

INFLUENCE OF TECHNOLOGICAL, ORGANIZATIONAL, AND ENVIRONMENTAL FACTORS ON E-PROCUREMENT ADOPTION AMONG SMALL AND MEDIUM-SCALE ENTERPRISES IN BAUCHI STATE OF NIGERIA

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Abstract

This research investigates the influence of technological, organizational, and environmental factors on e-procurement adoption among Small and Medium-Scale Enterprises (SMEs) in Bauchi State, Nigeria. The study adopted a descriptive survey research design to achieve the purpose of the study which was conducted in Bauchi State, Nigeria. The population of the study comprised of 1,134 procurement officers of registered SMEs in Bauchi State. The G-Power sampling method was used to select 300 procurement officers for the study. A structured questionnaires serve as the primary data collection instrument. The data collected from the respondents was analyzed using multiple regression. The findings of the study indicated that technological, organizational, and environmental factors positively and significantly influence e-procurement adoption among SMEs in Bauchi State. The positive influence of technological, organizational, and environmental factors highlights the potential for targeted interventions and strategies to enhance e-procurement adoption among SMEs. Policymakers, business leaders, and practitioners can use these findings to contribute to the overall growth and efficiency of procurement processes in Bauchi State, fostering a conducive environment for SMEs to embrace and benefit from e-procurement technologies.

Keywords: digital accounting system, e-procurement adoption, environmental factors, organizational factors, small and medium-scale enterprises, technological factors.

Introduction

Small and Medium Enterprises (SMEs) are widely acknowledged as vital instrument for economic growth and development, particularly in developing and emerging economies. Their relevance extends beyond economic transformation and efficiency, encompassing aspects such as employment generation, innovation stimulation and enhancement of national competitiveness. In line with global sustainable development goals, SMEs play a pivotal role in alleviating poverty, fostering inclusive economic growth, and promoting the development of resilient infrastructure (Gitonga, Wasike & Sagwa, 2020). Nigeria, as a developing economy rely heavily on its SME or entrepreneurial sector for sustained economic expansion and growth. The SME landscape in Nigeria is rich with opportunities for economic diversification, resource optimization, and enhanced productivity (Asuquo, 2018). Constituting approximately 98% of all businesses in the country, SMEs are estimated to contribute around 34% to the Nigeria's Gross Domestic Product (GDP),

showcasing their significant role in economic output (National Bureau of Statistics, 2017). Moreover, SMEs in Nigeria are responsible for generating about 80% of new jobs annually, underlining their crucial role in employment generation (National Bureau of Statistics, 2017).

In the contemporary competitive business environment, the adoption of Information and Communication Technologies (ICTs) has become imperative for SMEs to enhance their competitiveness and operational efficiency (Acho & Abuh, 2018). Among various ICT applications, e-procurement or electronic procurement stands out as a promising avenue for SMEs to streamline their procurement processes, reduce costs, and improve efficiency (Gitonga, Wasike & Sagwa, 2020). E-procurement, as a major component of Internet Technology (IT) application, offers SMEs opportunities for cost reduction, efficiency improvement, and strengthened buyer-supplier relationships (Acho & Abuh, 2018). However, despite its potential benefits, the adoption of e-procurement among SMEs has been relatively slow in Bauchi State in particular and in Nigeria in general. Many SMEs in the region continue to rely on manual procurement systems, exposing themselves to inefficiencies, errors, and fraud (Aliyu, Na-Allah, Bappi & Mohammed, 2020). Recognizing the importance of e-procurement adoption in SMEs in Bauchi State and the lack of comprehensive research addressing the determinants of e-procurement adoption within this context has provided an opportunity for this present research to fill a gap. By examining the influence of technological, organizational, and environmental factors on e-procurement adoption among SMEs in Bauchi State, this study aims to provide valuable insights for key stakeholders. Understanding these three key factors is essential for devising targeted strategies to promote the widespread adoption of e-procurement among SMEs, thereby enhancing their competitiveness and contribution to the sustainable economic development of Bauchi State and beyond.

Purpose of the Study

The aim of this study was to investigate the influence of technological, organizational, and environmental factors on e-procurement adoption among SMEs in Bauchi State, Nigeria. Specifically, the study investigated:

1. the influence of technological factors on e-procurement adoption among SMEs in Bauchi State.
2. the influence of organizational factors on e-procurement adoption among SMEs in Bauchi State.
3. the influence of environmental factors on e-procurement adoption among SMEs in Bauchi State.

Literature Review

Concept of E-Procurement

Electronic procurement, also known as e-procurement, encompasses the transaction of business between sellers and buyers through the use of electronic communication or e-communication (Alvarez-Rodriguez, Labra-Gayo & de Pablos, 2014). This approach to procurement has garnered significant attention due to its potential to revolutionize traditional procurement processes. Organizational characteristics and influences have been identified as significant motivators for the adoption of e-procurement (Soong, Ahmed & Tan, 2020). Over the last decade, organizations have increasingly shifted towards digital transformation, recognizing the imperative role of Information Communication Technology (ICT) advancements in enhancing supply chain management (Opoku-Fofie, Asare-Bediako & Asamoah, 2022; Yu, Yevu & Nani, 2020). E-

procurement involves the integration of various procurement operations, including negotiation, ordering, receipt, and post-purchase review (Ohgren, Milios, Dalhmmar & Lindahl, 2019). It leverages internet technologies and services to automate and streamline organizational processes, from requisition to payment (European Commission, 2015). Despite its evolution over the years, the concept of e-procurement remains anchored in utilizing information technology and the internet to enhance procurement processes (Grimani, Gavine, & Moncur, 2020).

In the context of business performance, the adoption of e-procurement technologies hold an immense importance. By improving efficiency, facilitating sourcing processes, and enhancing competitiveness, e-procurement contributes to the overall organizational effectiveness (Belisari, Binci & Appolloni, 2020; Shukla, Khan & Shah, 2016). Additionally, e-procurement systems foster closer relationships between suppliers and businesses, leading to cost reductions and improved performance (Kunnapapdeelert & Thepmongkorn, 2017; Asif, Bano, Malick & Ansari, 2021). In public sector procurement, which constitutes a significant portion of Gross Domestic Product, strategic deployment of e-procurement is essential to meet diverse social and political objectives (Hanak, Marovic & Jajac, 2020). The adoption of e-procurement in public interest is driven by the need for accountability, transparency, integrity and efficiency in the procurement processes (Aduwo *et al.*, 2017). E-tendering and e-sourcing emerge as cost-effective strategies that streamline procurement, enhance supplier access, and ensure timely delivery of goods, thereby contributing to customer satisfaction (Wasike, 2018; Opoku-Fofie *et al.*, 2022). Overall, e-procurement represents a paradigm shift in procurement practices, harnessing communication technology to optimize buying processes and drive organizational efficiency (Wagner, 2014; Kang, Wang, Tan & Zhao, 2015; Mgidlana, 2013). Its adoption promises reduced transaction costs, improved negotiation capabilities, enhanced supplier identification and better procurement process monitoring and control, thereby positioning businesses for sustained growth and competitiveness (Mutunga, 2020).

Importance of E-Procurement

The primary objective of every firm is multifaceted, aiming not only to enhance customer satisfaction through the provision of quality goods and services but also to improve the welfare of its employees by generating higher returns and offering improved working conditions. A well-structured procurement channel within a firm invariably contributes to its overall performance. According to Grimani, Gavine and Moncur (2020), the adoption of e-procurement significantly enhances firm performance, as evidenced by several firm performance indicators. Research have shed light on the positive correlation between e-procurement adoption and firm performance. Studies have revealed that approximately 7% of variations in firm performance are attributable to e-procurement adoption (Kennedy, 2015; Quinnox, 2012). Moreover, a plethora of literature and studies by Fakhoury and Aubert (2015) and Brandon-Jones & Kauppi (2018), consistently affirmed that e-procurement adoption leads to tangible improvements in firm performance.

However, it is noteworthy that while e-procurement adoption plays a significant role, it accounted for only a fraction of the variations in firm performance, approximately 7%. For instance, Kennedy (2015) and Quinnox (2012) suggested that firm performance is influenced by a multitude of factors beyond just e-procurement adoption. Nevertheless, the benefits of e-procurement adoption extend beyond mere statistical reports. Alvarez-Rodriguez *et al.*, (2014) emphasized that e-procurement facilitates efficient management of expenditures and better management of supplier risks, thereby enabling firms to achieve better savings, innovation, agility, and flexibility. Yusuf and Lee (2015) asserted that perceived usefulness is a crucial predictor of intention to use a new system, emphasizing the important role of organizational leadership in fostering the adoption of e-procurement.

From the foregoing, one would observe that e-procurement stands out as a transformative tool that not only streamlines procurement processes but also empowers organizations to achieve higher levels of efficiency, transparency, and strategic focus. By leveraging e-procurement technologies, firms can navigate the complexities of modern procurement landscapes and emerge as agile, competitive entities poised for sustainable growth and success.

The Research Framework

The framework (see, Figure 1) shows the interplay between technological, organizational, and environmental factors on e-procurement adoption among Small and Medium Enterprises in Bauchi State, Nigeria. It is developed based on the Technology-Organization-Environment Framework (TOE) (Tornatzky & Fleisher, 1990). TOE was initially proposed by Tornatzky and Fleisher in 1990 to explain how technology, organization, and environment collectively influence a firm's adoption and implementation of technology (Tornatzky & Fleisher, 1990).

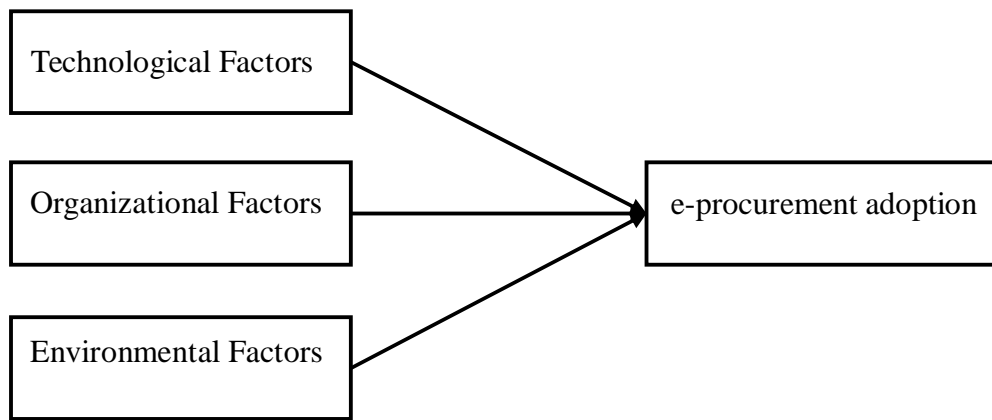


Figure 1. The Research Framework

Source: Authors Concept

According to the TOE framework, these three elements; technology, organization, and environment interact to shape a firm's approach to adopting and utilizing new technology (Tornatzky & Fleisher, 1990). They present opportunities for technological innovation and influence the firm's perception of the need for, search for, and adoption of new technology to enhance performance and contribute to economic development and employment generation. Therefore, the TOE framework provides a suitable foundation for understanding the relationship between technological, organizational, and environmental factors on e-procurement adoption among SMEs. On the bases of the literature review and conceptual framework, the following hypotheses were formed to guide the study:

Research Hypothesis 1: Technological factors significantly influence e-procurement adoption among SMEs in Bauchi State.

Research Hypothesis 2: Organizational factors significantly influence e-procurement adoption among SMEs in Bauchi State.

Research Hypothesis 3: Environmental factors significantly influence e-procurement adoption among SMEs in Bauchi State.

Method

Research Design

A descriptive survey research design was used to achieve the purpose of the study which was conducted in Bauchi State, Nigeria. This design according to Saunders, Lewis and Thornhill (2017) involves a systematic attempt to describe the characteristics of a given population or areas of interest. Similarly, Fisher (2016) stated that a survey research design method should be adopted when the study involved using a questionnaire to collect the opinions, views, and perceptions of respondents in a study. The current study was interested in using a questionnaire to collect the opinions, views, and perceptions of procurement officers of SMEs in operating Bauchi State on the adoption of e-procurement. Therefore, a survey research design was found to be more appropriate for this study.

Population and Sampling Procedure

The population of the study comprised of 1,134 procurement officers of registered SMEs in Bauchi State, Nigeria. The study randomly selected 300 procurement officers from the list of registered SMEs (sampling frame) provided by SMEDAN, using GPower a statistical software for power analysis and calculating a sample size (Faul, Erdfelder, Lang & Buchner, 2017). GPower is a statistical software commonly used in the social and behavioral sciences (Faul *et al.*, 2017).

Measurement Scales

The study adapted some related measurement scales from existing studies. The study had four (4) variables (i.e., e-procurement adoption, technological factor, organizational factor, and environmental factor). E-procurement adoption was measured with 10 items, technological factors were measured with 10 items, organizational and environmental factors were measured with 10 items respectively. The respondents were asked to indicate their responses to each question on a five-point Likert type scale as follows: Strongly Disagreed (SD)=1, Disagreed (D)=2, Undecided (UD)=3, Agreed, (A)=4, and Strongly Agreed (SA)=5.

Measurement Scales Validation

A panel of three experts validated the measuring instruments (questionnaire), which help in ensuring that they are capable of measuring what they claim to measure. Their suggestions were effected in the final copies of the measurement scales and were reproduced for testing the research hypotheses at a 0.05 level of significance.

Measurement Scales Reliability

To ensure the reliability of the measurement scales, a pilot test was conducted with 45 procurement officers of registered SMEs in Gombe State, which was outside the study area but the respondents have similar characteristics with the sample of the present study. Cronbach's alpha was used to calculate the internal consistencies of the items in the measurement scales, yielding coefficient values of 0.85 for e-procurement adoption, 0.94 for technological factor, 0.93 for organizational factor and 0.92 for environmental factor. Results obtained suggest that the instruments for data collection are considered reliable (that is, satisfactory and acceptable) because they fall within the range of 0.70 and 0.96 as recommended by Hair *et al.*, (2017).

Data analysis

The SPSS version 25.0 was used as the statistical packages for data analysis. Multiple linear regression statistic was used to test research hypotheses 1-3. It is appropriate for testing the research hypotheses because it is a statistical method for testing the influence of predictor variable on a dependent variable as depicted by Tabachnick and Fidell (2019).

Results

Table 1: Model Summary of Multiple Linear Regression Analyses on the Relationship between the Study Variables.

Variable	Standardised Coefficients Beta	T value	P value
Technological Factors	.111	2.895	.009
Organizational Factors	.249	3.819	.000
Environmental Factors	.653	13.312	.000
R Square			.592
Adjusted R Square			.588
F value			136.185
p value			.000

Hair *et al.*, (2017) recommended that when interpreting the result of multiple regression, a researcher should first consider the F value, then the R-square value or adjusted R square, and follow by the individual contribution. Following their recommendation, in this study, the statistical evidence has proved that the model was statistically significant based on the F ratio 136.185, $p = .000$. The result also revealed the R^2 value of of .59, indicating that the model fit is large. Concerning the individual contribution of independent variables, the variable technological factors had positive and significant influence on e-procurement adoption among SME's in Bauchi State ($\beta=.111$; $t=2.895$; $p=0.000$). This implies that technological factors had significant impact on e-procurement adoption among SME's in Bauchi State. Hypothesis 1 is therefore supported. Similarly, the variable organizational factors significantly influence the e-procurement adoption among SME's in Bauchi State based on t-statistics and p-values ($\beta=.249$; $t=3.819$; $p=0.000$). This indicated that organizational factors had significant influence on influence e-procurement adoption among SME's in Bauchi State. Hypothesis 2 is therefore supported. Also, environmental factors had a standardized coefficients beta value of .653, t-value of 13.312, and p-value of 0.00. The result therefore, showed that environmental factors significantly influence e-procurement adoption among SME's in Bauchi State. Hypothesis 3 is also supported.

Discussion

The findings of hypothesis 1 revealed that technological factors had significant influence on e-procurement adoption among SME's in Bauchi State. The unanimous agreement among procurement officers on the technological factors highlights the pivotal role of technology in influencing e-procurement adoption within SMEs in Bauchi State. This finding aligns with the study conducted by Laudon and Laudon (2020) who emphasized the significance of technological readiness, infrastructure, and compatibility in shaping successful e-procurement implementations. That is, the acknowledgment of these factors by procurement officers underscores the importance of investing in and optimizing technological capabilities to facilitate e-procurement adoption. The finding also corroborates Chan and Owusu (2022) who found that technological factors play a pivotal role in influencing e-procurement adoption among SMEs. This emphasizes the need for SMEs to embrace advanced technologies, asserting that it is imperative to streamline procurement processes and gaining a competitive edge.

The findings of hypothesis 2 revealed that organizational factors had a significant influence on e-procurement adoption among SME's in Bauchi State. The positive reception of organizational

factors by procurement officers aligns with contemporary research emphasizing the importance of organizational readiness, leadership support, and organizational culture in driving successful e-procurement initiatives. Similar finding was reported by Gitonga, Wasike and Sagwa (2020) in the context of Kenya emphasize the pivotal role played by organizational factors in the successful adoption of e-procurement practices. Their research highlights the importance of organizational culture, leadership commitment, and strategic alignment in facilitating the integration of electronic procurement systems.

The findings of hypothesis 3 revealed that environmental factors had significant influence on e-procurement adoption among SME's in Bauchi State, Nigeria. The strong agreement on environmental factors underscores the relevance of external influences, such as regulatory frameworks and industry norms, in shaping e-procurement adoption among SMEs in Bauchi State. Recent literature supports this finding by highlighting the impact of regulatory environments on e-procurement initiatives. For instance, Gambo and Musonda (2021) reported the transformative role of environmental factors in shaping the adoption of e-procurement. Their research underscores how external forces, including regulatory changes and market dynamics, influence the strategic decision-making processes of SMEs in adopting e-procurement technologies. Similarly, Oyekunle, and Tiamiyu (2022) established a direct correlation between the adaptability of SMEs to their external environment and the successful integration of e-procurement practices. Their study underscores the importance of aligning with the external landscape for sustainable procurement practices.

Conclusion

This research aimed at investigating the determinant factors of e-procurement adoption among Small and Medium Enterprises (SMEs) in Bauchi State, Nigeria. The results revealed that technological, organizational, and environmental factors positively and significantly influenced e-procurement adoption among SMEs in Bauchi State. The findings provide valuable insights for policymakers, business leaders, and practitioners involved in fostering e-procurement practices among SMEs. The identified determinants can serve as a foundation for developing targeted interventions and strategies to enhance the adoption of e-procurement technologies among small and medium enterprises in Bauchi State, thereby contributing to the overall growth and efficiency of the procurement processes in the State.

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