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Factors Influencing the Adoption of E-Procurement among Small Scale Businesses in North Western Province of Zambia

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Abstract

E-procurement refers to the use of electronic methods and systems to conduct transactions and manage procurement processes. It leverages internet-based solutions to facilitate the procurement of goods and services, aiming to enhance efficiency, reduce costs, and improve transparency in procurement activities. This study investigates the factors influencing the adoption of e-procurement among small-scale businesses in Zambia, focusing on the North-Western Province. Utilizing a quantitative research approach, data was collected through structured questionnaires distributed to 375 small-scale businesses, achieving a response rate of 80%. The analysis revealed significant insights into the adoption dynamics of e-procurement systems. The regression analysis indicated that management commitment, supplier relationships, cost of electronic infrastructure, regulatory compliance, and technological infrastructure significantly influence the adoption of e-procurement among small-scale businesses. The results showed that management commitment ($\beta = 0.45$, $p < 0.01$) and supplier relationships ($\beta = 0.32$, $p < 0.01$) were the strongest predictors of e-procurement adoption. The cost of electronic infrastructure ($\beta = 0.28$, $p < 0.05$) and regulatory compliance ($\beta = 0.25$, $p < 0.05$) also positively influenced adoption rates, while technological infrastructure ($\beta = 0.20$, $p < 0.05$) was found to be a significant factor as well. Based on these findings, several recommendations are proposed to enhance e-procurement adoption among small-scale businesses. First, fostering strong leadership commitment is crucial, and businesses should invest in training programs to build managerial capacity. Second, developing robust supplier relationships through collaborative networks can facilitate smoother integration of e-procurement systems. Third, policymakers should consider providing financial incentives or subsidies to reduce the cost burden of electronic infrastructure for small businesses. Fourth, there is a need for clear and supportive regulatory frameworks to encourage compliance and trust in e-procurement systems. Finally, improving technological infrastructure, including reliable internet connectivity and access to modern IT resources, is essential to support the digital transition.

Keywords: E-Procurement, Small-Scale Businesses, Technological Infrastructure Government Regulations, Digital Procurement, SMEs, Zambia.

Introduction

The adoption of E-Procurement among small-scale businesses in Zambia is a critical area of study as electronic procurement systems have become increasingly prevalent globally, transforming traditional procurement processes (Mwebesa, 2016). In the context of small

and medium-sized enterprises (SMEs), understanding the factors influencing the adoption of E-Procurement is particularly important, given their unique operational dynamics and resource constraints (Jama et al., 2024b). The significance of this research is underscored by the evolving landscape of business operations, where technology plays a pivotal role in enhancing efficiency, reducing costs, and improving overall competitiveness (Kabanda and Chisela, 2018).

Several studies conducted in diverse contexts have delved into the factors that influence the adoption of E-Procurement in Small and Medium Enterprises (SMEs). For instance, research by Ali, Green, and Zutshi (2014) underscores the significance of certain factors in the decision-making process of E-Procurement adoption. According to their findings, factors such as perceived benefits, ease of use, and organizational support play pivotal roles in shaping the attitudes and choices of SMEs towards the adoption of E-Procurement systems (Ali et al., 2014).

Similarly, the study conducted by Wu, Chieh, and Chou (2015) contributes valuable insights into the determinants of E-Procurement adoption. Their research highlights the crucial role of factors such as perceived risk, compatibility with existing systems, and external pressure in influencing the decision-making process of SMEs regarding the adoption of E-Procurement systems (Wu et al., 2015). The perceived risk associated with adopting new technologies, the compatibility of E-Procurement systems with the current organizational infrastructure, and external pressures from various stakeholders all emerge as significant considerations in the adoption decision (Mwanaumo et al., 2024). Collectively, these studies contribute to a nuanced understanding of the multifaceted factors influencing the adoption of E-Procurement in SMEs across different organizational settings.

In the Zambian context, the landscape of SMEs in North-Western Province is witnessing a gradual shift toward embracing digital technologies. While larger enterprises might have greater resources to invest in and implement E-Procurement systems, small-scale businesses face unique challenges that require a tailored understanding. The current state of E-Procurement adoption among SMEs in Zambia remains relatively underexplored, necessitating a focused study to uncover the specific factors influencing their adoption decisions.

The Zambian government has taken proactive steps in fostering digital transformation and e-governance initiatives, thereby creating an environment conducive to the adoption of electronic procurement practices (Chulu & Makawa, 2017). This strategic approach aligns with global trends in leveraging technology for efficient and transparent government processes. However, despite these initiatives, the specific challenges faced by Small and Medium Enterprises (SMEs) in Zambia remain a critical aspect that requires in-depth exploration (Daka & Kaputa, 2015). SMEs, often constrained by limited financial resources, technological infrastructure, and awareness, may encounter hurdles in embracing E-Procurement practices.

In the context of Zambia, this study addresses this crucial gap in understanding the dynamics of E-Procurement adoption among SMEs. The research focuses particularly on the regions of North-Western Province, aiming to unravel the factors that either facilitate or hinder the adoption of E-Procurement in these areas. By conducting a comprehensive analysis, this study contributes valuable insights to the existing body of knowledge on E-Procurement adoption within the SME sector, shedding light on the unique challenges faced by businesses in Zambia. The outcomes of this research not only serve academic interests but also hold practical implications for policymakers, business owners, and other stakeholders in Zambia, offering actionable recommendations to enhance the effectiveness and inclusivity of E-Procurement practices in the SME landscape.

The adoption of E-Procurement among small-scale businesses in Zambia is a critical concern that requires immediate attention. According to recent statistics, the adoption rate of E-Procurement in SMEs in North-Western Provinces is notably low, with only a marginal percentage having implemented electronic procurement systems. For instance, a study conducted by Bwalya and Chisala (2021) reveals that, as of the latest available data, less than 15% of small-scale businesses in North-Western Province have adopted E-Procurement practices. This figure indicates a significant lag in the adoption of digital procurement technologies compared to global trends.

The limited adoption of E-Procurement in small-scale businesses in Zambia poses severe consequences for the industry's competitiveness and efficiency (Mwanaumo et al., 2024). According to Mutale and Tembo (2019), SMEs that do not embrace E-Procurement face challenges such as increased operational costs, slower procurement cycles, and reduced competitiveness in the market. Additionally, the absence of streamlined procurement processes may lead to inefficiencies, manual errors, and a lack of transparency, hindering overall business growth and sustainability (Jama et al., 2024b). The negative consequences of the slow adoption of E-Procurement practices threaten to exacerbate existing challenges faced by SMEs, undermining their ability to thrive in a rapidly evolving business environment.

While various studies have explored E-Procurement adoption in different contexts, there remains a significant research gap concerning the factors influencing the adoption of E-Procurement specifically among small-scale businesses in Zambia.

Existing research has predominantly focused on larger enterprises such as those done by Bwalya and Chisala (2021), and there is a scarcity of comprehensive studies addressing the unique challenges and opportunities faced by SMEs in the Zambian context. By delving into the specific circumstances of small-scale businesses in North-Western Province, this research aims to contribute to the existing body of knowledge, filling the identified research gap and providing insights that can inform tailored strategies for enhancing E-Procurement adoption in the SME sector in Zambia.

Research Objectives

i. To establish the E-procurement systems used by small scale businesses in Northwestern.
ii. To assess why SMEs are using these E-procurement systems in their businesses.
iii. To evaluate the benefits of adopting these E-Procurement by the SMEs.
iv. To determine the strategies and practices for adopting E-procurement systems by the SMEs

Literature Review

Factors Influencing the Adoption of E-Procurement among SMEs

The adoption of e-procurement among small-scale businesses in Zambia and world-over is influenced by various factors that reflect the unique context and challenges faced by these enterprises.

Financial Constraints

Financial constraints play a pivotal role in influencing the decision-making process of small-scale businesses when considering the adoption of e-procurement technologies (Verma, Pullman, & Maloni, 2019). The lack of financial capacity limits their ability to invest in the necessary resources for successful implementation. This financial hurdle not only affects the initial stages of adoption but may also impede ongoing maintenance and upgrades, hindering the seamless integration and sustainability of e-procurement practices within small-scale businesses. Thus, addressing the financial challenges is crucial in ensuring wider and more inclusive adoption of e-procurement systems among small enterprises) (Telukdarie et al. 2022).

Technological Factors

Croom and Brandon-Jones (2017) emphasize that technological infrastructure is a critical determinant in shaping the success of e-procurement initiatives. In the Zambian context, addressing issues related to technological infrastructure becomes imperative to ensure the effective implementation of e-procurement systems. The availability of a robust and reliable technological framework is essential for overcoming barriers and enhancing the adoption of e-procurement practices among small-scale businesses.

Jap (2021) supports this perspective by highlighting the pivotal role of technological capabilities in determining the success of e-procurement adoption. In Zambia, addressing the challenges related to technological infrastructure becomes a strategic priority to empower small-scale businesses and promote the widespread adoption of e-procurement. Improving internet connectivity, computer accessibility, and overall IT infrastructure are crucial steps toward creating an enabling environment for e-procurement systems in the Zambian business landscape.

Awareness and Education

The implementation of e-procurement systems is crucial for businesses seeking to enhance efficiency and reduce costs (Kollberg & Dahlgaard, 2014). However, a significant challenge arises from the lack of awareness and understanding among small-scale businesses about the benefits and functionalities of e-procurement (Ngai et al., 2018). Many businesses may not fully comprehend how adopting e-procurement can streamline their procurement processes, leading to missed opportunities for increased efficiency (Mwanaumo et al., 2024). According to Jama et al. (2024a), such barriers are often exacerbated by a lack of top-management support and misaligned organizational structures.

To overcome this obstacle, educational initiatives and awareness campaigns become imperative (Walker & Brammer, 2019). These initiatives can provide businesses with the necessary knowledge and insights into the advantages of e-procurement, fostering a better understanding of how this technology can positively impact their operations.

Supplier Readiness

The readiness and willingness of suppliers play a crucial role in the adoption of e-procurement processes (Kabanda and Chisela, 2018). In the context of small-scale businesses, which often operate within a network of suppliers, the preparedness of these suppliers is a critical factor that influences the success of e-procurement implementation. If suppliers lack the necessary readiness and willingness to engage in e-procurement, it can pose significant challenges and resistance to the adoption of these digital processes (Sedera & Gable, 2019). Furthermore, the concept of supplier readiness extends beyond just technological capabilities. It encompasses factors such as organizational culture, training, and the overall willingness of suppliers to adapt to new procurement methods (Verma et al., 2019).

Training and Capacity Building

Training and capacity building are crucial elements for the successful integration of e-procurement systems, especially in the context of small-scale businesses (Zviran et al., 2016). Small businesses may face challenges in leveraging e-procurement tools due to a lack of expertise. Training programs play a vital role in addressing this issue by providing the necessary skills and knowledge for effective system utilization (Carter & Ellram, 2023). Without proper training, businesses may struggle with the learning curve associated with adopting e-procurement systems. In support of this, Carter & Grimm (2021) highlight the significance of capacity-building initiatives. These initiatives not only enhance the technical skills required for utilizing e-procurement systems but also contribute to a broader organizational capacity to adapt and innovate (Mwanaumo et al., 2024). Through training and capacity-building programs, businesses can empower their employees to navigate the complexities of e-procurement, thereby improving overall adoption rates and ensuring the successful implementation of these systems within the organizational framework. Thus, investing in training opportunities becomes an essential strategy to overcome barriers and

facilitate the effective use of e-procurement systems, particularly in the context of small-scale businesses.

Network Effect

The concept of network effects has been well-established in the literature as a significant driver of business success (Verma, Pullman, & Maloni, 2019). This phenomenon is particularly relevant in the context of small-scale businesses, where the influence of peer businesses and industry networks can be noteworthy (Zviran, Glezer, & Avni, 2016). According to Arif and Elavarasan (2021), the dynamics of network effects play a crucial role in shaping the adoption patterns within a business community.

Theoretical Review

Technology Acceptance Model (TAM)

This model posits that behavioral intention to use technology is influenced by perceived utility and perceived ease of use. Positive attitudes towards IT increase acceptance, as supported by empirical research (Venkatesh et al., 2023; Adams et al., 2022). This study applied TAM to understand user acceptance of a new technology. Analyzing perceived utility and ease of use helped assess the likelihood of technology adoption among participants.

Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was developed by Fishbein and Ajzen in 1975 to explain consciously intended behaviors. It posits that behavioral intentions, influenced by attitudes and subjective norms, determine behavior. This theory serves as a guide for exploring top management commitment's influence on E-procurement implementation, aligning with TRA's focus on intentional behavior.

Empirical Evidence

Research by Carter and Grimm (2021) indicates that "management commitment" significantly influences the successful implementation of e-procurement initiatives within organizations. When senior management is actively involved and committed to the adoption of e-procurement, it creates a supportive environment and provides necessary resources, which positively impact adoption rates among SMEs. According to research by Gunasekaran and Ngai (2021), strong supplier relationships can facilitate the integration of SMEs into e-procurement networks. When SMEs have positive relationships with their suppliers, they are more likely to collaborate on adopting e-procurement solutions, leading to higher adoption rates and smoother implementation processes.

The cost of electronic infrastructure is a significant consideration for SMEs when adopting e-procurement systems. According to a study by Lu et al. (2018), the cost-effectiveness of electronic infrastructure influences SMEs' decisions to adopt e-procurement solutions.

Lower costs associated with implementing and maintaining electronic infrastructure make e-procurement more attractive to SMEs, leading to higher adoption rates Regulatory compliance is an essential driver for e-procurement adoption among SMEs. Research by Ali et al. (2019) suggests that SMEs prioritize compliance with regulations and standards when considering e-procurement adoption. Meeting regulatory requirements ensures legal and operational conformity, which enhances SMEs' trust in e-procurement systems and encourages adoption (Ghobakhloo et al., 2021).

The quality and reliability of technology infrastructure significantly influence the adoption of e-procurement systems by SMEs. According to a study by Liao et al. (2017), a robust technology infrastructure supports seamless integration and functionality of e-procurement systems for SMEs.

Methodology

The research design was cross-sectional, allowing for the collection of data at a specific point in time. The choice of a cross-sectional research design is well-suited for this study as it enables the collection of data at a specific point in time, providing a snapshot of the current status of E-procurement adoption among small-scale businesses in North-Western Province. The target population comprises of over 15,000 small-scale businesses operating in North-Western Province (Zambia Development Agency (ZDA), 2023). The calculated sample size was 375, which means that a sample size of 384 small-scale businesses would be statistically representative of the population of 15,000 businesses with a margin of error of 5%. Random sampling is a crucial technique for studying the factors influencing the adoption of E-Procurement among small-scale businesses in the Northwestern Province

This did employ a questionnaire (closed ended) to collect data in the region. The literature review facilitated a comprehensive understanding of the constructs to be measured and served as a foundation for generating questionnaire items. This detailed review ensures that the questionnaire is rooted in established theories and frameworks, thereby enhancing its content validity. The study's key variables were clearly defined, and precise, relevant questions were developed to ensure that the questionnaire accurately captures the intended variables. Standard multiple linear regression analysis was employed for the data analysis.

This study is committed to upholding ethical standards to ensure the integrity and well-being of the participants involved. Informed consent, a fundamental ethical principle in research, were diligently sought from each participant. Confidentiality was rigorously maintained throughout the research process. All collected data, including responses from participants, were anonymized and stored in a secure manner, with access restricted only to authorized research personnel. The researcher obtained ethical clearance approval from the University of Zambia ethical clearance committee.

Data Analysis

Research Hypotheses

Ho1: There is a significant relationship between management commitment and E-procurement adoption by SMEs.

Ho2: There is a significant relationship between suppliers' relationship and E-procurement adoption by SMEs.

Ho3: the cost of electronic infrastructure does significantly impact E-procurement adoption by SMEs.

Ho4: There is no significant relationship between regulatory compliance and E-procurement adoption by SMEs.

Ho5: There is no significant relationship between technology infrastructure and E-procurement adoption by SMEs.

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.789	.622	.655	.294

Source: Field Survey, 2024

The model summary indicates a strong positive relationship between the predictors and e-procurement adoption, as reflected by the R square value of 0.622. This suggests that approximately 62.2% of the variance in e-procurement adoption can be explained by the independent variables: management commitment, supplier relationship, cost of the electronic system, regulatory compliance, and technological infrastructure.

Table 1b: ANOVA[a]

Model	Sum of squares	Df	Mean Square	F	Sig
Regression	6.243	5	6.243	29.305	.0001[a]
Residual	29.872	296	.213		
Total	36.115	301			

Field Survey, 2024

The model summary indicates that the regression analysis was performed on a dataset with 301 observations (df = 301), partitioned into 5 degrees of freedom for the regression and 296 for the residuals. The total sum of squares is 36.115, with the regression sum of squares contributing 6.243 and the residual sum of squares accounting for 29.872. The mean square for the regression is 6.243, while the mean square for the residuals is .213. The F-statistic is 29.305, and the associated significance value (Sig) is .0001, indicating that the regression model is statistically significant. This implies that the independent variables in the model significantly predict the dependent variable, demonstrating a strong relationship between the predictors and the outcome. The low p-value (< 0.05) confirms that the results are not due to random chance, providing robust evidence for the model's effectiveness in explaining the variance in the dependent variable. The model was therefore well-specified.

Table 1c: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig	Tolerance	VIF
1 (constant)	2.325	.120		20.556	.000		
Management	.155	.006	.168	2.583	.011	.310	3.227
Commitment Supplier relationship	.072	.043	.189	2.012	.046	.425	3.504
	.197	.075	.157	2.626	.010	.433	2.309
Cost of electronic system	.145	.085	.438	1.706	.008	.226	2.407
Regulatory Compliance	.190	.635	.277	1.202	.001	.243	2.536
Technological Infrastructure							

Source: Field Survey, 2024

The regression analysis results indicate that various factors, including Management Commitment, Supplier Relationship, Regulatory Compliance, Cost of Electronic System, and Technological Infrastructure, are critical in facilitating e-procurement adoption. The significant positive impact of Management Commitment (B = 0.155, p = 0.011) suggests that active leadership support is crucial for the successful implementation of e-procurement initiatives. This finding corroborates Kraemer and Dedrick's (2022) research, which identified top management support as essential for the effective adoption of e-procurement systems. Additionally, the significant effects of Supplier Relationship (B = 0.072, p = 0.046) and Regulatory Compliance (B = 0.145, p = 0.008) highlight the importance of solid external partnerships and compliance with legal standards, which aligns with Pearcy and Giunipero's (2018) findings on the role of supplier collaboration and regulatory factors in promoting e-procurement success.

The model's reliability is further reinforced by the absence of multicollinearity, as evidenced by Tolerance and VIF values. With Tolerance values exceeding 0.1 and VIF values remaining below 10, the results suggest that each factor independently influences e-procurement adoption without significant interdependence. This robustness is crucial as it confirms that the relationships observed are not skewed by high correlations among predictors. The positive effects of the Cost of Electronic System (B = 0.197, p = 0.010) and Technological Infrastructure (B = 0.190, p = 0.001) further support the notion that affordable and advanced technological solutions are key to adopting e-procurement systems, echoing Gunasekaran and Ngai's (2018) emphasis on the importance of cost-effective technology in supply chain management. Collectively, these results provide a comprehensive framework for understanding the strategic factors that influence e-procurement adoption, offering valuable insights for organizations seeking to implement these systems effectively.

Comparison Section

Our findings agree with Narasimhan and Das (2021), who found Management Commitment and Technological Infrastructure significant drivers of e-procurement adoption in developing economies. In their view, engagement by leadership and investment in digital infrastructure have a very strong positive impact on the effectiveness of e-procurement implementation. Furthermore, ensuring successful adoption, one finds regulatory compliance to be an important factor, as proved by our findings.

However, our study differs from that of Armistead and Machin (2021), who postulated that Supplier Relationship does not have a significant influence on the adoption of e-procurement. Contrary to the findings by Matunga et al., our analysis shows that strong collaboration with suppliers positively influences adoption, implying that in some contexts-such as industries characterized by high supplier dependence-external partnerships can be even more important. Probably, this is again because of issues in the different regulatory environments or sectoral dynamics or technological maturity across the sets of different studies.

Conclusion

The study on e-procurement systems among small-scale businesses in Northwestern Province, Zambia, reveals a varied adoption of different e-procurement solutions. The following conclusions were drawn:

i. The study concluded that the predominant use of Integrated Enterprise Resource Planning (ERP) systems by 29% of businesses underscores their appeal due to their comprehensive functionality, integrating various business processes and enhancing efficiency.

ii. The study concluded that cost savings are the primary motivator for SMEs in adopting e-procurement systems, as evidenced by the high mean score (4.78) and low standard deviation (0.780). This strong consensus aligns with previous research, confirming that financial efficiency is a critical factor driving the adoption of e-procurement. Additionally, access to a wider supplier base, scalability, and competitive advantage are also highly valued by SMEs, reflecting their strategic emphasis on market expansion and operational growth. These findings indicate that SMEs in the region view e-procurement as a tool to enhance their competitiveness and access new business opportunities, further reinforcing the importance of these systems in their operational strategies.

Recommendations

Based on the research findings, the following recommendations were proposed;

i. Enhancing Management Commitment: Senior management should be actively involved in the e-procurement adoption process. This includes providing necessary resources, setting clear goals, and continuously monitoring progress. Training

programs for management on the strategic benefits of e-procurement can also help in garnering their support.

ii. Strengthening Supplier Relationships: Building robust relationships with suppliers is crucial for the successful implementation of e-procurement systems. Businesses should invest in creating partnerships with suppliers, ensuring they are also technologically prepared and supportive of the e-procurement processes.

iii. Improving Technological Infrastructure: Investment in technological infrastructure is necessary to support e-procurement systems. This includes upgrading existing systems, ensuring reliable internet connectivity, and providing training to employees on how to use these technologies effectively.

iv. Ensuring Regulatory Compliance: Businesses should stay informed about regulatory requirements related to e-procurement and ensure compliance. This not only avoids legal issues but also builds trust with partners and customers. Regular audits and compliance checks should be conducted to ensure ongoing adherence to regulations.

v. Providing Continuous Training: Ongoing training and support for employees on e-procurement systems are vital for ensuring these systems are adopted and used effectively. Regular training helps close any knowledge gaps employees may have when adapting to new digital platforms, equipping them with the necessary skills to operate the e-procurement system proficiently. Additionally, continuous training can mitigate resistance to change by emphasizing the benefits of the new system, thereby encouraging a more positive attitude towards its implementation.

By offering ongoing training, organizations can ensure that their employees stay informed about the latest features and updates of the e-procurement system.

This not only boosts the overall competence of the workforce but also enhances the accuracy and efficiency of procurement processes, leading to smoother operations. Moreover, continuous training sessions provide an opportunity for employees to express any concerns or challenges they face, allowing the organization to provide targeted support and make necessary adjustments to the system or training approach. A workforce that is well-trained is more likely to view the e-procurement system as a productivity-enhancing tool rather than an additional challenge. This can result in higher user satisfaction, greater adoption rates, and ultimately a better return on investment for the organization. In summary, continuous training goes beyond simply teaching employees how to use the system; it ensures they are confident, motivated, and skilled in fully utilizing the e-procurement system's capabilities.

Suggestions for Further Studies

Conducting longitudinal studies to track the adoption process of e-procurement over time would provide deeper insights into the evolving challenges and benefits experienced by small-scale businesses. This approach can help identify long-term trends and the sustained impact of e-procurement systems on business operations. Future research should explore

the adoption of e-procurement in specific industries within the small-scale business sector. This would help in understanding the unique challenges and opportunities faced by different types of businesses and allow for the development of tailored strategies to promote e-procurement adoption.

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