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An investigation on the factors affecting the adoption of e-procurement systems: A focus on the Mpumalanga Provincial Treasury

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Background: The adoption of e-procurement is globally recognised as a key driver of procurement modernisation, enhancing efficiency, transparency and cost-effectiveness. South Africa has experienced delays in fully embracing e-procurement, especially within government departments provincially. The e-procurement is influenced by reliance on traditional administrative practices, limited government support and low technology investment.

Objectives: This study aimed to investigate the factors affecting the adoption of e-procurement systems in the Mpumalanga Treasury.

Method: This study used a quantitative approach with a sample size of 35 staff from the information and communication technology, and Finance departments. The random sampling method was adopted, where a questionnaire survey was used to collect data, and analysed using the SPSS software.

Results: The Mpumalanga Treasury has not yet adopted e-procurement. A factor such as ICT infrastructure has a strong influence on management support to implement the e-procurement. To effectively execute this adoption, the treasury must place a strong emphasis on the availability of essential infrastructures.

Conclusion: The implementation of e-procurement would result in substantial advantages, particularly cost savings, increased productivity, and improvement in the supply chain principles, such as transparency, fairness, and value for money. E-procurement is frequently viewed as a solution to inefficiencies and cost overruns in conventional procurement processes because it automates and tracks operations with minimum human interaction.

Contribution: This study contributes to the practical importance of prioritising the implementation of digitalisation in the public sector. The findings suggest, actionable insights for policymakers and procurement managers within the Mpumalanga Treasury to address the specific challenges hindering the adoption of e-procurement.

Keywords: procurement; e-procurement; adoption; public sector; supply chain.

Introduction

Technological advancements in the 21st century have driven both public and private sector organisations to adopt automation methods to enhance operational efficiency and eliminate manual processes (Johansson, Thomsen & Åkesson 2023). These advancements have enabled organisations worldwide to transform significantly, including in the procurement of goods, services and works (Maepa, Mpwanya & Phume 2023). A notable development in this transformation is the shift from traditional, paper-based procurement methods to electronic platforms such as e-procurement (Chan & Owusu 2022). E-procurement involves the use of electronic systems and technologies to automate and streamline the procurement process within organisations (Njoki & Nelson 2022).

The adoption of e-procurement systems has emerged as a critical element in modernising procurement processes (Adebayo & Evans 2015; Maepa et al. 2023). By simplifying and integrating procurement processes, e-procurement aims to address the inefficiencies and challenges associated with traditional procurement methods (Chebet & Kihara 2022). These systems leverage digital tools and platforms to enhance the efficiency, transparency and productivity of procurement activities (Hallikas, Immonen & Brax 2021). Key benefits include streamlining the purchasing process from acquisition to payment and strengthening control over supply chains (Obiero & Ngugi 2024), improving compliance processes

(Wahome & Noor 2024), reducing costs (Waithaka & Kimani 2021) and minimising excessive human contact in transactions (Duma 2018). These improvements ultimately contribute to better service delivery across government departments and entities (Mojaki, Tuyikeze & Ndlovu 2024; Mothibi 2020).

Globally, the adoption of e-procurement has been recognised as a transformative approach to doing business, offering significant benefits to organisations (Motaung & Sifolo 2023). However, despite its potential, developing countries, particularly in Africa, have faced challenges in accelerating the adoption of e-procurement. Scholars such as Abdi and Barasa (2023) highlight barriers including limited government support, inadequate technological investment and adherence to traditional administrative practices. As a result, the implementation of e-procurement in government departments has been inconsistent, including in South Africa, where adoption rates remain low (Adebayo & Evans 2015; Mothibi 2020).

Notable examples of e-procurement adoption in South Africa include the Western Cape Provincial Treasury's implementation of the e-procurement in 2022 and eThekwini Municipality's Supplier Self-Service System (SSS), introduced in 2013 (Duma 2018). However, studies on public sector procurement, such as those by Myataza (2015), Kiwekete and Doorgapersad (2017), and Rukuni, Maziriri and Mulaudzi (2020), suggest that adoption remains limited and context dependent. Myataza (2015), for instance, evaluated the state of e-procurement in the Eastern Cape Provincial Government, noting various contextual factors affecting its implementation.

This study seeks to address this gap by investigating the factors influencing the adoption of e-procurement within the Mpumalanga Provincial Treasury. By understanding these factors, the research aims to contribute to the development of tailored solutions for enhancing e-procurement adoption in the public sector.

Literature review
Procurement in the government entities

Government procurement involves the acquisition of goods, services and works by government agencies to fulfil their public service obligations (Fourie & Malan 2020). The goods, works and services delivery refers to the construction of roads, ports and services for residents living in communities and metropolitan areas of a country, including healthcare and education (Mothibi 2020). Procurement in the public sector encompasses a wide range of activities, from planning and budgeting to tendering, contract management and supplier evaluation (Fourie 2018). The process aims to promote value for money, economic growth and delivering quality public services through the strategic management of public funds (Hegarty & Maubrey 2021). It plays a pivotal role in promoting good governance and ensuring the effective and efficient allocation of public resources (Mojaki et al. 2024). South Africa's public procurement system is guided by principles of fairness, transparency and cost-effectiveness (Fourie & Malan 2020). With the aim of ensuring that public funds are spent responsibly and that procurement processes are accessible to a wide range of suppliers. The government's commitment to fair procurement practices also includes policies promoting supplier diversity (Wright, Conley & Sarter 2024), supporting small and medium-sized enterprises (SMEs) and empowering historically disadvantaged groups (Ambe & Badenhorst-Weiss 2012).

The adoption of e-procurement in the public entities

The adoption of e-procurement in public entities signifies a transformative shift towards streamlined, transparent and efficient procurement processes, enabling these entities to enhance their operational effectiveness and service delivery. Scholars such as Maepa et al. (2023) and Rukuni et al. (2020) argue that public entities, including state-owned enterprises and government departments, could benefit significantly from adopting e-procurement. The automation of procurement could streamline steps, reduce paperwork, and improve overall processing speed. E-procurement streamlines procurement processes by digitising them, reducing delays commonly caused by traditional paper-based methods and accelerating the acquisition and delivery of critical public goods (Afolabi et al. 2022).

Research further suggests that paper-based procurement introduces bottlenecks in the procurement cycle because of manual processes, which are time-consuming and prone to errors (Chen et al. 2021; Flechsig et al. 2022). These delays in processing, approval and record-keeping can hinder the timely provision of goods and services essential to public welfare. In contrast, e-procurement enables real-time tracking, faster approvals and improved data accuracy (Richard 2021). These allow public entities to respond more swiftly to community needs and market demands.

Moreover, the South African National Treasury (2015) has introduced a centralised e-procurement portal that includes e-Tender and Central Supplier Database (CSD), mainly to address the weakness of the traditional procurement and to promote transparency, accountability and efficiency. The automation of procurement tasks also cuts administrative costs, freeing up resources that public entities can allocate to other essential services (Kazantsev et al. 2020). This shift not only modernises the public procurement landscape but also aligns with global trends in digital governance.

Factors affecting the adoption of e-procurement

Information technologies have revolutionised how supply chains manage transactions. One such change is e-procurement, which is a web-based system that utilises digital technologies to automate and streamline the procurement cycle. This includes supplier selection, bidding,

ordering, payments and contract management (Ikram, Afaf & Latifa 2024). Furthermore, the systems demonstrate measurable improvements across operational efficiency, cost reduction and transparency, with specific benefits including faster processing times, substantial cost savings and enhanced accountability (Ibem et al. 2016).

The adoption of e-procurement varies significantly across organisational and national contexts, influenced by a range of internal and external factors. Internal factors include top management support, staffing levels and technological readiness (Maepa et al. 2023; Waithaka & Kimani 2021). External influences such as political conditions, socio-economic factors and regulatory frameworks also shape adoption outcomes (Zulkarnain, Muda & Kesuma 2023). In the South African context, studies have identified drivers such as improved information flow, operational benefits and market competitiveness as influential in adoption decisions (Duma 2018; Mgidlana 2013; Myataza 2015). Ibem and Laryea (2015) and Daoud and Ibrahim (2019) further highlighted efficiency and ease of use as key motivating factors, while Ronald and Omwenga (2015) emphasised improvements in job performance and the reduction of geographical limitations.

Organisational factors

Procurement accounts for a substantial portion of organisational expenditure, prompting many organisations to invest heavily in streamlining procurement operations (Mwita, Mwaighacho & Azanlerigu 2017). Organisational factors such as policies, size and culture play a critical role in shaping how these operations are managed (Muriithi & Senelwa 2018). Mukulungui (2016) further emphasises that these factors can act as both enablers and constraints, proactively influencing operational performance and the effective utilisation of organisational resources.

As businesses increasingly digitise their operations, significant investments are being made in information technology (IT) infrastructure, with e-procurement emerging as a key area of focus. The adoption of e-procurement is often driven by the perceived benefits of accessing broader markets and improving procurement efficiency (Ibem et al. 2017). Mushi and Nsimbila (2022) identify organisational structure, employee empowerment, collaboration and broader organisational characteristics as primary indicators of successful e-procurement adoption. Similarly, Rahman et al. (2021) highlight the importance of organisational structures that facilitate open communication between management and employees, suggesting that effective internal communication can significantly ease the transition to new technologies.

Waithaka and Kimani (2021) imply that organisations with strong internal frameworks and inclusive communication channels are better positioned to adopt e-procurement. Ultimately, the interplay between an organisation's operational environment, structural characteristics and the features of the e-procurement technology itself influences the likelihood and success of adoption.

Environmental factors

Environmental factors are external forces that strongly influence strategic decisions and the adoption of innovations such as e-procurement (Altayyar & Beaumont-Kerridge 2016). These factors include competitive pressure, peer influence, supplier readiness and technology capabilities (Alomar & Visscher 2017; Zulkarnain et al. 2023). All of which can encourage the adoption of electronic procurement systems. Organisations often benchmark their practices against those of their counterparts and adoption decisions are frequently influenced by trends within their industry. As Daoud and Ibrahim (2018) observe, firms are more likely to embrace e-procurement when they perceive a similar commitment among peer organisations. This creates competitive pressure, where companies feel compelled to adopt digital procurement systems not only to maintain operational parity but also to avoid falling behind in innovation and efficiency.

Supplier readiness and market demand further reinforce the push towards e-procurement adoption. Studies by Mgidlana (2013) and Lutfi, Idris and Mohamad (2016) underscore the role of supplier capabilities in facilitating a seamless transition to digital systems. When suppliers are technologically equipped, the integration between buyers and sellers becomes more efficient, enhancing overall supply chain performance and reducing friction in procurement workflows (Albinkhalil & Razzaque 2021).

In addition to external pressures, the pursuit of operational efficiency, business flexibility and cost-effectiveness motivates organisations to adopt e-procurement. Muriithi and Senelwa (2018) note that digital platforms support process automation, facilitate electronic trading and improve market access. By transitioning from manual to digital processes, organisations can enhance responsiveness, minimise errors and streamline operations – key advantages in today's competitive and fast-paced business environment.

Furthermore, global technological advancements are reshaping business expectations, prompting firms to adopt information systems to stay aligned with market developments. According to Ibem et al. (2016), the widespread diffusion of information technologies compels organisations to modernise their operations. Althabatah et al. (2023) also highlight that accessible and user-friendly technologies reduce the barriers to adoption, leading to higher user acceptance, lower training costs and faster realisation of e-procurement benefits.

Technological factors

Access to adequate technical resources is essential for the effective adoption of information systems, as these resources

provide the foundation upon which such systems operate and integrate into organisational workflows. Chen and Guo (2015) argue that the availability of technical resources determines an organisation's ability to implement and sustain information systems effectively. Without sufficient technical capacity, organisations face obstacles in achieving the benefits that information systems offer (Owuor & Mbaya 2022), such as streamlined processes, improved data accuracy and enhanced decision-making capabilities.

Daoud and Ibrahim (2019) highlight that an organisation's level of technical innovation and readiness for technology adoption are key drivers of e-procurement implementation. Technology readiness reflects the extent to which an organisation is prepared to support and integrate new systems, making it a crucial determinant of successful adoption (Maepa et al. 2023). Furthermore, organisational perceptions of technology play a significant role; positive attitudes towards innovation, often shaped by supportive leadership and a culture open to change, can accelerate adoption, while negative views may hinder progress (Zhu 2015).

According to Laryea et al. (2014), the state of an organisation's IT infrastructure significantly impacts its ability to adopt e-procurement. Information technology infrastructure plays a crucial role in supporting e-procurement adoption and implementation across organisations. Key components include software, hardware and network systems that enable integration of procurement functions and enhance operational efficiency (Gupta & Narain 2012). Effective IT infrastructure management involves optimising performance, scalability and reliability through proactive inspections, robust security measures and efficient resource allocation (Singh, Sharma & Saini 2019).

Management support

Top management support is widely recognised as a critical factor in the successful adoption and implementation of e-procurement across various industries and national contexts. Leadership commitment not only provides strategic direction but also ensures the allocation of essential resources and alignment with broader organisational goals (Davil et al. 2023). Senior executive engagement is a key antecedent to overcoming resistance and promoting employee engagement in the shift towards digital transformation (Issah, David & Eric 2024).

Furthermore, effective top management support involves not only endorsement but also concrete actions such as funding implementation, providing staff training and ensuring adequate IT infrastructure (Egwim, Dike & Nmecha 2024). When leaders visibly champion e-procurement, it reinforces the strategic value of the initiative across the organisation (Issah et al. 2024), signalling its importance and long-term benefits, including improved efficiency, cost savings and enhanced transparency in procurement processes.

Government mandate and regulations

The government plays a pivotal role in fostering economic growth and maintaining a functional society by providing essential services and ensuring a stable economic environment. One critical aspect of this role is the procurement of goods and services, which not only supports government functions but also fuels a substantial part of the national economy. Government procurement represents a significant percentage of public spending and directly impacts the economic performance of a country. As noted by Anthony (2018), a large portion of national economic activity is tied to government procurement, underscoring its influence on economic stability and development.

To ensure that public funds are used effectively, governments aim to achieve optimal value for money in procurement. This approach ensures that the resources invested in goods, services and infrastructure deliver maximum benefit to the public. E-procurement, as Anthony (2018) highlights, is a strategic reform that reflects the government's commitment to transparency, accountability and good governance. By implementing e-procurement, governments can minimise inefficiencies and curb corruption, thus promoting fair competition and strengthening public trust. The digitisation of procurement processes not only streamlines operations but also enhances accountability by providing a transparent record of transactions and supplier engagements.

Furthermore, the government's role extends to setting and enforcing regulations and guidelines that shape the procurement environment. These regulations are designed not only to achieve operational goals but also to establish ethical standards, promote fair conduct and instil accountability within public service. According to Sithole (2017), these rules serve to communicate the government's expectations for public sector conduct, emphasising integrity and ethical behaviour in procurement activities. By mandating these standards, the government reinforces its commitment to a procurement system that is equitable, transparent and aligned with the broader objectives of good governance.

Barriers to adopting e-procurement in an organisation

The adoption has taken centre stage in the management of an organisation's supply chain, including the Ethekwini Municipality and the Western Cape Provincial Treasury, where it has transformed supply chain networks, enabling organisations to streamline their procurement processes (Chopra & Meindl 2016). Furthermore, by facilitating efficient procurement, coordination, cooperation and information exchange between supply chain partners, e-procurement technologies aid in the integration of the procurement process throughout the supply chain (Monczka et al. 2020). Mose, Njihia and Peterson (2013) state that electronic procurement has emerged as one of the most successful applications of electronic commerce, implemented by numerous companies

seeking to improve their operational processes. Furthermore, Kamotho (2014) argues that the e-procurement movement is quite extensive, including taking strategic actions, and may be utilised to reorganise the entire purchase process. However, Osei-Tutu et al. (2019) state that despite the potential benefits of the implementation of e-procurement, the process of adopting the system has revealed various barriers and continues to be more complex.

Wahyuni et al. (2020) emphasise that the state of organisation culture, Duma (2018) points out that the level of education and technology, while Mgidlana (2013) states that suppliers and customers' perspectives have an impact on the use of e-procurement. The adoption of e-procurement is a relatively new theme of development in many business applications. Literature (Ibem & Laryea 2015; Laryea et al. 2014; Nawi et al. 2016; Rukuni et al. 2020) has shown that the implementation and adoption of e-procurement is prone to potential challenges as a result of organisations' readiness, top management support, lack of procurement skills, internal support, such as employee resistance to change, investment in software installation and security systems, among others. The following are other barriers associated with adopting the electronic procurement system, as supported by the various authors (Innocent & Kalaskar 2016):

- Ineffective administration can undermine procurement procedures, even when numerous rules and guidelines are in place to promote fairness and transparency. This often results in challenges that compromise open, competitive, and transparent procurement processes, which are fundamental to good governance and sound financial.
- Organisations have difficulties in executing the digital transformation because of end-user comprehension and acceptance of technology, as well as their readiness to change internal business procedures.
- Unstable information technology systems can cause disruptions such as network failures, resulting in delays and missed deadlines.
- A lack of security measures where critical information might potentially be stolen through well-known computer scams.
- Compatibility issues with partners in the supply chain and other external parties, where external parties are unwilling to cooperate electronically. This challenge is also attributed to the lack of education on technology systems and the inadequate IT infrastructure of suppliers. In this case, the issues make it difficult for suppliers to engage and understand the system processes, making it difficult for auditors to predict the fairness that organisations are willing to avoid.
- High investment costs for software applications, where organisations are unable to afford and invest in new software. In addition, there is a lack of adequate IT software that will carry out the e-procurement processes.
- A lack of expertise and understanding in e-procurement: Mostly personnel-related concerns, such as older generations that have not kept up with advancements in IT-related industries, but who still rely significantly on conventional forms and methods of procurement.

- A lack of flexibility in the paperwork and procedure: Many organisations cannot manage with the enormous amounts of paperwork involved in the approval of purchase order processes, invoice payments and procurement procedures. The procedure of filing and storing invoices related paper burdens organisations with increasing document storage costs. Additionally, because they were based mostly on manual operations, the methods for settling invoices were incredibly inefficient.
- Failure to comply with an organisation's culture and objectives: Challenges include a lack of a defined company philosophy, a solution that is not universally accepted, a lack of leadership, rigid central control, reluctance to change and poor information quality, to name a few.

Benefits associated with adopting e-procurement

As a result of the adoption of procurement cycle automation, private and public organisations have approached the adoption of e-procurement to make the supply chain functions more observable (Kumar & Singh 2018). Various sectors around the world have embraced the implementation of e-procurement, such as Kenya Mandala, Renson and Kipketer (2024); Nigeria (Adebayo & Evans 2015); Malaysia (Nawi et al. 2017); Ghana (Osei-Tutu et al. 2019) and in South Africa (Duma 2018; Ibem & Laryea 2015; Mothibi 2020) for the acquisition of products and services from suppliers. This will establish a competitive, equitable and good value for money, with a transparent environment.

Marei (2022) emphasises that e-procurement enables organisations to streamline supply chain processes, eliminates duplicates and errors, has an auditable track of transactions, reduces turnaround time and lowers business costs. Given the benefits, organisations stand to benefit when adopting e-procurement; most of them should have adopted them (Ibem & Laryea 2015; Mgidlana 2013). Additionally, the adoption of an electronic procurement system expands the range of services that can be offered while simplifying supply chain activities. E-procurement has gained significant technological advances in recent years and is now commonly used in the 21st century.

Daoud and Ibrahim (2019) argue that the adoption of electronic procurement has been proven to benefit the organisation in various ways, such as creating competitive advantages and increasing competition in the market. With the implementation of e-procurement, buying and selling transactions are more efficient in terms of time and cost (Mafini, Dhurup & Madzimure 2020). The following are the benefits of having an effective e-procurement (Mgidlana 2013; Mose, Njihia & Magutu 2013; Mpehle & Mudogwa 2020):
- With the implementation of e-procurement, the platform makes it possible to buy goods and services locally and from around the world, eliminating geographical barriers.

- The e-procurement allows the organisation to be more effective and conveniently keeps track of all the tasks and services provided.
- The use of an e-procurement improves supplier engagement and enhances accountability in works and services.
- Electronic document delivery is quicker than the more time-consuming paper-based procedures, and the e-procurement lowers procurement expenses.
- Using an e-procurement reduces information reliability problems, inaccuracies and human data entry mistakes.
- that have embraced the adoption of e-procurement have seen decreased maverick spending.
- With the use of e-procurement, organisations can streamline the procurement and logistics processes that were previously carried out in each location where the company conducted business.
- E-procurement enables improved management and better supplier control; in other words, buyers can find the suppliers with the best pricing and quality.
- Internal control procedures are facilitated and accelerated.
- The benefits of e-procurement include the centralised system that assists organisations with monitoring of spending expenses, involving the suppliers in the purchasing process, while developing a stronger relationship with them.

Doherty, McConnell and Ellis-Chadwick (2013) further endorsed that firms that have adopted the e-procurement have seen improvement in the organisation's performance, where all valid invoices were able to be paid within 30 days. Mgidlana (2013) further argues that while streamlining operational procedures, e-procurement provides management the ability to better manage the business. Furthermore, Mose et al. (2013) state that major changes in the operation and status of organisational procurement have been prompted by the introduction of the Internet as a platform for business systems. Furthermore, the significant use of e-procurement has no time limitation and can be used at any time of the day if the Internet is connected. Moreover, the system should set up checkpoints where the flow of orders across the system is traceable.

Methodology

Research design and sampling

The study utilised quantitative methods and purposively targeted the Mpumalanga Provincial Treasury, specifically the supply chain, ICT and finance departments. These departments were deliberately chosen because they directly form part of the core units involved in the planning, implementation and management of the procurement systems. This approach was suitable because the study focused on understanding adoption factors within the departments that have the most relevant expertise and decision-making authority. Mgoduka, Kaseeram and Heeralal (2024) state that it is crucial to select a population that best understands the research under investigation because it increases the likelihood of being a success.

Probability purposive sampling was used to realise a sample size of 35 respondents, as shown in Table 1. A questionnaire served as the primary data collection instrument for this study, which was distributed to 3 sections of the provincial treasury with a sample unit of 35 respondents. According to Krejcie and Morgan (1970), a sample size of 30 or more is generally sufficient to provide a reliable representation for statistical analysis in social science research. Therefore, the chosen sample size meets the threshold for quantitative inquiry while ensuring that data were collected from the most knowledgeable units.

Data collection tool

This study used a structured questionnaire survey to collect data. Data gathering through questionnaires is efficient because it is straightforward and rapid (De Vos et al. 2011). The questionnaire was printed and hand-delivered to the respondents, who then filled it in and returned it. Although the questionnaire was expected to be completed in 5 min, the respondents were allowed to complete it in a week. With this exception, the researcher understands that respondents need to set aside time to finish the survey to avoid interfering with their work routine. The questionnaire was linked to the objective of the factors affecting the adoption of e-procurement in the Mpumalanga Provincial Treasury.

Data from the questionnaire survey were administered and analysed using the Statistical Package for Social Sciences (SPSS) version 28.0. The questionnaires collected went through screening in order to assist the researcher in analysing and interpreting the data effectively. The descriptive statistics were analysed to describe the quantitative and fundamental characteristics of the data obtained (Du Plooy-Cilliers & Bezuidenhout 2014). The statistics used in the study include descriptive statistics, mean scores, standard deviation (SD) and mean ranking, as shown in Table 2. Furthermore, the Cronbach's alpha calculations were performed to test the consistency (Pallant 2016). Amirrudin, Nasution and Supahar (2021) state that Cronbach's alpha coefficients represent the most widely used measure for identifying a research instrument's reliability. Eight items associated with the factors affecting the e-procurement adoption were analysed, as shown in Table 3. The value obtained was 0.7; therefore, it is considered reliable as recommended by Goforth (2015). Furthermore, the study utilised a five-point Likert scale, ranging from 1 'strongly disagree' to 5 'strongly agree' as indicated in Figure 1.

Data analysis and findings

This table analyses key factors influencing e-procurement adoption, based on responses from 33 participants. Each factor

TABLE 1: A breakdown of a sample size.

Purposive sampling	Sample size
Supply chain and procurement section	14
Finance section	9
ICT section	12

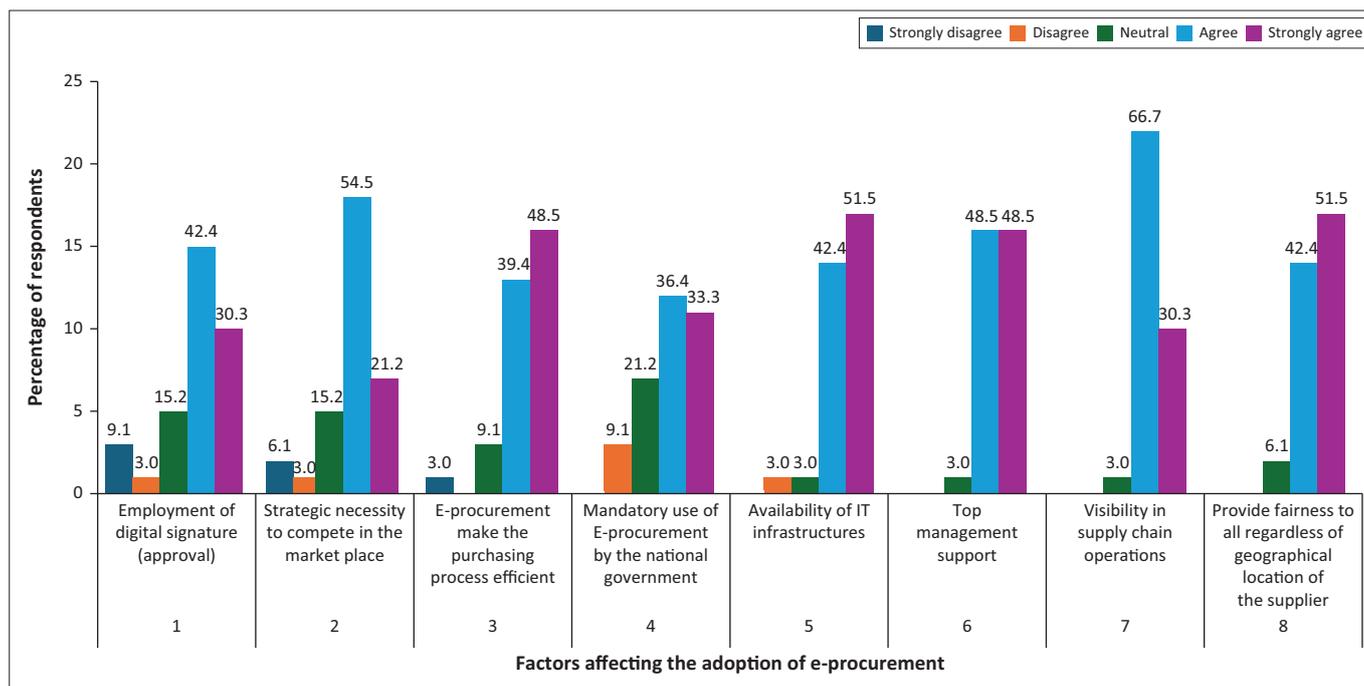ICT, information and communication technology.

FIGURE 1: The five-point Likert scale table.

TABLE 2: Descriptive statistics: Factors affecting the adoption of e-procurement (N = 33).

Items details	Mean	Standard deviation	Mean ranking
Employment of a digital signature (approval)	3.82	1.18	6th
The strategic necessity to compete in the marketplace	3.82	1.01	6th
E-procurement makes the purchasing process efficient	4.30	0.88	3rd
Mandatory use of e-procurement by the national government	3.94	0.97	5th
Availability of IT infrastructures	4.42	0.71	2nd
Top management support	4.45	0.56	1st
Visibility in supply chain operations	4.27	0.52	4th
Provide fairness to all, regardless of the geographical location of the supplier	4.45	0.62	1st

Note: SPSS version 28.0.

IT, information technology.

TABLE 3: Cronbach's alpha table for reliability.

Cronbach's alpha	Number of items
0.7	8

Note: SPSS version 28.0.

is rated on a scale, with higher mean values indicating greater perceived importance. The SD shows the variability in responses, and the mean ranking highlights each factor's relative importance in driving e-procurement adoption:

- **Top management support:** Ranked first with a mean of 4.45 and the lowest SD (0.564), this factor highlights the essential role of leadership in encouraging e-procurement adoption. The low variability indicates consensus among respondents on its critical importance.
- **Fairness in supplier access regardless of location:** Also ranked first (mean of 4.45, SD 0.617), this factor reflects the significance of creating an equitable procurement environment. It underscores the value placed on inclusivity in supplier selection, which e-procurement facilitates by overcoming geographic barriers.
- **Availability of IT infrastructure:** With a mean of 4.42 and ranked second, the availability of robust IT infrastructure is seen as foundational to e-procurement success.

This result indicates that respondents recognise that without the necessary technology in place, e-procurement cannot be effectively implemented.

- **Efficiency in the purchasing process:** Ranked third with a mean of 4.30 and SD of 0.883, respondents consider the operational efficiencies offered by e-procurement as highly beneficial, reducing time and resource demands associated with traditional procurement methods.
- **Visibility in supply chain operations:** Scoring a mean of 4.27 and ranking fourth, visibility indicates the value e-procurement brings in improving transparency and oversight across supply chain activities. The relatively low SD (0.517) shows general agreement on this advantage.
- **Mandatory use by national government:** With a mean of 3.94, ranked fifth, and a SD of 0.966, this factor underscores the importance of regulatory support in e-procurement adoption. Government mandates drive public sector compliance, reinforcing the system's adoption.
- **Employment of digital signatures (approval):** Ranking sixth with a mean of 3.82 and SD 1.185, this factor reflects moderate importance. Digital signatures are key to maintaining secure and efficient approval processes, although responses varied, suggesting differing views on their relative priority.
- **Strategic necessity for market competitiveness:** Also ranked sixth, with a mean of 3.82 and SD 1.014, respondents see e-procurement as strategically beneficial for maintaining competitiveness. However, the variability suggests mixed perspectives on how critical it is relative to other factors.

The Likert scale results reveal participants' agreement on key factors affecting the adoption of e-procurement, with percentages reflecting the level of consensus on each factor's impact. The high agreement levels indicate that participants recognise these factors as significant to the e-procurement process, although the degree of importance varies across factors:

- **Visibility in supply chain operations (66.7%):** This factor received the highest level of agreement, suggesting that participants see increased transparency as a crucial advantage of e-procurement. Visibility allows real-time tracking and monitoring, which can lead to better decision-making, reduced inefficiencies and enhanced supply chain coordination. Jafari and Fakhrzad (2015) emphasise the role of visibility in improving operational effectiveness, aligning with participants' responses.
- **Strategic necessity for market competitiveness (54.5%):** More than half of the respondents view e-procurement as essential for maintaining competitiveness. This reflects the belief that adopting e-procurement allows organisations to streamline processes, reduce costs and respond more effectively to market changes, positioning them favourably within their industry.
- **Availability of IT infrastructures (51.5%):** A key enabler, IT infrastructure availability, is seen as necessary for supporting e-procurement. This moderate level of agreement suggests that participants recognise the foundational role of technology, but may also imply that not all organisations have fully developed infrastructures, affecting implementation success.
- **Fairness to suppliers regardless of location (51.5%):** The idea that e-procurement fosters equal opportunities for suppliers across locations indicates an awareness of the inclusivity benefits of digital systems. By reducing geographic barriers, e-procurement expands the supplier pool, potentially enhancing procurement terms and encouraging supplier diversity.
- **Improvement in purchasing process efficiency (48.5%):** Nearly half of the respondents believe e-procurement enhances purchasing efficiency. This reflects a recognition of e-procurement's potential to automate and simplify processes, although some variability in responses suggests differing perspectives on how effectively these benefits are realised.
- **Top management support (48.5%):** Support from leadership is acknowledged as essential, as it ensures that e-procurement initiatives receive necessary resources and alignment with organisational goals. The moderate agreement indicates an understanding of leadership's influence, although it may also signal variability in perceived commitment levels among organisations.
- **Employment of digital signatures (42.4%):** Digital signatures facilitate secure, verifiable transactions within e-procurement. Although important, the lower agreement rate suggests this factor may be viewed as a technical requirement rather than a primary driver of adoption.
- **Mandate by national government (36.4%):** The relatively low level of agreement suggests that while government mandates can drive adoption, participants may perceive other factors, such as operational benefits and competitiveness, as more directly influential.

Discussion

This study investigated the factors influencing the adoption of e-procurement in the Mpumalanga Provincial Treasury, guided by the South African National Treasury (2015) framework on departmental adoption. The identified factors include organisational, environmental, technological, management support and government mandate considerations. Government procurement is central to public service delivery, economic development and good governance, as it ensures value for money, transparency and supplier diversity (Fourie & Malan 2020). In South Africa, the shift towards e-procurement has been introduced to address inefficiencies of traditional paper-based systems, promoting accountability, speed and cost-effectiveness in procurement processes (National Treasury 2015).

Based on the findings from this study, respondents identified top management support as a critical factor influencing the adoption of e-procurement in the Mpumalanga Provincial Treasury. Leadership commitment plays a pivotal role in driving organisational change and ensuring adequate resources are allocated for technological adoption (Gunasekaran & Ngai 2008). Without strong managerial backing, the implementation of e-procurement often faces delays, resistance or under-utilisation (Vaidya, Sajeev & Callender 2006). In the South African public sector context, top management support is essential for aligning procurement practices with national policies such as the *Public Finance Management Act (PFMA)* and National Treasury guidelines (Ambe & Badenhorst-Weiss 2012). Senior leaders also influence organisational culture, which directly affects employee willingness to embrace digital systems (Davila, Gupta & Palmer 2003). Moreover, management endorsement ensures the provision of training, capacity building and infrastructure investment necessary for system adoption (Nwankpa & Roumani 2016).

The findings from this study identified that the adoption of e-procurement makes the purchasing process more efficient while also promoting fairness across suppliers regardless of geographical location. Efficiency gains stem from process automation, faster information sharing and improved coordination, which minimise administrative delays and transaction costs (Maepa et al. 2023). The fairness dimension is enhanced through equal access to tender information, thereby reducing the risk of favouritism and promoting supplier diversity (Mothibi 2020). In the South African context, e-procurement also addresses long-standing challenges of uneven access to procurement opportunities, particularly for small and rural enterprises, by allowing equal participation through digital platforms (Masuku & Hlongwane 2022). Scholars

further note that e-procurement strengthens accountability and combats corruption by making processes more transparent and traceable (Molepo & Jahed 2022). By enabling inclusivity, transparency, and improved efficiency, e-procurement directly contributes to enhancing procurement performance and achieving broader socio-economic development objectives (Mojaki et al. 2024).

Furthermore, the mandatory use of e-procurement by the government has been identified as a significant factor influencing its adoption. The South African National Treasury has introduced e-procurement as part of its strategy to enhance transparency, efficiency and accountability in public procurement (National Treasury 2015). However, despite the existence of these policy directives, many government departments remain slow to transform (Ambe & Badenhorst-Weiss 2012). Scholars argue that while regulatory pressure can accelerate adoption, compliance alone is insufficient without adequate change management and organisational readiness (Vaidya et al. 2006). Resistance to change, limited capacity and a lack of technical expertise often undermine the effectiveness of mandatory policies (Gunasekaran & Ngai 2008). In addition, bureaucratic structures and entrenched procurement practices tend to delay the transition to digital systems (Raymond 2008). This creates a gap between policy intentions and practical implementation, resulting in uneven adoption across departments. International evidence also shows that coercive mandates require complementary support such as training, funding and system integration to be effective (Neupane, Soar & Vaidya 2012). Therefore, while government mandates are necessary to institutionalise e-procurement, they must be reinforced by capacity-building measures to achieve sustainable adoption (Walker & Brammer 2009).

Moreover, IT infrastructure has been identified as a critical factor influencing the adoption of e-procurement. Adequate technological infrastructure ensures the smooth implementation, operation and integration of digital procurement systems (Gunasekaran & Ngai 2008). Robust hardware, software and network capabilities are essential for system reliability and security, which are key concerns in public sector adoption (Vaidya et al. 2006). Studies show that departments with limited IT resources often experience delays, system downtime and poor user acceptance, which undermine adoption efforts (Ambe & Badenhorst-Weiss 2012). The presence of scalable and compatible IT infrastructure also facilitates real-time data processing, reporting and monitoring, enhancing transparency and efficiency in procurement (Davila et al. 2003). Furthermore, IT readiness is closely linked to organisational capacity and staff competence, as sophisticated systems require skilled personnel to operate and maintain them (Nwankpa & Roumani 2016). Without adequate infrastructure, even well-designed e-procurement can fail to deliver intended benefits (Neupane et al. 2012). Hence, investment in IT infrastructure is not only a technical requirement but also a strategic enabler for successful e-procurement adoption in government departments (Raymond 2008).

Recommendations

The Mpumalanga Provincial Treasury needs to encourage the use of technologies among its employees. The department should invest in a durable IT infrastructure that can also help the department protect its sensitive data and information from cyber threats, such as hacking, malware and phishing attacks. This can help reduce the risk of data breaches and other security incidents that could damage the department's reputation and operations.

Conclusion

The use of digital technology is critical in the public sector. E-procurement is more than just an internet purchasing system. The use of the system would result in substantial advantages, particularly cost savings and increased productivity, as well as an improvement of the supply chain principles, such as transparency, equity, fairness, competition, and, most importantly, value for money. Infrastructure accessibility, including that of ICT, is something the treasury could focus on more if it wants to adopt e-procurement effectively. Furthermore, the department should invest in ICT champions to block cyberattacks and hacking. The Mpumalanga Treasury should concentrate its efforts on several key and essential areas, such as enhancing corporate communications, streamlining business processes and reducing costs and cycle times, exploring new markets and business prospects, increasing contract clarity and overall competitiveness in the implementation of the e-procurement. Through easy access to pertinent information about each procurement process, this system will assist the department in making more informed and precise decisions. Furthermore, the implementation of the system will reduce the potential duplication of documents. Furthermore, e-procurement is frequently viewed as a solution to inefficiencies and cost overruns in conventional procurement processes because it automates and tracks operations with minimum human interaction.

This study illuminates the perceived factors that influence the adoption of e-procurement in the Mpumalanga Provincial Treasury. The findings of the research provide useful information on the challenges and opportunities associated with the implementation of e-procurement in public sector organisations. One of the key findings of the study is that perception of organisational readiness plays a decisive role in adopting e-procurement. Participants in the study identified factors such as support from top management, sufficient resources and qualified personnel as essential to successful implementation. These conclusions highlight the importance of organisational preparation and the need for strategic planning and investment in e-procurement initiatives.

In addition, the study identified the perceived benefits as another factor that has an influence on the adoption of electronic procurement. Participants recognised benefits such as improved efficiency, cost reduction, increased transparency and reduced corruption. These advantages are recognised as the driving force behind the adoption of electronic procurement

systems and recognise the possibility of simplifying procurement processes and improving results. However, the study also revealed some perceived obstacles and challenges to the adoption of electronic procurement. Participants expressed concern about resistance to changes, a lack of technological infrastructure, inadequate training and security risks. These results highlighted the importance of dealing with these obstacles to promote a positive adoption environment. Organisations should invest in change management strategies, provide adequate training and support and implement robust security measures to address these challenges.

Based on these findings, the adoption of e-procurement in the Mpumalanga Provincial Treasury is influenced by a complex interplay of organisational, internal and external factors. To promote successful adoption, the Treasury should focus on building organisational readiness, addressing perceived barriers and leveraging perceived benefits. In addition, collaboration with suppliers and other stakeholders, along with adherence to legal and regulatory frameworks, will contribute to the effective implementation and sustainability of e-procurement. It is important to acknowledge the limitations of this study. The study was conducted within a specific context, and the findings may not be generalisable to other organisations or regions. In conclusion, this study has contributed to understanding the factors that influence the adoption of e-procurement in the Mpumalanga Provincial Treasury. The findings provide valuable information that can inform policymakers, managers and practitioners in their efforts to implement and maximise the benefits of e-procurement.

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Competing interests

Authors' contributions

This article was developed from L.S.N.'s MCom Supply Chain dissertation under the guidance of E.D.N. L.S.N. carried out the conceptualisation, methodology, data collection, analysis and drafting of the manuscript. The work was written with the academic guidance, supervision and critical input of E.D.N. from the initial draft through to the revision of review comments.

Ethical considerations

Ethical approval for this study was obtained from the Humanities and Social Sciences Research Ethics Committee (HSSREC) of the University of KwaZulu-Natal on 28 November 2023 (HSSREC/00005050/2022).

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Data availability

The data that support the findings of this study are not openly available because of reasons of sensitivity and are available from the corresponding author, L.S.N., upon reasonable request.

Disclaimer

The views and opinions expressed in this article are those of the authors and are the product of professional research. They do not necessarily reflect the official policy or position of any affiliated institution, funder, agency, or that of the publisher. The authors are responsible for this article's results, findings and content.

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