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Perception of Public Construction Clients on E-Procurement Implementation In Abuja

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ABSTRACT
The purpose of this study is to evaluate e-procurement implementation in Construction management in Nigeria. This was guided by certain objectives: establishing the extent of implementation of e-procurement, identifying the success factors and barriers of implementing e-procurement and identifying strategies to encourage the implementation of e-procurement in construction management in Nigeria. To achieve these research objectives, the study investigated the construction firms in Abuja, using purposive sampling. Primary data was collected using structured questionnaires. Data was analysed using descriptive statistics and percentage method.
This study revealed that there is a good knowledge of e-procurement practices in the construction industry but a very discouraging implementation extent. The study identified the prominent drivers and barriers of the implementation of e-procurement in the industry, among the drivers are; improved order tracking, timely payments, more efficient administration of procurement functions, better client services, reduction in cost of transactional activities, and transparency in the procurement procedure. And the barriers; inadequate technological infrastructure, inadequate protection of data from unauthorized access, and Lack of technical, physical and procedural controls for security. The study recommends that effective measures is necessary to be put in place by the government and private institutions like privacy laws, cybercrime laws, improvement of technical and physical infrastructure, and public private partnership to improve resources that will encourage the adoption and implementation of e-procurement.

Keywords; E-procurement, Implementation, Construction management

I. INTRODUCTION

Historically there have been major steps towards supply chain management improvement as a whole in construction management in order to enhance efficiency and reduce redundancy levels in procurement (Muthigani, 2011). The term e-commerce is linked with procurement of goods and services through the web as a result of the development of the internet and technology. Hatice and Mehmet (2012) defined e-procurement as the integration of technological tools into purchasing activities taking place within supply chains while performing their operations. For the purpose of this study, e-procurement is defined as the digitalization of procurement activities, such as search, selection, purchasing, communication, bidding or awarding of contracts. E-procurement is more than just a system for making purchases online, it's a collaborative procurement of goods, works and services using electronic methods in every stage for bringing in efficiency and transparency. The system has been implemented to achieve significant benefits such as cost savings and increased efficiency. Other advantages in applying an e-procurement system are a faster government procurement process and higher transparency compared to traditional procurement and tendering methods. The system helps organizations/ government agencies in making more informed and accurate decisions through providing easy access and relevant information about each bid and competitors. Awarding processes would be very organized and precise because the decision-making committees will have better knowledge about the bids and they could obtain better pricing which would ultimately save a lot of unnecessary costs (Nawi, Roslan, Salleh, Zulhumadi, & Harun, 2016).

The traditional procurement system enables government agencies nationwide to procure goods and services from their suppliers manually.

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E-procurement transforms the traditional procurement practice into an electronic, Internet-based practice. In the traditional procurement practice Suppliers do not have the opportunity to present their products on the World Wide Web; suppliers cannot receive, manage, and process government purchase orders, and receive payment from client/ government agencies online by using the traditional procurement system but with the automation of the entire procurement cycle within e-procurement framework, suppliers benefit significantly from the opportunity to reach a broader base of buyers than ever before, coupled with lower operating costs, shorter turnaround time, additional revenue, and increased customer satisfaction as against high overhead costs, longer turnaround time, revenue leakages and poor customer satisfaction.

II. LITERATURE REVIEW

Previous studies identified e- procurement as the process of finding, agreeing terms and acquiring construction materials, services or works from an external source, often via a tendering or competitive bidding process (Weele, 2010). (Sun, Sherry, Zhao, Jing & Wang, 2012) defined e-procurement as the digitalization of important aspects of the purchasing process, such as search, selection, communication, bidding or awarding of contracts. (Schoenherr & Tummala, 2007) defined it as the sourcing of construction materials and services via electronic means, usually through the internet. The process is used to ensure the client receives construction materials, services or works at the best possible price, when aspects such as quality, quantity, time, and location are compared. Corporations and public bodies often define processes intended to promote fair and open competition for their business while minimizing risk, such as exposure to fraud and collusion (Weele, 2010).

e- procurement life cycle in modern businesses usually consists of seven steps:

i. **Information gathering**: If the potential client does not already have an established relationship with sales/ marketing functions of contractors of needed products and services (P/S), it is necessary to search for contractors who can satisfy the requirements.

ii. **Contractor contact**: When one or more suitable contractors have been identified, requests for quotation, proposals, information or tender may be advertised. Direct contact may also be made with the potential contractors.

iii. **Background review**: References for product/service quality are consulted, and any requirements for follow-up services including installation, maintenance, and warranty are investigated. Samples of the Products/ Services (P/S) being considered may be examined, or trials undertaken.

iv. **Negotiation**: Negotiations are undertaken, and price, availability, and customization possibilities are established. Delivery schedules are negotiated, and a contract to acquire the P/S is completed.

v. **Fulfilment**: Contractor preparation, expediting, shipment, delivery, and payment for the P/S are completed, based on contract terms. Installation and training may also be included.

vi. **Consumption, maintenance, and disposal**: During this phase, the company evaluates the performance of the P/S and any accompanying service support, as they are consumed.

vii. **Renewal**: When the P/S has been consumed or disposed of, the contract expires, or the product or service is to be re-ordered, company experience with the P/S is reviewed. If the P/S is to be re-ordered, the company determines whether to consider other contractors or to continue with the same contractor.

viii. **Additional Step - Tender Notification**: Some institutions choose to use a notification service in order to raise the competition for the chosen opportunity. These systems can either be direct from their e-tendering software, or as a re-packaged notification from an external notification company (Weele, 2010)

Factors Affecting E-Procurement Implementation

In general a number of factors might hinder or influence the implementation of e-procurement in an organization including; inadequate technological infrastructure, lack of skilled personnel, inadequate technological infrastructure of partners, lack of integration with business, implementation costs, company culture, inadequate business processes to support e-procurement, regulatory and legal controls, security, co-operation of business partners capacity, inadequate e-procurement solutions, upper management support (Chipiro, 2009).

Shakir et all, (2007) further stratified several factors affecting implementation of e-procurement; economic factors,

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operational/organizational factors, environmental factors and technological factors.

Theoretical background

E-procurement studies in least developing countries had been few, and were typically generalized from other developing country contexts. For the purpose of this study the researcher used both organizational and individual theories that evaluates e-procurement practices like Adoption, implementation and influencing factors. The research was conducted in construction firms which were characterized by organization and individual characteristics. The main theory used for this research is Roger's Innovation Diffusion theory. Other supporting theories are; Frambach's adoption theory, Institution theory and the Transaction cost theory.

Roger's Innovation diffusion theory suggest that among other factors, the attributes of an innovation influence its diffusion adoption and implementation (Rogers, 2003). He identified these attributes to include: i) Relative advantage (the extent to which the innovation is viewed to be better than the existing idea, practice, knowledge or tool by users; i.e. perceived cost and benefits); ii) Compatibility (the degree to which an innovation is consistent with the existing practice, experience, norms, needs and value system of the potential adopters); iii) complexity (the degree to which an innovation is perceived as difficult to understand and use); iv) Trialability (the degree to which an innovation may be experimented with on a limited basis); and v) observability (the degree to which the results of adoption of innovation are visible to others) (Rogers, 2003).

III. METHODOLOGY

This study made use of a quantitative approach that adopted a survey in construction firms in Abuja. The study population was made up of nine construction firms in the Nigerian building industries and attention was paid to the professionals in the construction firms. Research questionnaires were distributed. The questionnaire was divided into five parts. Part A had closed and open-ended demographic questions to classify respondents. Part B had closed and open ended questions that attempted to determine the level of awareness and extent of implementation of e-procurement. Part C had questions on a five point Likert scale, these questions tried to assess how e-procurement practices adds value, reduces cost and increases transparency. Part D had questions on a five point Likert scale, these questions tried to assess the success factors and barriers of implementing e-procurement. Part E had questions on Likert scale that attempted to identify the strategies to which e- procurement practices and implementation can be encouraged in construction. Total questionnaire distributed was 53. professionals from each of the firms, duly responded to the questions in full compliance. Responses collected was made up of 45 questionnaire and respondents respectively, which makes 84% response rate due to the selective nature of the distribution. All responses were collected and interpreted.

Primary data collected from the questionnaires were summarized, coded and processed by using statistical package for social science (SPSS for windows version 20.0). The demographic information in Part A was used to categorize the respondents and to provide a general background of the respondents. The sections were analyzed through frequencies distribution tables and bar graphs.

IV. RESULTS AND DISCUSSIONS

Level of Awareness and Extent of Implementation of E-Procurement

Knowledge of E-Procurement

From the results presented in the tables below, the methods of assessing the extent of awareness or knowledge of e-procurement proved that the construction professionals have a good knowledge of e-procurement. The acceptance of technology is relatively slow in the country which explains why majority of them knew about e-procurement in construction practices within the past 5 years. There is also a need to educate construction managers on new adoptive and easy measures of e-procurement as good number of these professionals and firms either knew about e-procurement by their quest for better practices in construction management individually in the internet or by casual unofficial methods from colleagues and friends. Only a few number knew about it from the appropriate professional platforms by attending seminars and workshops.

Extent of Implementation

A noteworthy finding of this work is thatthe level of general knowledge, determines the level of acceptability in the industry, and the level of acceptability determines the extent of implementation. Which statistically explains why the extent of implementation of e-procurement in these firms is very low. Most of the firms admitted to have used e-procurement platforms to provide services before, but it is a very infrequent and dormant practice. some highlighted that e-procurement services are being used under the

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specification of clients which doesn't happen very often. Furthermore, the responses recorded also interpreted that the Manual method of procurement is still very much dominant in the industry and fully in practice regardless of the fact that a good percentages of the firms have ICT departments that are supposed to be handling e-procurement.

Table 1 Prior Knowledge On E-Procurement

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
YES	39	85.7%	85.7%	85.7%
NO	6	14.3%	14.3%	100%
Total	45	100%	100%	

Source; Survey Data 2020

Table 2: How Long Have You Known About E- Procurement?

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
0 – 5 Years	23	58.3%	58.3%	58.3%
5 – 10 Years	10	25%	25%	83.3%
10 – 20 Years	3	8.4%	8.4%	91.7%
20 – 30 Years	3	8.3%	8.3%	100%
Total	39	100	100	

Source; Survey Data 2020

Table 3: Organization Ever Use Any E-Procurement Platform to Provide Services?

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
YES	23	53%	53%	53%
NO	21	47%	47%	100%
Total	44	100%	100%	

Source; Survey Data 2020

Table 4.11 Current Procurement Platform Company Uses

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Manual	30	69%	69%	69%
Electric	0	0%	0%	69%
Both	14	31%	31%	100%
Total	44	100%	100%	

Source; Survey Data 2020

Table 4: Do You Have an ICT Department to Handle E-Procurement System?

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
YES	33	73%	73%	73%
NO	12	27%	27%	100%
Total	45	100%	100%	

Source; Survey Data 2020

Assessing the Success Factors and Barriers of Implementing E-Procurement

Success Factors

Thomson, (2008) stated the expected advantages that could be provided to organizations, direct benefits included reduction in transaction errors and transaction costs which are the main driver for adoption of e- procurement this is supported by the findings of this study which highlighted the driving factors of the implementation of e- procurement, some of the reasons that stood out prominently included; improved order tracking, timely payments, more efficient administration of procurement functions,

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better client services. Reduction in cost of transactional activities, and transparency in the procurement procedure as a part of previous objective are also driving factors for e-procurement in the industry. All the above factors have significant improvements that the electronic process facilitates, which theoretically explains why they come out strongly as the driving factors

Barriers

The technological infrastructure in construction practices in the country is very discouraging, the country's acceptance of technology and policies that supports these procedures are unavailable, also the security of information on the internet and the assurance of integrity of online transactions has been compromised over the years in this country, hence the results gotten from the analysis of the barriers, the factors that stood out are; inadequate technological infrastructure, inadequate protection of data from unauthorized access, and Lack of technical, physical and procedural controls for security.

Table 5: Improved Order Tracking

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	7	15%	15%	15%
Neither Agree nor Disagree	4	8%	8%	23%
Agree	30	69%	69%	92%
Strongly Agree	4	8%	8%	100%
Total	45	100	100	

Table 6: Timely Payments

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	4	8%	8%	8%
Disagree	4	8%	8%	16%
Neither Agree nor Disagree	14	31%	31%	47%
Agree	10	23%	23%	70%
Strongly Agree	13	30%	30%	100%
Total	45	100	100	

Table 7: More Efficient Administration of Procurement Functions

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	0	0%	0%	0%
Neither Agree nor Disagree	18	39%	39%	39%
Agree	20	46%	46%	85%
Strongly Agree	7	15%	15%	100%
Total	45	100	100	

Table 8: Better Client Services

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	0	0%	0%	0%
Neither Agree nor Disagree	20	44%	44%	44%
Agree	14	31%	31%	75%
Strongly Agree	11	25%	25%	100%
Total	45	100	100	

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Table 9: Inadequate Technological Infrastructure

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	8	18%	18%	18%
Disagree	6	13%	13%	31%
Neither Agree nor Disagree	8	18%	18%	49%
Agree	17	38%	38%	87%
Strongly Agree	6	13%	13%	100%
Total	45	100	100	

Table 10: Inadequate Protection of Data from Unauthorized Access

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	21	46%	46%	46%
Neither Agree nor Disagree	4	9%	9%	55%
Agree	14	31%	31%	86%
Strongly Agree	6	14%	14%	100%
Total	45	100	100	

Table 11: Lack of Technical, Physical and Procedural Controls for Security

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	10	23%	23%	23%
Disagree	4	8%	8%	31%
Neither Agree nor Disagree	14	31%	31%	62%
Agree	17	38%	38%	100%
Strongly Agree	0	0%	0%	
Total	45	100	100	

Identifying Strategies to which E- Procurement Practices Can Be Encouraged In Construction

The study attempted to identify strategies that can encourage the practice and improve significantly the implementation in the Nigerian construction industry and analysis from the study revealed that; procurement reforms that reduces the complexity of procurement procedures is a strategy to encourage the practice, this implies that adoption processes should be Simple and efficient. Also, improving Resources by encouraging public, private partnership in the industry. Training of employees on IT skills is a good strategy also as procurement procedures will be handled by competent hands. Other strategies that stood out are Validating the confidentiality of online transactions and improving financial and technological resources for handling and maintenance of online transactions. A better ICT Infrastructure enhances e-business development (Kim et all, 2011).

Table 12: Procurement Reforms That Reduces Complexity of Procurement Procedures

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	0	0%	0%	0%
Neither Agree nor Disagree	16	36%	36%	36%
Agree	16	36%	36%	72%
Strongly Agree	13	28%	28%	100%
Total	45	100	100	

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Table 13: Public Private Partnership to Improve Resources

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	5	10%	10%	10%
Disagree	0	0%	0%	10%
Neither Agree nor Disagree	7	15%	15%	25%
Agree	23	50%	50%	75%
Strongly Agree	10	25%	25%	100%
Total	45	100	100	

Table 14: Training of Employees On IT and Technological Skills

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	0	0%	0%	0%
Neither Agree nor Disagree	4	8%	8%	8%
Agree	24	54%	54%	62%
Strongly Agree	7	38%	38%	100%
Total	45	100	100	

Table 15: Improving Financial and Technological Resources for Maintenance and Transactions Handling

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	0	0%	0%	0%
Neither Agree nor Disagree	5	11%	11%	11%
Agree	11	24%	24%	35%
Strongly Agree	29	65%	65%	100%
Total	45	100	100	

Table 16: Validating the Integrity of Transactions

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagree	0	0%	0%	0%
Disagree	0	0%	0%	0%
Neither Agree nor Disagree	0	0%	0%	0%
Agree	22	50%	50%	50%
Strongly Agree	22	50%	50%	100%
Total	44	100	100	

V. CONCLUSION

The study serves a significant role in the evaluation of e-procurement practices in construction management in Nigeria. This study revealed that there is a good knowledge of e-procurement practices in the construction industry but a very discouraging implementation extent. The study also identified the prominent drivers and barriers of the implementation of e-procurement in the industry, among the drivers are; improved order tracking, timely payments, more efficient administration of procurement functions, better client services, reduction in cost of transactional activities, and transparency in the procurement procedure. And the barriers; inadequate technological infrastructure, inadequate protection of data from unauthorized access, and Lack of technical, physical and procedural controls for security. The study also highlightedthe strategies to encourage the implementation of e-procurement in the Nigerian Construction industry; procurement reforms that reduces the complexity of procurement procedures, improving Resources by encouraging public, private partnership, Training of employees on IT skills, Validating the confidentiality of online transactions and

improving financial and technological resources for handling and maintenance of online transactions.

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