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RESEARCH ARTICLE

EFFECT OF E-PROCUREMENT ADOPTION IN PUBLIC SECTOR CONSTRUCTION PROJECTS IN AKWA IBOM STATE, NIGERIA

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ABSTRACT

This research investigated the effects of e-procurement adoption on public construction projects in Akwa Ibom State. The study utilized mixed method, that is, quantitative and qualitative techniques. A statistical software, SPSS version 2.0 was used for regression analysis to evaluate the relationships between e-procurement adoption (x1) and its effect on cost efficiency, project completion time, and quality improvement(y), based on primary data obtained through administered structured questionnaire from 100 procurement stakeholders. The hypotheses tested revealed no statistically significant relationship between e-procurement adoption and cost efficiency. The R-squared value was 0.046, indicating that 4.6% of the variation in quality improvement scores was explained by e-procurement adoption. Therefore, the hypotheses were rejected at p- value of 0.05 significance level. The study revealed that the level of e-procurement adoption in the public construction projects in Akwa Ibom State was still at its nascent stage. The study concluded that the benefits of e-procurement are contingent upon a supportive environment that includes strong institutional capacity, well-developed policies and comprehensive project management practices. These results suggested that while e-procurement holds potential for improving public procurement processes, its effectiveness is influenced by several factors beyond the technology itself, such as governance, operational efficiency, and broader systemic challenges. Also, the research findings indicates that the level of e-procurement adoption on public construction projects in Akwa Ibom State is still in its nascent stage. Based on the above findings, it is recommended that the government should put steps in place to upgrade internet connections, subsidize software cost, and facilitate access to technology as well as frequent training and retraining of procurement employees in Akwa Ibom state.

Keywords: construction industry, e-procurement adoption, operational efficiency, quality improvement, projects.

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1.0. INTRODUCTION

E-procurement, also known as electronic procurement or supplier exchange, is regarded as the process whereby organizations acquire works, goods or services primarily with the use of internet-based tools (Aduwo, 2017). It is a business-to-business process that uses a supplier's closed system and is only available to registered users. The goal of e-procurement is to obtain the best possible price and delivery time for goods and services while minimizing manual labour and procurement cycles. E-procurement has transformed the traditional procurement process into an electronic one through the utilization of information and communications technology (ICT) tools (Nandankar and Sachan, 2020). It is an aspect of e-commerce that involves the use of the internet-based ICTs to support the execution of individual or all stages of procurement activities, including e-Notification, e- Tendering, e-Submission, e-Award, e-Sourcing, e-Invoicing and e-Payment (Ibem, Afolabi, et al. 2021)

E-procurement has emerged as a crucial tool for enhancing efficiency and transparency in public sector procurement globally. Major intergovernmental bodies like the United Nation (UN), World Trade Organization (WTO) and European Union (EU) have developed guidelines and policies aimed at encouraging the implementation of e-procurement practices (Ajibike, 2019). These guidelines highlighted the ability of e-procurement solutions to reduce cycle times, improve transparency through detailed recordkeeping, enhance compliance to regulations, and curb corruption. In the Nigerian context, the 2007 Public Procurement Act was enacted to address challenges plaguing manual procurement methods in public sector. However, systemic issues like inefficient bidding processes, selective tendering and lack of advertising persisted. Hence, technology-enabled procurement has become imperative to infuse greater competition, accountability and performance. Studies highlight that implementing e-procurement in the Nigerian public sector construction projects can translate to substantial gains in project cost and completion time.

Key drivers motivating e-procurement adoption globally and in Nigeria include tremendous potential to drive efficiency, transparency, cost-savings and quality control. However, successful implementation necessitates significant investments in resources, knowledge building and governance mechanisms tailored to the public sector context (Ibem, et al., 2021). Thus, while presenting major opportunities, integrating these systems entails addressing complex barriers related to change management and evolution of supportive regulations.

In recent years, the Nigerian government has struggle with various challenges related to public procurement, a key state function. Issues like corruption, unethical conduct, insider deals and lack of transparency has led to inflated contract prices, poor project quality, and misuse of funds intended for public projects (Omorodion and Jesuorobo, 2020). Additionally, vested interests and absence of merit-based contractor selection has resulted in incompetent project execution and frequent legal disputes that delay timelines (Shatta, 2020).

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These problems arising from financial mismanagement and administrative incompetence in procurement have caused massive losses for the government annually. To address these systemic procurement hurdles, Nigeria introduced e-Procurement to streamline processes, enhance accountability and reduce costs, as evidenced by studies in developed economies (Abdullahi, Ibrahim, Ibrahim, and Bala, 2022). E-Procurement has been shown to promote transparency, prevent maverick purchasing, mitigate corruption and provide fair supplier opportunities - all contributing to superior organizational performance (Afolabi, et al, 2020). Specifically, e-tendering, e-invoicing and e-sourcing can improve process efficiency, taxpayer value and transaction cost reduction.

E-procurement process has been widely embraced by private and public sectors in the developed countries relying on information technology to enhance accountability, transparency and competition in the procurement activities. Organizations in the public sector use e-procurement for obtaining contracts to achieve benefits such as increased in efficiency among their employees and to save cost by getting faster and cheaper services and goods, (Odulana, and Oyewobi, 2019). The main advantages e-procurement can deliver include cost reduction, process re-organization, improved contract fulfillment, increased spending under management and acquiring environmental friendly goods or services through green procurement and many others (Masudin, et al. 2022). The effects of e-procurement adoption as an instrument of reform in the process to enhance public construction projects cost efficiency, completion time and quality improvement has not been well researched on public sector construction projects in Akwa Ibom State. Although, tremendous efforts have been made to implement public procurement Act that will enhance probity and transparency in the process, unfortunately, most corrupt practices in the Nigerian public construction projects are still procurement related.

The existing traditional procurement system in Nigeria is characterized by disregard for public service laws and financial regulations, over-invoicing and inflation in contracts. Other problems include lack of transparency and efficiency, human interface leading to extravagant corruption, lack of competitive tendering and preferential treatment during tender processes aid excessive paper work (Abdullahi, et al. 2019; Musa, Binti and Raslim, 2020).However, E-procurement has been widely implemented by both private and public sectors in the developed countries utilizing information technology to promote accountability and enhance transparency in the procurement process. This study therefore aims to empirically evaluate the effects of e-Procurement adoption on public construction projects. Understanding this connection is vital for the government to accurately gauge progress, pinpoint shortfalls and implement changes to optimize procurement processes and project results on public construction projects in Akwa Ibom State.

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1.1. Objectives of the Study

The objectives of the study include the following:

(i). To evaluate the effects of e-procurement adoption on cost efficiency, completion time and quality improvement on public sector construction projects in Akwa Ibom State.

(ii). To examine the level of e-procurement adoption on public sector construction projects in Akwa Ibom State.

1.1. Research Questions.

The research questions for the study include:

i. What are the effects of e-procurement adoption on public project cost efficiency, completion time and quality improvement

ii. What is the level of e- procurement adoption on public construction projects in Akwa Ibom State?

1.2. Research Hypotheses

Two research hypotheses were formulated for the study as follows:

Ho_1: There is no significant relationship between e-procurement adoption and public sector projects cost efficiency.

Ho_2: There is no significant relationship between e-procurement adoption and public sector projects completion time.

2.0. LITERATURE REVIEW

2.1.1. The Concept of Procurement

The entire process of receiving or acquiring goods and services is commonly referred to as procurement. From preparing the demand to submitting the final receipt for approval, there are a number of steps involved (Rahmani, *et al*. 2021). Purchasing, establishing product specifications, research and brand development, negotiations, and other related activities are all included in the procurement process (Moretto, Ronchi, and Patrucco, 2017). Bag, Wood, Mangla, and Luthra (2020) state that the procurement process is defined by choosing vendors, establishing payment terms, strategic vetting, selection, contract negotiations, and actual purchasing of goods with the goal of acquiring all the goods, services, and work that are essential to an organization. Laudares *et al.* (2019) define procurement as the process of locating and agreeing to terms, and acquiring goods, services, or works from an external source, frequently through a competitive bidding or tendering process.

Quantity, quality, sourcing, and timing are all managed during the procurement process to guarantee the lowest possible total cost of ownership. Within public companies, procurement process is strictly monitored to aid in promoting an unbiased and open competition as well as eliminating all forms of corruption to achieve the best possible result (Adjei-Bamfo and Maloreh-Nyamekye, 2019).

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According to alternative definitions, procurement refers to the process of obtaining the appropriate resources in the appropriate ratio, which are then delivered within the allotted time frame to the appropriate location where the materials are required and from the appropriate sources (Konys, 2019). Another crucial element of the procurement process is timeliness, since delays have the potential to disrupt the entire setup. Usually, procurement is considered as a part of a firm's input to production. It is therefore a crucial element in the corporate environment. Procurement is necessary for the success and hence it is required for buyers to procure the best quality of goods or services at the most competitive rates.

2.1.2. E-procurement

E-procurement is the modern form of procurement that utilizes advance technology, internet and networking systems (Bag, et al., 2020). The e-procurement system considers purchases that are made through online systems or over some digital network or platforms. Electronic procurement entails the deployment of ICT in every stage of the buying phase from identification of requirement through to payment and potentially to contract management (Saastamoinen, Tammi, and Reijonen, 2018). E-procurement, according to Davila, Gupta, and Palmer (2003), is the use of information and communication technology (ICT), such as the internet or web-based systems, to help the government or private organizations acquire goods and services.

Online supplier discovery, information and quote requests, purchase orders, invoice processing, and electronic payment are all examples of e-procurement procedures (SukawatandMu, 2020; Verma, 2024). It is crucial to remember that e-procurement encompasses the use of the internet, intranet, and extranet applications in the purchasing process, but it excludes outdated applications such as placing orders over the phone (Boateng, 2021). An effective application of e-procurement does not merely encourage internet buying but it links organization and their business process directly with suppliers while managing all interaction between them, (Saastamoinen, et al., 2018).

2.3.1. Effect of E-procurement on Performance

The impact of e-procurement on organizational activities and output in small and medium-sized businesses (SMEs) was examined by Sánchez-Rodríguez, et al. (2020). Using a hypothesis testing methodology, 199 managers from manufacturing SMEs were chosen as a sample. The findings indicate a strong correlation between e-procurement and SMEs. Additionally, it was discovered that e-procurement improved business performance and the procurement process. With a focus on top management support, information quality, e-procurement implementation, and company performance, Masudin, et al.(2021), examined the effects of e-procurement on the performance of Indonesian manufacturing firms. Questionnaires were used to analyze the study data. The results indicate that management support and information flow quality are the main factors influencing the adoption of e-procurement. The results showed that firms' performance is positively impacted by the success of e-procurement systems.

Waithaka and Kimani (2021) investigated the relationships between e-procurement activities and supply chain performance, emphasizing the supply chain's efficacy and efficiency that the e-procurement setup could contribute to. According to the findings, e-procurement performance improvements lead to competitive purchases and the acquisition of high-quality products, which raises an organization's competitiveness in the market. Using supply chain integration, Pattanayak and Punyatoya (2020), examined how e-procurement and supply chain technology interact to influence supply chain results. 214 respondents were selected from the construction industry as part of the survey approach used in this study. The study discovered that supply chain integration has a favorable impact on e-procurement in supply chain operations through the use of the structural equation modeling method of analysis.

2.3.2 Review on the Level of E-procurement Adoption in Public Construction projects

Afolabi et al. (2020) used six regions to investigate the factors that influence the success of e-Procurement system utilization in the Nigerian construction industry. Purposive and random sampling techniques were used as the sample approach, and the study was founded on the survey research design technique. A sample of 759 e-procurement system users participated in the study. Principal component analysis (PCA) and descriptive statistics served as the foundation for the study's findings. The objective of the research was to identify the extent of e-procurement in the various sector of the Nigerian economy. The use of e-procurement was found to be widespread among quantity surveyors. Additionally, a sizable portion of the stakeholders in the construction industry use e-procurement. Additional research showed that the most frequent users of e-Procurement systems made possible by consistent access to dependable, reasonably priced, and quick Internet services were contracting firms.

In order to help recommend best practices for public procurement systems, Afolabi et al. (2020) carried out a study to look at the gray areas that existed in these systems. The research was carried out using a survey technique, with a questionnaire serving as the instrument for gathering data. 759 stakeholders in the construction industry participated in the study, which used a two-stage sampling technique. The results highlight the key components of e-Procurement tools and technologies that facilitate announcements, information sharing about projects, proposal submission and tendering, contract award notifications, work progress tracking, and payment for completed work in the public procurement sector thereby exposing the murky areas of procurement procedures that require improvement. The indicators that are pertinent to the implementation of Ghana's e-procurement systems were studied by Tutu, et al. (2019). Sixty procurement professionals participated in the study, and the mean score ranking test was used to analyze the results. The results show that internet, power stability, procurement officers' capacity expansion, and infrastructure availability are the main determinants of e-procurement systems. Using information collected from 151 small and medium-sized businesses in the manufacturing sector of New Zealand, Hassan, et al. (2017) assessed the influence of specific factors on the use of e-procurement.

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The results showed that different factors influenced how much e-procurement was used. The most common factors influencing the use of e-procurement were external pressure from suppliers and competitors to use e-procurement, as well as perceptions of the relative advantage gained from doing so. The appropriateness of e-procurement with organizational values, practices, technology infrastructure, and strategy are additional pertinent factors that encourage its use. Ibem et al. (2021) investigated Nigerian construction workers' use of e-procurement. 759 e-procurement system users participated in the study. According to the data, which was based on descriptive statistics and factor analysis techniques, e-procurement is primarily used for sending and receiving information about tender opportunities, for tendering, and for making and receiving payments. However, the reliability and sufficiency of Internet services and contemporary technologies have improved this usage.

3.0. METHODOLOGY

Methodology of the study is presented in sections 3.1 to 3.9

3.1. Research Design

The quantitative research method was applied for this study through the collection of required data using structured survey questionnaire.

3.2. The Study Area

The study was conducted in Akwa Ibom State. Akwa Ibom State is one of the thirty-six States in the Federal Republic of Nigeria with the population of over 3.5 million people, (NPC, 2006). The state was created on 23rd September, 1987 by General Ibrahim Badamosi Babangida. There are 31 Local Government Areas including Uyo the State Capital.

3.3. Population

The total population size selected for this study were 134 people consisting of males and females construction professionals mainly architects, builders, construction/project managers, procurement/ supply chain managers, quantity surveyors and engineers in procurement departments of Akwa Ibom State.

3.4. Sampling Procedure and Technique

Purposeful sampling was used to select the samples. Purposeful sampling, according to Taherdoost (2016), is a kind of non-probability sampling in which participants are selected based on their ease of accessibility to the researcher, particularly during data collection. This study used Taro Yamane (1968) formula in determining the sample size for the study. The formula is below. Yamane formula:

$$n = \frac{N}{1 + N(e)^2}$$

n = sample size to be determined; N = population size; e = the error of sample at 5% or 0.05 significant level; The Yamane formula is stated as follows: n = the total sample size; N = the population.

$$n = \frac{134}{1+134\ (0.05)^2} \qquad (1)$$

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The sample size is 100
The Bowlers proportional allocation formula is stated below as follows:

$$nh = \frac{nNh}{N}$$

Where nh = Bowley's allocation formula
Nh = Number of items in each stratum in the population.
n = Sample size
N = Population size

Applying the formula, we have:

i). Architects $nh = \frac{100 \times (53)}{134} = 40\%$

ii). Civil Engineers $nh = \frac{100 \times (40)}{134} = 29\%$

iii). Surveyors $nh = \frac{100 \times (42)}{134} = 31\%$

3.5. Methods of Data Collection

The data for this study were collected through a survey questionnaire administered to 100 respondents working in public construction sector in Akwa Ibom state. The questionnaire consisted of closed-ended multiple-choice questions and a 5-point Likert scale. The data collection process involved both online and offline methods. The use of a closed-ended questionnaire with multiple-choice questions and a Likert scale was justified for several reasons.

3.7. Data Analyses

The study employed several statistical methods for data analyses, including descriptive statistics, graphical charts and regression

i. **Descriptive statistics** were used to summarize and describe the data collected from the survey questionnaire. This included measures such as mean and percentage. Descriptive statistics provide a clear and concise summary of the data, allowing for a better understanding of the central tendencies and variability of the variables under investigation.

ii. **Graphical charts**, such as bar charts and pie charts were used to visually represent the data and provide a visual summary of the findings. Graphical charts help in presenting the data in a more accessible and understandable format, facilitating the identification of patterns, trends, and outliers.

iii. **Regression Analysis** was used in investigating the relationship between a univariate independent variable (x1). According to Udofia (2005), regression equation can be obtained using the formula $y = a + bx + e$ (2)
Where: y = the estimated value of the dependent variable, x = the value of the independent variable, a = the y intercept, b = the regression coefficient
e = the residual or random error term

Regression coefficient of determination (R^2) from the regression analysis of variance was tested using statistical software, SPSS version 2.0.

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3.9 Decision Rule for Hypotheses Testing

The decision rule states that the null hypothesis is if the calculated value is less than the critical value. However, accept the null hypothesis if the calculated value is more significant than the critical value (tabulated value).

4.0 RESULTS AND DISCUSSIONS

This chapter gives a presentation, analysis, and discussion of results from data collected during the survey. This was done in the form of regression analysis, mean rating, percentage, and charts to enhance a clearer understanding of the discussion.

4.1. Presentation of Results

4.1.1 Gender distribution of respondent is presented in Figure 1.

Figure 1: Gender distribution

Source: Fieldwork (2024).

The data presented Figure 1 showed that the gender distribution of survey participants, with 86% of the 100 participants being men and 14% being women.

4.1.2 Age of Respondent

Age of respondent presented in Figure .2 .

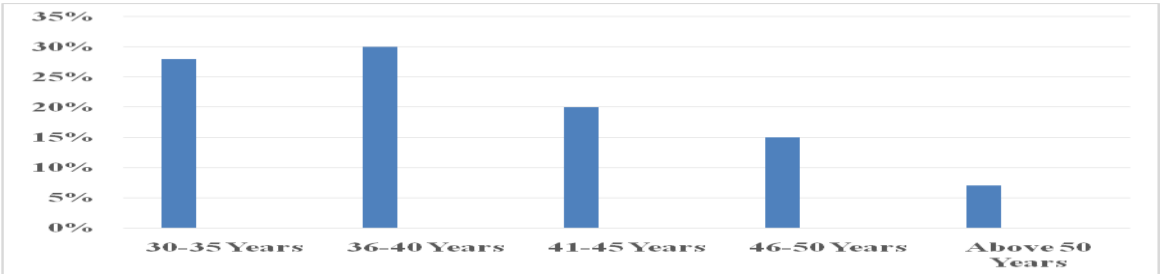

Figure 2: Age of Respondent
Source: Fieldwork (2024)

28% out of the 100 survey participants were between the ages of 30 and 35, 30% were between the ages of 36 and 40, 20% were between the ages of 41 and 45, 15% were between the ages of 46 and 50, and 7% were over 50. The respondents' modal age ranged from 36 to 40 years old.

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4.1.3 Education level of respondent

Education level of respondent presented in Figure 3.

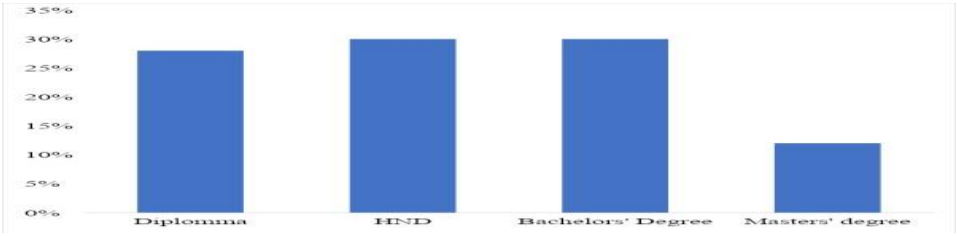

Figure 3 Education
Source: Fieldwork (2024)

The study result shown that 28% of the respondents had diploma, 30% had HND, 30% had Bachelors' degree and 12% had their Masters' degree. According to the study's findings, the majority of respondents were men between the ages of 36 and 40, and the majority of them held a bachelor's degree or an HND. Given that all of the respondents are literate, the demographic data provided demonstrated that they can use their educational background to learn and comprehend how e-procurement software is used. This supports the hypothesis put forth by Bag, et al. (2020), who concluded that only individuals with high literacy levels can effectively use e-procurement because its use is correlated with the user's educational background. According to Gallego-Alvarez (2010), e-procurement usage is influenced by demographic factors.

4.2 Testing of Research Hypothesis 1

Ho_1 was tested using a 5-point Likert scale with the following values assigned: 5 for strongly agreed (SA); 4 for agreed (A); 3 for Neutral (N); 2 for disagreed (D); and 1 for strongly disagreed (SD). This was adopted from the works of Volpato, de Almeida-Pedrin, Oltramari, Fernandes, and Conti, (2021). The four survey questions were used to test Ho1. Research hypothesis 1 which is stated below was tested using regression at 0.05 level of significance and presented in Table 1. The collected data for the study were analyzed using regression with SPSS version 23.

Ho_1: There is no significant relationship between e-procurement adoption and public sector projects cost efficiency. To evaluate null hypothesis one, data were subjected to divergence test and the outputs are summarize in Tables 1a, b, and c respectively.

Table 1a: Regression Model of Multiple Effects of the Relationship among Variables

Model	Multiple R	R Square	Adjusted R Square	Standard Error	Observation
Regression	0.034196994	0.001169434	-0.009022714	10.30457282	100

Source: Authors' Analysis (2024).

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Table 1b: ANOVA Model of Variations among the Dependent and Independent Variables

Model	df	SS	MS	F	Sig. Level
Regression	1	12.183	12.183	0.1147	0.7355
Residual	98	10406.054	106.184		
Total	99	10418.237			

Table 1c: Partial Regression Model and T-test Analysis of Relationship between Variables

	Coefficient	Std. Error	T-test	P- Value	95 % Differences	
					Lower	Upper
Intercept	78.108	2.268	34.429	1.526	73.606	82.609
X1_E-P-L	0.131	0.386	0.339	0.736	0.897	0.897

Source: Authors' Analysis (2024).

The results of regression analysis for Ho1 yielded P-value of 0.736 which is greater at 0.05. Hence, applying the decision rule the null hypothesis "Ho_1" which states that there is no significant relationship between e-procurement adoption and public sector projects cost efficiency is rejected. While the alternative hypothesis which states that there is significant relationship between e-procurement adoption and public sector projects cost efficiency is accepted. This implies that e-procurement adoption has a significant relationship with public sector projects cost efficiency.

The regression analysis revealed no statistically significant relationship between e-procurement adoption and cost efficiency. The regression cost coefficient equation is for project cost efficiency is given thus: y=78.11-0.1308x, where 'y' represents the independent variable (e-procurement adoption) and 'x' indicates rate of change in the dependent variable (cost efficiency). Analysis of cost coefficient obtained (β = -0.1308; p =0.736) showed negative relationship where the R-squared value was 0.001, indicating that only 0.1% of the variation in cost efficiency was explained by e-procurement adoption. These results suggest that e-procurement adoption alone does not have a direct or significant impact on improving cost efficiency.

The insignificant relationship between e-procurement adoption and cost efficiency could indicate the influence of external or contextual factors. Sourani and Sohail (2011) noted that in developing countries, e-procurement often encounters challenges such as low digital literacy, inadequate infrastructure, and resistance to technological change, which hinder its cost-saving potential. Furthermore, Neupane *et al*. (2012) argued that the initial investment in e-procurement systems-such as hardware, software, and training—may offset any immediate cost benefits, especially during the early stages of adoption. In public procurement, transparency and accountability are central goals of e-procurement, which can indirectly improve cost efficiency over time by reducing corruption. Similarly, Vaidya *et al*. (2006) emphasized that the effectiveness of e-procurement in achieving cost efficiency depends on complementary factors, including supplier relationships and training for users.

According to Suleiman *et al*. (2020), e-procurement minimizes the risks of fraudulent activities, such as bid rigging, by creating an auditable digital trail. However, these long-term benefits may not be immediately apparent in the short-term cost efficiency metrics used in this study.

Similarly, the results showed no significant relationship between e-procurement adoption and project completion time. Regression equation for completion time is y=24.95-0.10x. Similarly, 'y' stands for the independent variable (e-procurement adoption) while 'x' indicates rate of change in the dependent variable (project completion time). Analysis of the project completion time coefficient (β = -0.10, p =0.71) obtained in the showed negative relationship where the R-squared value was 0.001, indicating that e-procurement explains only 0.1% of the variation in completion time. This suggests that factors other than e-procurement adoption play a more critical role in influencing project timelines.

The weak relationship between e-procurement adoption and completion time aligns with literature suggesting that technology adoption does not automatically address delays caused by non-technical factors. Ibrahim *et al*. (2021) found that project delays in Nigeria's public construction sector often result from political interference, funding irregularities, and inadequate planning, none of which can be fully mitigated by e-procurement systems. Additionally, Dlamini (2012) emphasized that while e-procurement enhances the speed of administrative tasks such as bid evaluation and contract award, it cannot directly influence site-level factors, such as labor availability or material delivery delays. This suggests that e-procurement must be part of a broader strategy that addresses both administrative and operational inefficiencies. Love *et al*. (2011) argued that delays in construction projects are often caused by external factors, such as regulatory bottlenecks, unforeseen site conditions, and stakeholder disagreements, which e-procurement systems cannot directly mitigate. Additionally, Aziz (2013) highlighted that process inefficiencies in project management often outweigh the benefits of technology adoption, further supporting the findings.

In contrast, e-procurement adoption exhibited a weak but statistically significant negative relationship with quality improvement scores. Regression coefficient equation for project quality improvement is given thus: y=70.67-0.17x. Also, 'y' represents independent variable (e-procurement adoption) and 'x' indicates rate of change in the dependent variable (project quality improvement). Analysis of the project quality improvement coefficient (β = -0.17, p = 0.03) showed weak relationship between the independent variable (e-procurement adoption) where the R-squared value was 0.046, indicating that 4.6% of the variation in quality improvement scores was explained by e-procurement adoption. This finding suggests that higher levels of e-procurement adoption may have unintended negative effects on perceived project quality.

The statistically significant negative relationship between e-procurement adoption and quality improvement scores is an important finding that warrants further exploration. One possible explanation is that the use of e-procurement may inadvertently prioritize cost considerations

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over quality. Bolton (2006) highlighted that public procurement often places undue emphasis on achieving the lowest bid price, which can lead to the selection of substandard contractors or materials. Moreover, Ntayi *et al*. (2013) pointed out that the lack of supplier prequalification standards in many e-procurement systems can result in contracts being awarded to suppliers with limited capacity to deliver quality outcomes. This issue is compounded by inadequate post-contract monitoring, as noted by Agaba and Shipman (2007), which can allow suppliers to cut corners once contracts are awarded. Additionally, Gunasekaran and Ngai (2008) noted that inadequate training and improper use of e-procurement systems can compromise the quality of goods and services procured, particularly in public sector projects.

4.3Testing of Research Hypothesis 2

Ho_2 was tested using a 5-point Likert scale with the following values assigned: 5 for strongly agreed (SA); 4 for agreed (A); 3 for Neutral (N); 2 for disagreed (D); and 1 for strongly disagreed (SD). This was adopted from the works of Volpato, de Almeida-Pedrin, Oltramari, Fernandes, and Conti, (2021). The five survey questions were used to test Ho_2. Research hypothesis 1 which is stated below was tested using regression at 0.05 level of significance and presented in Table .2. The collected data for the study were analyzed using regression with SPSS version 23.

Ho_2: There is no significant relationship between e-procurement adoption and public sector projects completion time.

Table 2: Results of Analysis for Testing of Research Hypothesis 2

Table 2a: Regression Model of Multiple Effects of the Relationship among Variables

Model	Multiple R	R Square	Adjusted R Square	Standard Error	Observation
Regression	0.038221583	0.001460889	-0.008728285	7.076129751	100

Table 2b: ANOVA Model of Variations among the Dependent and Independent Variables

Model	df	SS	MS	F	Sig. Level
Regression	1	7.179098651	7.179	0.143377	0.7058
Residual	98	4907.018001	4907.018		
Total	99	4914.1971	4914.197		

Table 2c: Partial Regression Model and T-test Analysis of Relationship between Variables

	Coefficient	Std. Error	T-test	P- Value	95 % Differences	
					Lower	Upper
Intercept	24.9485	1.5579	16.0143	4.1229	21.8569	28.0401
X1_E-P-L	0.1004	0.2652	0.3787	0.7058	0.6267	0.5359

Source: Authors' Analysis (2024).

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The results of regression analysis for Ho2 yielded P-value of 0.705 which is greater m 0.05. Hence, applying the decision rule, the null hypothesis "Ho_1" which states "There is no significant relationship between e-procurement adoption and public sector projects completion time" is rejected. While the alternative hypothesis which states that "There is significant relationship between e-procurement adoption and public sector projects completion time" is accepted. This implies that e-procurement adoption has a significant relationship with public sector projects completion time. 60% of survey participants said they have not always used e-procurement, 20% said they do so frequently, 16% said they do so very frequently, and 4% said they do so occasionally. According to the modal response (60%) the majority of workers in Akwa Ibom State's public construction projects rarely employ e-procurement tools. The e-procurement process has not yet been successfully incorporated into the majority of Akwa Ibom State's public construction projects. Regular use of e-procurement would support the national agenda by lowering corruption and the different issues related to traditional procurement methods. Bertot, Jaeger, and Grimes (2010) claimed that information and communication technology (ICT) can significantly contribute to lowering the threat of corruption, which will improve better governance, in an effort to solve the mystery surrounding corrupt practices in the public procurement process.

The use of ICT will reduce the possibility of corrupt practices brought on by a lack of transparency, limited access to information, and inadequate accountability and control at every stage of the procurement process, as well as improve relations between the government and its constituents and employees in tracking events and process progress (Bertot et al., 2010). However, some contractors also found the switch from the old method to the electronic system to be difficult because they were ill-prepared. According to Rizki (2018), people-related issues mostly occur when e-procurement process staff members are not equipped with the skills needed to oversee the procedure. It makes the process more challenging.

Compatibility with organizational policies is another crucial issue that needs to be addressed when using it. Some contractors needed to make some adjustments because they did not think it could be integrated with their organizational procedures and policies. According to Davila, et al. (2003), cultural obstacles such as resistance to change, a lack of a generally accepted solution, and a lack of leadership are some of the largest obstacles to the adoption of e-procurement within the public sector

5.0 CONCLUSIONS AND RECOMMENDATIONS

Findings of this study were presented in line with the research objectives and are concluded in the discourses that follow.

The findings of this research highlight that while e-procurement can streamline administrative processes and improve transparency, its adoption has not led to significant improvements in cost efficiency, timely project completion, or quality enhancement in public construction projects in Akwa Ibom State. The negative impact on quality suggests

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that the emphasis on cost and competitive bidding may inadvertently compromise project standards.

The study revealed that the level of e-procurement adoption in the public construction projects in Akwa Ibom State was still at its nascent stage. For instance, over 80% of the employees engaged in public sector construction projects in Akwa Ibom State reported that they do not always use e-procurement system in their organizations, which clearly proved that they are still relying on the traditional paper procurement practices.

The study concluded that the benefits of e-procurement are contingent upon a supportive environment that includes strong institutional capacity, well-developed policies and comprehensive project management practices. Therefore, the mere adoption of e-procurement technology is not sufficient to achieve the desired outcomes in public sector construction projects in Akwa Ibom State.

Based on the findings of this study, the following recommendations are made:

i. It is crucial to implement robust monitoring and evaluation mechanisms to track both cost and quality throughout the project life-cycle. The adoption of e-procurement should be accompanied by rigorous supplier prequalification processes to ensure that only qualified and capable contractors are awarded projects. This will help mitigate the negative impact on quality and will ensure that the much desired benefits of e-procurement are effectively achieved in the public sector construction projects in Akwa Ibom State.

ii. There should be a concerted effort to improve the technical skills of procurement officers and project managers. Training programs focused on the effective use of e-procurement systems coupled with general project management skills, will help maximize the potential of these digital platforms and increase its level of adoption in the public sector construction projects in Akwa Ibom State.

Competing Interest

The authors have declared that no conflicting interest exist in this manuscript.

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