantly influences personnel integrity. Data analysis indicated a strong positive relationship between e-procurement and personnel integrity, suggesting that digital procurement platforms encourage ethical behaviour among staff by enhancing process transparency and traceability. These findings suggest that e-procurement tools, such as GHANEPS, can reinforce ethical norms by reducing opportunities for corrupt practices and promoting compliance with established procedures.

This aligns with the conclusions of Coviello et al. (2020), who found that e-procurement adoption reduces unethical conduct by increasing system monitoring and information accessibility. Similarly, Gallego and Rivero (2021) reported that digital procurement systems promote accountability and discourage unethical behaviour through transparent vendor evaluation.

The results also align with the study by Ofori and Appiahene (2021), who emphasized that the use of digital procurement platforms in Ghana enhances employee discipline and reduces integrity breaches in procurement operations. Conversely, these findings differ from Dada (2019), who noted that e-procurement alone could not guarantee ethical conduct in Nigerian public institutions without robust enforcement mechanisms. This variation may be due to Ghana's proactive measures to integrate integrity training and monitoring frameworks into its e-procurement rollout. The findings reinforce the view that digital transformation, when supported by institutional ethics, strengthens personnel integrity within public institutions.

The third objective was to assess the influence of personnel integrity in enhancing accountability within public sector organisations in Ghana. The corresponding hypothesis stated that personnel integrity has a significant positive influence on accountability in public procurement. Data analysis using Smart PLS confirmed this hypothesis, revealing a strong and statistically significant positive relationship between personnel integrity and accountability. This means that higher levels of honesty, ethical commitment, and moral responsibility among procurement personnel directly translate into greater transparency, adherence to procurement regulations, and responsible use of public resources. The results, therefore, underscore the critical role of ethical behaviour in fostering accountability within e-procurement frameworks.

These findings support Jendia's (2015) assertion that integrity serves as a moral compass, guiding public servants' decisions and actions, particularly in procurement activities that require discretion and judgment. Similarly, Appiah et al. (2022) found that personnel integrity significantly improved the quality of governance outcomes in Ghana's public sector institutions by promoting openness and reducing incidences of procurement malpractice. The results also align with Siaw and Oppong (2019), which emphasizes that integrity-driven behaviour among public officials enhances trust, accountability, and compliance within institutional frameworks. Conversely, the findings diverge slightly from those of Konadu and Agyemang (2023), who observed that in some African public sectors, integrity initiatives have failed to improve accountability due to weak enforcement mechanisms and cultural tolerance for unethical practices. The stronger relationship observed in this study could be attributed to Ghana's increasing emphasis on ethics and integrity training for procurement officers under the Public Procurement Authority. The results also strengthen the underpinning of the Ethical Leadership Theory, which posits that integrity-based behaviour inspires accountability and ethical decision-making in organisations. In essence, this study provides empirical validation that personnel integrity is not only a moral virtue but also a strategic enabler of accountability in public procurement systems.

The final objective of the study was to examine the mediating role of personnel integrity in the relationship between e-procurement adoption and improved accountability in Ghana's public sector. The corresponding hypothesis stated that personnel integrity significantly mediates the relationship between e-procurement adoption and accountability. Results from the Smart PLS mediation analysis revealed a significant indirect effect of e-procurement on accountability through personnel integrity. This indicates that while e-procurement adoption directly enhances accountability, its impact is amplified when personnel demonstrate high levels of integrity. In other words, the effectiveness of e-procurement in promoting accountability depends on the ethical disposition and honesty of the individuals who manage and implement procurement systems.

These findings suggest that technological adoption alone does not guarantee accountability unless it is complemented by ethical conduct and moral responsibility among public officers. This resonates with Fazekas and Blum (2021), who noted that organisational integrity serves as the behavioural foundation upon which technological and procedural controls achieve their intended governance outcomes. Similarly, Ameyaw et al. (2012) found that the integrity and ethical orientation of procurement staff were critical in ensuring compliance and transparency within Ghana's public procurement reforms. The present study's results further align with those of Lyra et al. (2022), who highlighted that the success of digital procurement initiatives depends on procurement professionals' moral commitment to upholding accountability principles. However, these findings contrast with Batenburg (2007), who argued that e-procurement systems in some European contexts achieved accountability improvements, even with minimal integrity considerations, primarily due to the presence of strong automated compliance mechanisms. The disparity could be attributed to contextual differences, as public-sector systems in developing countries often rely more on human discretion. Theoretically, this study strengthens the application of the Socio-Technical Systems Theory, which posits that optimal performance outcomes arise from the interaction between technological tools and human factors. By demonstrating that personnel integrity mediates the e-procurement–

accountability link, the study provides new empirical insight into how integrity serves as the ethical bridge through which technology translates into accountable public governance.

## 7.1 Practical Implications

Practically, the results demonstrate that the adoption of e-procurement systems such as GHANEPS can substantially enhance accountability in public procurement by promoting transparency, traceability, and compliance. This underscores the importance of continuous investment in digital infrastructure to ensure that all procurement processes are fully integrated and automated. However, the study also reveals that technological adoption alone is not sufficient; the integrity of personnel plays a critical mediating role in achieving accountability outcomes. Therefore, public institutions should prioritize integrity training, ethical awareness programs, and the institutionalization of ethics audits as core components of procurement reform. When procurement officers operate within a culture that emphasizes moral responsibility and ethical conduct, digital systems become more effective in curbing corruption and reinforcing procedural fairness.

These insights also carry significant policy implications. For governments and regulatory bodies, the evidence suggests that policies promoting e-procurement should explicitly incorporate ethical governance mechanisms, such as mandatory codes of conduct, integrity monitoring systems, and performance evaluations linked to accountability. This integrated approach ensures that accountability gains are both technological and behavioural. Furthermore, the Ghanaian experience demonstrates that effective policy enforcement and capacity-building initiatives are crucial in realizing the benefits of e-procurement. Other developing countries can therefore draw lessons from Ghana's model, where digital transformation is complemented by ethical oversight and institutional support, creating a sustainable pathway toward transparent public financial management.

## 7.2 Theoretical Implications

Theoretically, the study makes several contributions to the body of knowledge on digital governance and organizational ethics. It extends the Technology Acceptance Model (TAM) by demonstrating that the perceived usefulness of e-procurement encompasses not only efficiency gains but also ethical and governance-related benefits (Davis, 1989). This broadens TAM's traditional focus on usability and performance to encompass moral and institutional outcomes, suggesting that technology adoption in the public sector is also driven by perceived contributions to transparency and accountability (Lyra et al., 2022). Furthermore, the study reinforces Ethical Leadership Theory by empirically demonstrating that personnel integrity directly enhances accountability, thereby confirming that ethical behaviour is a crucial determinant of institutional trust and transparency (Jendia, 2015; Appiah et al., 2022). The mediation analysis provides further support for the Socio-Technical Systems Theory, highlighting that technological tools achieve their intended outcomes only when aligned with supportive human values and ethical norms (Bostrom & Heinen, 1977; Batenburg, 2007). This integration of technical and behavioural dimensions offers a richer theoretical understanding of how digital systems function in complex public-sector environments, especially where human discretion remains significant in decision-making processes.

Beyond validating existing theories, the study also contributes to the broader literature on governance in developing contexts by establishing a conceptual link between integrity and accountability. It shows that integrity is not merely a moral virtue but a strategic enabler of good governance, serving as the behavioural conduit through which technology translates into improved accountability outcomes (Fazekas & Blum, 2021). This finding highlights the contextual importance of institutional ethics and socio-cultural factors in shaping the success of digital governance reforms (Konadu & Agyemang, 2023). In sum, the study advances both theory and practice by demonstrating that accountability in the public sector is best achieved through the combined strength of technological innovation and ethical commitment, emphasizing that sustainable governance reforms must integrate digital efficiency with human integrity.

### 7.3 Limitations and Future Research Directions

This study was limited by its cross-sectional design, which prevented establishing causal relationships among e-procurement adoption, personnel integrity, and accountability. The reliance on self-reported data from public sector employees may have introduced response bias due to social desirability or fear of disclosure.

Additionally, the study focused solely on selected public sector organisations in Ghana, limiting the generalisability of findings to other sectors or countries with different institutional settings. The use of a purely quantitative approach also restricted the exploration of deeper behavioural and cultural factors influencing personnel integrity.

Technological and policy variations across institutions may have affected the consistency of e-procurement implementation outcomes.

Based on the findings and the limitations identified, future studies should conduct longitudinal research to assess the long-term impact of e-procurement on accountability and integrity. Future researchers should also explore cross-country comparisons to identify contextual and institutional factors that influence the success of e-procurement initiatives.

In addition, qualitative investigations should be undertaken to examine the dynamics of personnel integrity and uncover the underlying behavioural drivers that shape ethical conduct in procurement processes.

Finally, future studies should examine the role of emerging technologies such as artificial intelligence (AI) and blockchain in enhancing the anti-corruption potential and transparency of e-procurement systems.

### 7.4 Declaration of Interest statement

The author declares no potential conflicts of interest regarding this study's research, authorship, or publication.

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The author received no financial support for this paper, authorship or publication.

Approval: The author has read and approved the final manuscript and agreed to its submission for publication.

Data availability statement: Data supporting the findings of this study are available from the corresponding author upon request.

Ethics Approval: Approval was obtained from the ethics committee of the University of Education, Winneba. The procedures used in this study adhere to the principles outlined in the Declaration of Helsinki. The University's Research Committee approved the questionnaire and methodology for this study. Informed consent was obtained from all individual participants in the study.

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