
ASSESSMENT OF THE PROSPECTS AND CHALLENGES OF E-PROCUREMENT PRACTICES ON CONSTRUCTION PROJECT DELIVERY IN ABUJA, NIGERIA.

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ABSTRACT

Over the years, companies trading in the construction sector have sought to deliver quality projects and improve efficiency and effectiveness in their operations and services to stakeholders. The utilisation of e-procurement in other industrial sectors like manufacturing and retail has, for sometime, been widespread, but to date is considered a relatively new phenomenon in construction. However, what e-procurement strives to achieve is far from new. This paper therefore assessed the extent to which e-procurement systems is practiced in Abuja, Nigeria, it examined the prospects of e-procurement practices in Abuja, Nigeria and also examined the challenges of e-procurement practices in Abuja, Nigeria. The methodology of study involved descriptive survey research in which structured questionnaire were randomly administered to study population of construction industry professionals in Abuja, Nigeria. Data obtained in the study were analysed using both descriptive and inferential statistical methods. The findings showed that E-payment is the most practiced e-procurement system by construction professionals in Abuja, Nigeria. The results of the industry survey have also identified eleven e-procurement prospects in which elimination of direct human interaction on bidding, internal efficiency increase, productivity improvement, improved effectiveness of purchasing process and reduced paperwork were top ranked. Additionally, e-procurement systems having technical problems, clients' lack of experience, lack of experts for system vendors and customers' lack of trust for the e-procurement systems were the top ranked challenges out of the twelve identified. It is believed that the findings of this study will encourage a wider adoption of the various e-procurement systems in Abuja and across Nigeria as well towards achieving successful construction project implementation.

Keywords: *E-procurement, E-procurement Technologies and Systems, E-sourcing, E-invoicing, E-purchasing, E-payment*

Introduction

Invention and adoption of new technologies and ideas increase the productivity of the business organizations, which will in turn translate to high economic growth. Recent technology advancements in Information and Communication Technologies (ICT) have made a paradigm shift in the way business processes are conducted for effective delivery of projects. Electronic procurement (E-procurement) is one of the technological solutions to facilitate corporate buying.

(Shukla, Khan and Shah, 2016). The amount of business conducted electronically has reached hundreds of billions of dollars, and there is little doubt that the emergence of the internet is continually revolutionising access to communication and information (Kajewski & Weippert, 2004). The construction industry has been one of the most impacted by these radical changes. Construction industry professionals now aim at paralleling the level of use of ICTs by other industries in the performance of their activities (Ibidapo, 2000)

According to Tindsley and Stephenson (2008), e-Procurement systems can address the challenges experienced in the traditional processes of procuring goods and services in the construction sector. E-Procurement systems build on the activities in the traditional procurement strategies to deliver a seamless process for the construction firm and prospective bidders (Black, Du and Nieto, 2005). Oyediran and Akintola (2011) affirmed that e-Procurement platforms increase productivity in the construction cycle while empowering construction stakeholders to closely monitor the procurement process. In addition, their study identified the benefits of cost-saving as a result of fewer paper-based transactions and increased efficiency.

The presence of ICTs in the construction industry has helped professionals to create a competitive niche in their activities compared to their traditional counterpart. Notably, the introduction of the Internet has been harnessed to solve productivity issues and bridge the supply chain of many contractors in the construction sector. In spite of this, studies from early 2000 showed that E-procurement has had low usage due to unawareness and low e-maturity of construction stakeholders (Kajewski & Weippert, 2004).

In spite of the fact that previous researchers generally conclude that e-procurement system is effective, the question is why procurement process is still based on manual activities i.e. traditional procurement system. Despite the benefits of e-procurement and the contribution to the procurement phase of a project, there are factors and challenges that affect the wide use of e-procurement. However, majority of the construction and consultancy firms are still skeptical of the potential benefits mainly due to limited human resources as regards the operation of the e-procurement process. Research has shown that no extensive study has been conducted on this ineffectiveness and wide use of e-procurement in the Nigerian construction industry. In view of this gap, this study however assesses electronic procurement practices on construction projects in Abuja, Nigeria and therefore seeks to achieve the following objectives:

- i. To assess the extent to which e-procurement systems is practiced in Abuja, Nigeria.
- ii. To examine the prospects of e-procurement practices in Abuja, Nigeria.
- iii. To examine the challenges of e-procurement practices in Abuja, Nigeria.

This research was carried out to answer the following research questions:

- i. To what extent are e-procurement systems practiced in Abuja, Nigeria?
- ii. What are the prospects of e-procurement practices in Abuja, Nigeria?
- iii. What are the challenges of e-procurement practices in Abuja, Nigeria?

Literature Review

E-procurement as a Strategy for Construction Project Delivery

E-Procurement refers to the use of internet-based system to carry out individual or all stages of procurement process, including search, sourcing, negotiation, ordering, receipt, and post-purchase review (Croom and Brandon, 2004). Koorn et al (2001) describes three types of e-Procurement systems which are buyer e-Procurement systems; seller e-Procurement systems; and online intermediaries.

Most organisations are primarily using e-procurement technologies to acquire noncore supplies, including office products, computer and related equipment, and maintenance, repair and operating expenses (MRO). However, Davila, Gupta and Palmer (2002) indicate a likely trend towards integrating e-procurement technologies into core business processes as more companies use them to purchase inventory, services and capital goods. Tonkin (2003) considers that e-procurement is simply those aspects of the procurement function supported by various forms of electronic communication. Its use in both the public and private sectors takes many forms including: electronic data interchange (EDI), e-MRO (maintenance, repair and operation), enterprise resource planning, web-based enterprise resource planning, e-sourcing, e-tendering, e-reverse auctioning, e-auction for disposals, e-informing and e-collaboration. However, Oughton (2005) suggests e-procurement tools broadly relate to two aspects of procurement: sourcing activity, and transactional purchasing. E-procurement can therefore be considered as a collective term for a range of technologies that can be used to automate the internal and external processes associated with sourcing and buying (IDeA, 2004).

E-procurement has recently drawn great attention and has been adopted by an increasing number of private and public organisations. Vaiday, et al. (2002) emphasized the transparency benefits of e-procurement which can provide subsequent benefits to construction organizations. The tangible benefits of e-procurement consist of the benefits that are required to deliver enhanced shareholder value and thus gain approval, such as price savings and process cost reduction (Eakin, 2003; BuyIT, 2002). Thus tangible benefits could be identified as reduction in purchase price and improved process efficiencies, in addition to reduction in overhead costs and process costs (BuyIT, 2002; DPWS, 2002; IDeA, 2004; Turban et al, 2004; Chaffey, 2004). Coupled with these benefits includes intangibles such as improved information, communication, collaboration and knowledge management, in addition to improved commercial relationships with suppliers and high visibility of suppliers' performance (BuyIT, 2002; DPWS, 2002; IDeA, 2004; Chatterjee, 2005).

However, there are many identified barriers that make construction organisations fear the adoption of e-procurement solutions, and different construction organisations may consider different issues as the reasons not to embrace the technology. In essence, barriers can be identified as technical barriers, market barriers and organisational barriers.

Aduwo et al,(2016) identified the barriers that reduce the use of e-Procurement systems in the Nigerian environment as majorly cost of providing the physical infrastructure and skill torun it. The study further identified the predictors of low uptake of e-Procurement by construction stakeholders.

In the study by Ibem et al. (2018), the digital technologies that aid the use of e-Procurement systems in the Nigerian construction industry were identified. The digital technologies mostly used were emails by construction stakeholders rather than a custom or third-party web-based/cloud procurement system. Their study argued that there are critical factors that spur the choice of digital technologies implemented in the e-Procurement process. The authors noted that construction stakeholders adopted e-Procurement technologies due to its ability to eliminate location barrier of procurement participants, increased efficiency, improved procurement data management, and improved transfer of information during the procurement process.

In Kenya, Obat (2016) identified key areas of internet, supplier, and change as strategic points for e-Procurement integration in the construction sector. He argued that the Internet services must be reliable and suppliers must be integrated in thee-Procurement process. In addition, a proper change management plan should be drawn up while moving from the traditional to ICT-based tools. The study by Afolabi et al., (2019) revealed that construction stakeholders perceived the availability of reliable, affordable and fast Internet services as the most critical success factors for the adoption of e-Procurement technologies. The critical success factors (CSFs) were further classified into management support for physical infrastructure, and human factors and characteristics of the technology. The study showed that these critical success factors (CSFs) are crucial for the adoption of e-Procurement systems in the Nigerian construction industry. From the aforementioned studies, there are few studies that have concentrated on developing countries in sub-Saharan Africa such as Nigeria. More of them have been focused on organizational factors. Therefore, there is an existing literature gap on the prospects and challenges of e-procurement practices on construction project delivery.

Research Methodology

This study used a descriptive research design to assess the prospects and challenges of E-Procurement practices on construction Project delivery in Abuja, Nigeria. The design seeks to describe the extent of e-procurement systems(e-sourcing, e-invoicing, e-purchasing and e-payment) adopted in the industry and examine the prospects and challenges of e-procurement practices on the delivery of construction projects. For the purpose of this research study, questionnaires were drawn with the prime objectives of assessing e-procurement practices adoption, prospects and challenges on construction project delivery using Abuja as a case study. Mugenda and Mugenda, (2003) describes the target population as complete set of individual cases or objects with some common characteristic to which the research wants to generalize the result of the study. Population also refers to the larger group from which a sample is taken (Orodho, 2003). The targeted population for this study involved all the construction professionals; architects, builders, construction/project managers, procurement/supply chain

managers, quantity surveyors and engineers in Abuja, Nigeria. For the purpose of this study, the simple random sampling method was employed in selecting respondents who contributed to the data collected for the research.

Results and Discussions

Background Data of Respondents

Result in Table 1 shows the background data of respondents. It shows that there were more male respondents (75.0%) than female respondents (25.0%) in this survey, this is because there are more male construction workers than the female construction workers in Abuja due to the nature of the work being carried out there. The table shows that majority of the respondents fell between the age group of 25-29 representing 36 (42.9%). 21 (25.0%) were within the age bracket of 30-34. 15 (17.9%) were within the age bracket of 35-39 and 12 (14.3%) respondents fell between the ages of 40 and above. In terms of academic qualification, majority of the respondents are HND/B.Sc. holders 48 with a percentage of (57.1%), while 12 (14.3%) are M.Sc/MEng/MTech holders, 2 (2.4%) are PhD holders and 22 (26.2%) are OND/NCE holders. This goes to show that majority of respondents were at least university graduates. The most represented professionals are the Architects and Quantity Surveyors with 25.0% and 22.6% respectively. The least are Procurement/Supply chain managers and Construction/Project Managers with 8.3% and 9.5% respectively. According to the table, most of the respondents are in the lower level of management which represents 51 (60.7%) of the respondents' population. However, 25 (29.8%) were at the middle level of management and 8 (9.5%) were at the top level of management. Most of the respondents were within the work experience bracket of 1-5 years which represents 31 (36.9%) of the respondents' population. However, 26 (31.0%) were within the work bracket of 6-10years, 14 (16.7%) were within the work bracket of 11-15years and 13 (15.5%) were within the work bracket of 15years and above. This implies that the respondents were well equipped both academically and professionally to give reasonable insight to the questions of this research.

Table 1: Background Data of Respondents

	Categories	Frequency	Percentage(%)
Gender	Male	63	75.0
	Female	21	25.0
	Total	84	100.0
Age	25 -29	36	42.9
	30 – 34	21	25.0
	35 – 39	15	17.9
	40 – above	12	14.3
	Total	84	100
Education	OND/NCE	22	26.2

	HND/B.Sc.	48	57.1
	M.Sc./MEng/M.Tech	12	14.3
	PhD	2	2.4
	Total	84	100
Profession	Architect	19	22.6
	Quantity Surveyor	21	25.0
	Procurement/Supply chain Manager	7	8.3
	Builder	12	14.3
	Engineer	17	20.2
	Construction/Project Manager	8	9.5
	Total	84	100
Management Level	Lower	51	60.7
	Middle	25	29.8
	Top	8	9.5
	Total	84	100
Experience	1 – 5	31	36.9
	6 – 10	26	31.0
	11 – 15	14	16.7
	Above 15 years	13	5.5
	Total	84	100

Extent of E-procurement Systems Practiced on Construction Projects

In analysing the extent at which e-procurement systems are frequently used on construction projects within the state, a list of e-procurement systems was provided which the respondents were asked to indicate the extent to which the systems have been integrated into the procurement function of their projects using a scale of 1-5, where (1-Not at all, 2-small extent, 3-moderate extent, 4-large extent and 5- very large extent) as shown below in Table 2. From the Table, result reveals that for the adoption of e-sourcing, majority of the respondents practice e-tendering and e-auctioning to a moderate extent respectively. For the adoption of e-invoicing, majority of the Respondent practice e-invoicing to a moderate extent. For e-purchasing, majority do not practice e-purchasing, e-marketplace and supplier website. For e-payment, majority of the respondents practice Internet mobile payment, Credit and debit cards to a very large extent. Overall, it can be seen that e-procurement systems have considerable amount of usage in the delivery of construction projects in Abuja, Nigeria. However, the system mostly used to a very large extent is the e-payment and the least is the e-purchasing.

Table 2: Extent of E-procurement systems practiced on construction projects.

	E-Sourcing	1	2	3	4	5
1	E-Tendering	9	6	29	19	21
2	E-Auctioning	1	11	34	21	17
	E-Invoicing					
3	E-Invoicing	5	10	37	20	12
	E-Purchasing					
4	E-Purchasing	45	4	11	15	9
5	E-Marketplace	46	5	20	10	3
6	Supplier Websites	33	9	12	23	7
	E-Payment					
7	Internet Mobile Payments	3	11	15	20	35
8	Credit and Debit cards	6	14	21	14	29

Prospects of E-Procurement Systems

Table 3 focuses on the prospects or qualitative benefits that accrue from adopting E-procurement in Abuja, Nigeria. These benefits are expected to accelerate the rate of adoption of e-procurement once the uncertainties that remain are reduced to levels that encourage significant resource commitments. In determining these, a list of factors identified from literatures was provided which the respondents were to rate based on their level of significance. The table shows the ranking of the factors and their mean values. From the table it can be seen that E-procurement eliminates the direct human interaction on bidding, and internal efficiency increase, Productivity and/or service improvement, Improved effectiveness of purchasing process and Reduced paperwork are the top ranked factors with an overall mean weighted point of 3.99, 3.98, 3.98 and 3.95 respectively. The least ranked is Reduced order cycle times with a mean point of 3.57. This generally implies that the elimination of direct human interaction on bidding, internal efficiency

increase, productivity improvement, improved effectiveness of purchasing process and reduced paperwork are the major prospects of e-procurement in Abuja, Nigeria.

Table 3: Prospects of E-procurement Systems

	Prospects of E-procurement systems	1	2	3	4	5	Mean Weighted Point	Rank
1	Reduce order cycle times	7	10	13	36	18	3.57	11
2	Expand supplier bases	8	9	17	19	31	3.67	9
3	Reduce paperwork	3	10	15	16	40	3.95	4
4	Eliminate order errors	6	8	10	22	38	3.93	5
5	Inventory reduction	2	16	18	27	21	3.58	10
6	Productivity and/or service improvement	4	9	11	21	39	3.98	2
7	Decrease prices, price advantages	6	9	13	21	35	3.83	6
8	Improved communication and collaboration with suppliers	2	15	19	20	28	3.68	8
9	Improved planning and control	10	4	14	19	37	3.82	7
10	Improved effectiveness of purchasing process	5	7	12	21	39	3.98	2
11	E-procurement eliminates the direct human interaction on bidding, and	3	10	12	20	40	3.99	1

	internal efficiency increase.							
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Challenges of E-procurement systems

Table 4 shows the challenges that respondents face with e-procurement implementation on their projects. The table shows the ranking of the factors identified from literatures and their mean values. From the table it can be seen that E-procurement systems having technical problems, Clients' lack of experience, Lack of experts for system vendors and Customers' lack of trust for the e-procurement systems are the top ranked factors with an overall mean weighted point of 3.99, 3.85, 3.82 and 3.82 respectively. The least ranked is No support from government with a mean point of 3.56. This generally implies that the major challenges construction professionals face with e-procurement systems on construction project delivery are technical problems experienced with the systems, clients' lack of experience, lack of expert system vendors and lack of trust for the e-procurement systems.

Table 4: Challenges of e-procurement systems

	Challenges of E-procurement systems	1	2	3	4	5	Mean Weighted Point	Rank
1	No support from Government	10	11	16	23	24	3.48	11
2	Infrastructure problems for implementing E-procurement	8	6	12	26	32	3.81	5
3	Clients' lack of experience	6	9	13	20	36	3.85	2
4	No clear strategy for e-procurement business	7	10	14	33	20	3.58	9
5	Lack of experts for system vendors	10	4	14	19	37	3.82	3

6	Expensive good quality e-procurement	7	11	13	22	31	3.70	7
7	Corruption from customers	10	11	17	21	25	3.48	11
8	Customers' lack of trust for the e-procurement systems	7	8	11	25	33	3.82	3
9	Material suppliers not qualified for e-procurement	9	7	10	27	31	3.76	6
10	Contracting not transparent in e-procurement system	7	9	26	12	30	3.58	9
11	No quality control for the e-procurement systems	8	9	14	22	31	3.70	7
12	E-procurement systems having technical problems	4	8	12	21	39	3.99	1

Conclusion

This research study was carried out to assess the prospects and challenges of e-procurement practices on construction project delivery in Abuja, Nigeria. The findings from the research have indicated that e-procurement systems and applications are still in their infancy and construction professionals are currently experiencing development issues, which can be expected with the implementation of new technologies and change initiatives.

The study found out that E-payment is the most practiced e-procurement system by construction professionals in Abuja, Nigeria. The results of the industry survey have also identified eleven (11) e-procurement prospects in which elimination of direct human interaction on bidding, internal efficiency increase, productivity improvement, improved effectiveness of purchasing

process and reduced paperwork were top ranked. Additionally, E-procurement systems having technical problems, clients' lack of experience, lack of experts for system vendors and customers' lack of trust for the e-procurement systems were the top ranked challenges out of the twelve (12) identified. It is believed that the findings of this study will encourage a wider adoption of the various e-procurement systems in Abuja and across Nigeria as well towards achieving successful construction project implementation.

Recommendations

In view of the research findings and conclusions drawn from the study, the following recommendations are made.

- Organizations and Nigerian government should pay more attentions to spread the knowledge about electronic procurement systems, related processes and procedures to reach new level of success toward the e-business.
- It is the responsibility of organizations for both public and private sectors to develop more efficient systems and fully integrated solutions for e-procurement.
- The ICT developers' companies are required to do more customizations for the electronic procurement integrations, especially for construction industry by integrating the systems to the related industrial systems such as BIM, and other financial systems.

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