### IMPLEMENTATION OF E-PROCUREMENT IN PUBLIC BUILDING CONSTRUCTION PROJECTS OF THE FEDERAL CAPITAL TERRITORY ADMINISTRATION, ABUJA

#### ABSTRACT

Governments around the world have set very ambitious goals and are running programmes for the implementation of electronic service delivery in the public sector. Public sector project suffers a lot setback in procurements innovation and the implementation of e-procurement technology. This study, thus, examined the implementation of e-procurement in public building construction projects. The study adopted quantitative approach. A total of 145 questionnaires were administered using stratified sampling method. A total of 143 questionnaires was returned and found valid for analysis. The collected data were analysed using Percentages, frequency, Mean Item Score (MIS), Relative Importance Index (RII) and Skruskal Wallis test. The study found that lack of technical expertise, unreliable power supply, inadequate government support, poor ICT and internet facilities, and high costs of implementation are the main barriers to e-procurement uptake in FCTA. Good governance in reduction of collusion among the bidders, and transparency and openness in public procurement, are the leading prospects to eprocurement implementation in the FCTA. Inadequate financial resources and backing, and inadequate technological infrastructure of tenderers are the challenges of implementing eprocurement by the public. It was found that the prominent strategies for effective implementation of e-procurement in public sectors are; Assessing and documenting the current procurement process, Review and select the optimal e-procurement solution provider for your needs. It is recommended that appropriate legislations should be put in place by the government to encourage the uptake and adoption of e-procurement in the Federal Capital Territory Administration secretariat.

#### CHAPTER ONE

## 1.0 INTRODUCTION

### 1.1 Background to the Study

The building construction sector is faced with complex challenges, which call for the most efficient use of available resources. Consequently, the organisations involved in the procurement of building services, products and materials are constantly seeking ways of improving efficiency and effectiveness in their procurement activities. Among the different strategies considered to offer fresh opportunities for organisations in the building sector to improve communication and integration of task from different project team members and encourage teamwork in their procurement endeavours is the adoption of information and communication technology (ICT), such as the Internet procurement system (Ajibike, 2019).

According to Fayomi (2013), Nigeria can be described as a country of irony as the socioeconomic performance over the years remained superficial and unimpressive. This was largely attributed to high level of corruption or mismanagement of public resources closely linked up with the public sector procurement systems (Fayomi, 2013).

The recent economic downturn in Nigeria has necessitated the adoption of more prudent methods of delivering construction projects. Thus, procuring entities of the government are faced with the challenge of effectively procuring projects within the meagre budget of the government (Osanyinro and Aghimien, 2017). The traditional procurement system widely practiced in the Nigerian public sector, which involves the normal advertisement process, bidding, selection to the award process is heavily challenged with so many setbacks, including selective tendering process, sole source contracting, advertisement challenges, limited and ineffective public bidding, among others. These setbacks necessitated procurement reforms in

Nigeria through the implementation of the e-procurement systems (Afolayan, 2015; Ajibike, 2019).

Over past few decades, e-procurement had been widely believed to be an avenue for integrating communities and countries into a global market economy. Thus, governments around the world set very ambitious goals and also running programmes with considerable financial volume for the implementation of electronic service delivery in the public sector (George, 2010; Toth and kwarwa, 2018).

The Federal Capital Territory Administration (FCTA) Abuja, Nigeria suffers many public procurement setbacks for non-implementation of e-procurement system, to which the issue of transparency and accountability, political control and auditing, and many more are challenges affecting the traditional procurement processes (Ajibike, 2019). Therefore, implementation of the e-procurement system in the public sectors of Nigeria can play an important role in minimising corrupt practices by promoting good governance and enhancing relationships between government employees and citizens tracking through monitoring and controlling and thereby reducing the potentiality of corrupt behaviours (Organisation for Economic Cooperation Development) (OECD, 2009).

The E-procurement system is web technology-based purchasing solutions aimed at simplifying commercial transactions within and between organisations and information technology solutions for ordering, logistics and handling systems as well as for payment systems (Gunasekaran *et al.*, 2009). Various business concerns had found it appropriate to embrace the use of internet facilities to enhance the performance of tasks (Akintola and Oyediran, 2011; Mauti-Mose and Magutu, 2013).

The lack of detailed research findings on of e-procurement implementation in FCTA has result the government to be late to adopt the system in order to enjoy the benefits of this new technology to the public sector (Ajibike, 2019). It is against this backdrop that the study seeks to explore the prospects of e-procurement implementation in the FCTA, Abuja, Nigeria.

#### **1.2 Statement of the Research Problem**

The procurement system suffers various forms of malpractice and unethical conduct, including a high incidence of vested interest, interference and insider dealings and occasional cases of retrospective approval of contract awards. There is significant lack of professional knowledge and expertise in the purchasing and contracting function at all levels (Agaba and Shipman, 2012; Gastor, 2019).

The FCTA is among the government agencies that is yet to adapt into the e-Procurement system. The traditional procurement system adopted by FCTA is challenged with problems of transparency, accountability, fraud, corruption, among others, and this has drastically affected the efficiency and effectiveness of the procurement process (Ajibike, 2019). This calls for a digitalised form of procurement system. lack of detailed research on e-procurement system and little understanding on its implementation in the public sector in Nigeria has made the government to be late to adopt the e-procurement system, thus, the implementation of this new technology has become another challenge for Nigerian public sector (Aliyu, 2015; Olatunji *et al.*, 2016; Ajibike, 2019).

As a result of little understanding of e-procurement implementation process, the traditional procurement system adopted by the FCTA, Abuja for building construction works is characterised by fraudulent practices.

### 1.3 Aim and Objectives of the Study

The aim of this study is to explore the prospects of implementation of e-procurement in building construction projects of the FCTA, Abuja with a view to mitigating procurement fraud in Nigeria.

To achieve the aim of the research, the following specific objectives are formulated to:

- i. Examine the challenges associated with the paper-based procurement system in building construction projects of the FCTA Abuja;
- Examine the barriers to the uptake of E-procurement in building construction projects of the FCTA Abuja;
- iii. Explore the prospects of e-procurement implementation in building construction projects of the FCTA Abuja.
- iv. Examine the challenges of implementing E-procurement in the building construction projects of the FCTA Abuja.
- v. Develop strategies for effective implementation of e-procurement in the public sector of the FCTA Abuja.

### **1.4 Research Questions**

The key research questions to answer the objectives are:

- i. What are the challenges associated with the paper-based procurement system in building construction projects of the FCTA Abuja;
- ii. What are the barriers to the uptake of E-procurement in FCTA Abuja building projects?
- iii. What are the prospects of e-procurement implementation in the FCTA Abuja?
- iv. What are the challenges of implementing E-procurement by Public FCTA Abuja?
- v. What are the strategies for effective implementation of e-procurement in the public sector of the FCTA Abuja?

#### **1.5 Justification for the Study**

To effectively justify this study, the contributions of previous studies on e-procurement cannot be overemphasised. Internationally, studies have explored the use of e-Procurement in construction in several countries, including the USA (Issa *et al.*, 2003), Canada (Rankin *et al.*, 2006), Australia (Zuo and Seo, 2006), the UK (Eadie *et al.*, 2007; 2010; 2011), South Africa (Ibem and Laryea, 2015), and Nigeria (Oyediran and Akintola, 2011). Others have examined the strategic, opportunistic and operational benefits of e-procurement (Eadie *et al.*, 2007; 2010; Farzin and Nezhad, 2010), and the factors influencing its adoption in supply chain management (Teo *et al.*, 2009; Daud *et al.*, 2013). Hashim *et al.* (2014) noted that e-Procurement in construction was not widespread, and that there has been limited research into the factors affecting its adoption in the construction industry. Ibem and Laryea (2015) have observed that this is particularly evident in African countries where e-Procurement adoption in construction related areas appears to be at its emerging stage.

Previous studies on e-procurement in Nigeria concentrated specifically on the state e-tendering in Nigeria; barriers to the uptake of e-tendering in Nigeria (Oyediran and Akintola, 2011; Bello and Iyagba, 2013). Therefore, few studies concentrated on the implementation of e-procurement, particularly in the Federal Capital Administration, Abuja. This serves as the gap this research is intending to fill.

The research outcome would be of significant value to the Federal Capital Territory Administration to enhance the implementation of e-procurement in the FCTA. It will also be significant to other public sectors on the likely ways of implementing the e-procurement system in Nigeria.

1.6 Scope and Delimitations of the Study

The research covered the implementation of e-procurement in public building construction of the FCTA, Abuja. The geographical scope of the study covered the procurement units of the following 12 organisation within the Federal Capital Territory Administration Secretariats: the FCT Procurement, FCT Secondary Education Board, FCT Universal Basic Education Board, FCT Education Secretariat, FCT Transport Secretariat, FCT Agricultural Secretariat, FCT Area Council Service Commission, FCT Water board, FCT Inland Revenue Services, FCT Environmental Protection Agency, FCT Health secretariat, Abuja Metropolitan Management Council (AMMCI). They were selected because they form part of the Federal Capital Territory Administration.

The contextual scope of this study encompasses procurement process of building construction projects within the FCTA Abuja. The respondents were the procurement officers and other building professionals within the procurement units, including, Quantity Surveyors, Architects, Builders, and Services Engineers.

#### **CHAPTER TWO**

2.0

### LITERATURE REVIEW

#### **2.1 Procurement in the Construction Industry**

Procurement as defined by Mulch (2009) is a formal process by which many organisations obtain goods and services. Public procurement is the process by which governments buy inputs for vital public-sector investments. Those investments, both in physical infrastructure and in strengthened institutional and human capacities, lay foundations for national development. In procurement terms, those inputs are civil works, goods and services (Bureau for Public Procurement) (BPP, 2011).

Procurement encompasses the whole process of acquiring property and/or services. It begins when an agency has identified a need and decided on its procurement requirement. Procurement continues through the processes of risk assessment, seeking and evaluating alternative solutions, contract award, delivery of and payment for the property and/or services and, where relevant, the on-going management of a contract and consideration of options related to the contract. Procurement also extends to the ultimate disposal of property at the end of its useful life (Hui et al., 2011).

Construction projects are time-consuming undertakings, which are considered successful if delivered on time, to an appropriate budget and to a quality desired by the owner (Waziri, 2012). However, in recent times, apart from the above-mentioned indicators of project success, health and safety, and environmental performance have also become important aspects of project performance. Many literature and studies on the construction industry have analysed projects and tried to identify factors affecting project performance. Though the factors found are numerous, a lot of the studies indicated that procurement related factors have significant effects on construction project performance (Ogunsami, 2013).

Nigeria has shown a significant regression in procurement processes in compares to the heavy investment channelled into the sector, different studies have confirmed the use of various types of procurement methods for project delivery in Nigeria (Ogunsami, 2013). The traditional procurement route, which has been widely criticised, as an ineffective procurement route is the most often used (Ojo et al., 2006).

Hunja (2010) further stated that over-duplication of procurement manuals leads to diverse interpretations and implementation of existing rules across various public agencies and even within some of the agencies, lack of oversight responsibilities for the proper functioning of the procurement system creates serious gap in the enforcement of rules.

In another study, Fayomi (2013) noted that countries all over the world are always besets with various political and socio-economic problems at one time or the other. Constant efforts are often being made by the various governments to find solutions to such problems. This is usually through administrative reforms, whereby a policy option is made to halt a named political, educational or socio-economic problem. Fayomi (2013) further stressed that the due process policy is a package of policy measures, and like any other policy, it has set goals, which it aimed at achieving. Thus, the institution of the reform measures presupposes the existence of some administrative deficiencies. The rectification of the flows in the administrative machinery depends on the satisfactory implementation of the reform goals (Aliyu, 2015).

It becomes apt to discuss the rationale for the introduction of the due process policy in the public procurement in Nigeria. That is what are the major differences or defects of the previous procurement system that the due process policy is addressing. According to the highlight of the budgets monitoring and price intelligence unit (BMPTU) which is the office in-charge of the due process, though now changed to the Bureau of Public Procurement (BPP). According to the BMPIU manual (2005), some of the defects of public procurement in Nigeria are: lack of competition and transparency in project procurement leading to high cost of project, improper

project packaging and definition compounding ineffectiveness, budget proposal submitted by the MDAs not being related to justifiable needs, preference for new projects, thereby encouraging regular midstream abandonment of projects in progress and this also fuels the cultural disdain for maintenance, rehabilitation and refurbishment of existing facilities and infrastructure, Projects not prioritized, recorded and synchronized among the MDAs such that many Ministries, Departments and Agencies (MDAs) are pursuing the same or similar need simultaneously with resultant lack of economy efficiency and effectiveness, while creating overlapping and waste.

#### **2.2 E-Procurement Implementation in Construction Projects**

Electronic procurement (e-procurement), which implies the automation of an organisation's procurement of goods and services through web based applications, has been noted for its potentials to rationalise organisational expenditure, reduce administrative costs, and stimulate efficiency in operations (Gardenal, 2013).Typically, procurement is one of the most important areas in organisational cost structure, and public sector organisations applying e-procurement for contracts could generate several benefits depending on the context of its implementation (Amemba et al., 2013). Attaining competitiveness, dematerialisation and reduction in procurement services, corruption among the employees and managers are the major areas that have been noted to be the benefits from the implementation of e-procurement (Mamavi et al., 2014).

The Malaysian government has introduced e-procurement for tendering and online registration of businesses and companies within Malaysia. This e-procurement streamlines government activities with the aim of improving the quality of services it renders. Suppliers could easily participate in the government tendering procedures by subscribing to the e-procurement system, as the system not only eliminates the traditional procurement procedures, but also provides reliable outcomes in a complex environment like government establishments (Pasiopoulos, 2013). As such, the e-procurement helps the businesses to simplify regulatory processes and cuts red-tapism. It also assists the government in online business, especially in such areas like e-marketing strategies. Again, Alshehri and Pasiopoulos (2010) noted that e-procurement system is a useful tool in government to business, by improving the quality of communication and transactions with business. Also, it improves accountability and transparency in government contracts and projects (Moon, 2005).

The e-procurement procedure allows government contracting authorities to procure goods and services from their suppliers electronically, by transforming the hitherto manual procurement procedure into an electronic, internet-based system (Sila, 2013). Suppliers, in turn, benefit from being able to present their products on the World Wide Web. They (suppliers) are able to receive, manage and process government purchase orders, and receive payment from government agencies online by using the e-procurement system. With the automation of the entire procurement cycle in e-procurement system, 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. Evidence from the extant literature reveals important benefits of e-procurement implementation in the government sector (Ojha, and Palvia, 2012).

The E-procurement is known to reduce transaction cost, leading to a better decision and better value in the procurement output. There are also evidences that E-procurement has benefited small business operators to reduce bureaucracy in dealing with the authorities, while also providing access to government electronic market places. Again, some common aims were identified in the implementation of e-procurement in the government sector. These include increasing efficiency in government business; government becomes ecommerce initiator; and public service modernisation (Ojha, and Palvia, 2012).

Procurement refers to a process in which organisations establish agreements for the acquisition of goods or services (contracting) or purchasing goods or services in exchange for payment (purchasing) (Robinson et al., 2010; Rolstadas et al., 2011). Procurement implies gaining merchandise as well as administrations from an outside source. The term procurement is broadly utilised as a part of government; numerous privately owned businesses utilise the terms, buying and outsourcing. Associations or people who give acquirement administrations are alluded to as providers, merchants, temporary workers, subcontractors, or dealers, with providers being the most broadly utilised term (Schwalbe, 2011) In today's market, many organisations introduce themselves to the world by means of their website; they react to tenders utilising web-empowered innovations, oversee and control their book-keeping and data trade utilising electronic means, and they additionally utilise groupware web advancements for sharing learning, basic leadership, coordination, and venture control. Moving from paper-based to question situated information models which have changed a great part of the acquisition procedure and enhance production network reconciliation (Walker and Rowlinson, 2009).

Patel et al. (2016) mentioned that technology or ICT has incredible effect in all parts of life, for example, economy, business, venture and so on. The worldwide economy is presently experiencing basic change in which IT assumes a key part. Data technology has changed the method for working together. Headways in data and correspondence innovations (ICT) have rolled out conceivable central improvements in the strategies for routine of all organisations and ventures. The significance of legitimate administration of acquirement is highlighted by the way that it represents considerable part of association's assets and time. E-procurement refers to the use of information technology in the procurement process (Abu-Elsamen et al., 2010).

According to Roma and McCue (2012), e-procurement is the application of information technology with a view to creating a procurement process that satisfies the dynamics within

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the environment. Implementation of e-procurement in public procurement requires resources and specialised skills. Other factors that are critical in the implementation of e-procurement include good governance and capacity developments (United Nations, 2011). E-procurement became one of the most successful applications in the world, because it had been widely adopted by companies seeking better business processes and an improved bottom line. These advantages had not been lost on governments which engaged in extensive buying activities and are major customers for a wide range of goods and services (Yusof, 2010).

E-procurement is the digitalisation of important aspects of the purchasing process, such as search, selection, communication, bidding or awarding of contracts (Sun et al., 2012). It meant the integration of technological tools into purchasing activities taking place within supply chains while focuses on their operations (Hatice and Mehmet, 2012).

E-procurement is focused on using the internet to operate the transactional aspects of requisitioning, authorising, ordering, receipting and payment processes for the required services or products (CIPS, 2009). E-procurement is a system known for incorporating all purchasing activities such as purchaser request, authorisation, ordering, delivery and payment by utilising electronic means such as internet, web technology and e-commerce (David, 2009).

Based on the overall flow of materials, companies can be seen as being composed of three primary processes: purchasing, manufacturing and distribution (Thawiwinyu and Laptaned, 2009). In the parlance of purchasing, direct procurement addresses all components and raw materials that are used in the manufacturing process of a finished product, such as sheet metal, semi-conductors, and petro-chemicals, whereas indirect procurement relates to products and services for maintenance, repair and operations and focuses on products and services that are neither part of the end product nor resold directly (Puschmann and Alt, 2009). For companies to remain cost-competitive in the market, they must reduce the costs of their components and materials by sourcing from least-cost suppliers. One method to achieve this is through open

bidding via the Internet (Yu et al., 2008). Now a days, since most products and services are procured using electronic data interchange and the Internet, the application of e-procurement is inevitable in both manufacturing and services (Gunasekaran and Ngai, 2008). Therefore, the E-procurement is gaining in popularity in business practice and its benefits encourage its adoption for a variety of areas, including IT purchases (Ronchi et al., 2010).

### 2.2.1 E-procurement for construction projects

Data Technology (IT) is currently routinely utilised as a part of the development business as a device to lessen a portion of the issues created by fracture. The utilisation of IT enhances coordination and joint effort between firms taking an interest in a development extent, prompting to better correspondence rehearses. Its advantages incorporate an expansion in the nature of archives and the speed of the work, better money related control and interchanges, and less complex and quicker access to normal information and a reduction in documentation mistakes (Hatice and Mehmet, 2012).

The investigation of these different ventures demonstrates the many advantages that development could possibly saddle through e-business reserve funds and efficiencies. The recognisable proof of the drivers and obstructions to e-acquisition in development is imperative to picking up a comprehension of how the advantages of e-acquirement can be utilised to expand its take-up and to give a model to implant e-obtainment (Farzin and Teimoori, 2010). Farzin and Teimoori (2010) in their exploration clarified that the E-procurement empowers organisations to decentralise operational acquisition forms and incorporate key obtainment forms as a consequence of the higher production network straightforwardness given by E-acquirement frameworks, and the utilisation of the ICT. E-acquisition can likewise incorporate exercises, for example, Publicising tenders, Electronic requesting, Explore into provider markets, Web sourcing by means of outsiders, Electronic accommodation of tenders, Electronic mail amongst purchasers and vendors, Electronic mail in contract administration

and Joining of obtainment inside the monetary and stock frameworks (Farzin and Teimoori, 2010; Hatice and Mehmet, 2012).

#### 2.3 Challenges Associated with the Current Paper-Based Procurement System

Procurement encompasses the whole process of acquiring property and/or services. It begins when an agency has identified a need and decided on its procurement requirement (Waters 2014). Procurement continues through the processes of risk assessment, seeking and evaluating alternative solutions, contract award, delivery of and payment for the property and/or services and, where relevant, the on-going management of a contract and consideration of options related to the contract. Procurement also extends to the ultimate disposal of property at the end of its useful life (Waters 2014). Government officials and elected leaders have increasingly come to realise that public agencies must utilise ICT in order to enhance the procurement processes in the public sector. Faced with tight budgets and a retiring workforce, today's government agencies are operating in an environment defined by the need to 'do more with less'. Public authorities are expected to provide excellent service to their constituents in an effective and transparent manner, all while working under constant resource constraints by adopting ICT (Hagén, and Zeed, 2015). According to Wee (2012) ethics are the moral principles or values that guide officials in all aspects of their work. Ethical behaviour encompasses the concepts of honesty, integrity, probity, diligence, fairness, trust, respect and consistency. Ethical behaviour includes avoiding conflicts of interest, and not making improper use of an individual's position.

Nigeria joined the league of countries with procurement laws when the Public Procurement Act 2007 was signed into law on June 4, 2007 by the then President, Late Musa Yar' Adua. The purpose of the Act is to ensure transparency, competitiveness, value for money and professionalism in the public sector procurement system (Jacob, 2010). According to Lex Mundi Publication (2012) the essence of the Act is to ensure that all the public procurements are conducted in a manner that is transparent, timely and equitable and based on the agreed guidelines, thresholds and standards. Krivish and Krekele (2013) state that the procurement law is to ensure openness of the procurement procedure, free competition of suppliers as well as equal and fair attitude thereto, effective use of state and local government funds and to reduce the risk of the commissioning party to the minimum.

Public Procurement Acts of most nations especially developing nations have not been able to achieve the purpose for which it was set to achieve (Jacob, 2010). This is because of the challenges, among others, faced by the stakeholders in the implementation of the Acts due to the economic, social and political environment where the Act is operating. According to Jacob (2010), the greatest challenge for the enforcement of procurement law in Nigeria is the involvement of government functionaries in the procurement process and this is possible because government has not fully implemented the provisions of the Act. The Act is a threat to both the executive and the civil servants who argue that they must be involved in the procurement process in order to safeguard public resources (Jacob, 2010). The new procurement regime has limited their capacity to perpetrate those evils that an unreformed process is known for (Mahmood, 2010). Dza et al. (2013) identify the teething problems of the procurement reform as inadequate qualified personnel, the inability of practitioners to adequately and accurately interpret their countries' respective procurement laws, and the perception that corruption is still high. According to Mahmood (2010), contract awards provide opportunity for procurement and there have been reported cases of extensive corruption, political influence and pressure from trade unions in the procurement process. Much as competition and transparency are necessary for any efficient procurement process (Hunja, 2003), the stakeholders are not willing to relinquish their source of illegal avenue to make money, which the procurement law sets to block or reduce.

According to Thai (2011), the basic principles of good procurement practice include accountability, where effective mechanisms must be in place in order to enable procuring entities spend the limited resources carefully, knowing clearly that they are accountable to members of the public; competitive supply, which requires the procurement to be carried out by competition unless there are convincing reasons for single sourcing; and consistency, which emphasises the equal treatment of all bidders irrespective of race, nationality or political affiliation.

Jones (2009) noted that there are number of challenges associated with the current paper-based procurement system in Nigeria. These challenges if not properly addressed could undermine whatever level of success that would have been made in the implementation. Studies have also identified so many challenges facing the implementation of public procurement Act. Despite the seeming progress made in Nigeria, serious weaknesses have persisted in the area of public procurement. These include fragmented procurement procedures; the lack of professional procurement expertise; the absence of open, competitive tendering, especially for foreign suppliers; widespread corruption; and the lack of transparency. In recent years, limited progress has been made in reforming public procurement, but all too often; the reforms have been inadequate and have not had the desired impact so that shortcomings still persist.

### 2.3.1 Difficulties with the traditional/paper based procurement in Nigeria

Review of literature revealed varying problems associated with the traditional procurement system. McConnell (2010) summarised these problems into four broad unique themes of technology, process, people and compliance. Technological problems arise primarily as a result of limited use of technology solution in the traditional procurement process. These problems include: poor data quality, and absence of data harmonization. Process related problems outlined include: slow manual processing, slow transaction processing, large volume of paper

generated, increase handling errors, complicated procedures, difficulty expediting delivery, excessive state intervention, bureaucratic processes, poor centralized control and lack product standardization. People related problems with traditional procurement are key issues identified. These problems have overwhelming influence on technology and process related issues regarding the efficiency of every procurement system. The problems identified therefore include: resistance to change and low internal regard for procurement (McConnell, 2010). In the context of Nigeria, apart from the study of Oyediran and Akintola (2011) and that of Bello and Iyagba (2013) on the state of e-Tendering and the barriers to the uptake of e-Procurement in construction industry, respectively, no study has specifically examined e-Procurement in the building industry in this country. Consequently, there is a limited understanding of the factors militating against the update of e-Procurement and maximisation of its benefits in the Nigerian building industry. It is against this background that the current study investigated the barriers to the uptake of e-Procurement with a view to suggesting ways to ensuring a critical mass uptake and maximising its benefits in the Nigerian building industries.

Ogunsemi et al. (2015) identified the significance of the challenges facing the successful operation of PPA 2007 as follows: size and complexity of procurement, political interference by the executives, shortage of public procurement practitioners, faulty implementation, complexity of procurement regulations, meeting the expectations of stakeholders, incompetency of the practitioners themselves, procurement entities repulsive attitude, delay from Bureau of Public Procurement processes, procurement officials not part of decision makers, and many more. According to Jones (2009), the following are some of the challenges facing PPA:

#### 2.3.2 Legal framework

In the light of various forms of corruption, there is need for the review of legal framework to combat corruption and to require civil servants to declare their assets among other things. The review must take into consideration various forms of corruption taking place in procurement. For example, collusion amongst bidders as a corrupt practice, specified debarment as a sanction against a bidding company engaging in bribery or collusion, and stipulation that officials cannot be appointed to a procurement role if it results in a conflict of interest. These can be complemented by reforms, referred to above, to standardise and clarify procurement procedures. The anti-corruption measures are not sufficiently precise in determining what would be considered a bribe, a collusive practice and a conflict of interest. Equally important, implementation of the anti-corruption measures has been inadequate, resulting from a failure for the most part to properly monitor the procurement process and expose unethical practices, compounded by an unwillingness to apply sanctions against errant officials in the few cases that do come to light. This serves as a serious challenge to due process and procurement (Jones, 2009; Bello and Iyagba, 2013 Agba and Shipman, 201).

#### **2.3.3 Institutional and human resource capacity**

One of the factors contributing to the failings in public procurement in Nigeria has been the absence of central procurement authorities to oversee procurement policy and practices, to review procurement rules, draft bidding documents, advertise intended procurements, and monitor compliance to the rules. A further role of central procurement authorities is to undertake bulk purchasing and provide training for procurement officials (Jones, 2009; Hagén, and Zeed, 2015).

#### 2.3.4 Competition and access

Major barriers still remain preventing the creation of a level playing field for all private domestic suppliers as well as for overseas companies. Such barriers may arise from a bidding

system subject to preferential margins, and quota restrictions, which discriminate against foreign businesses. Competition according to Jones (2009) this may be further curtailed by restricting the eligibility to tender for only domestic bidders or products, or to certain categories of domestic bidder, through set-asides. Eligibility restrictions are often applied in the registration of suppliers and contractors as government trading partners, or in the pre-tender qualification process for major procurements. Alternatively, barriers to open competition may simply be the result of informal practice in which special consideration, as a matter of course, is given to nation-wide domestic enterprises, provincial/local enterprises, State-Owned Enterprises (SOEs) or to businesses to which leaders and senior officials have an association themselves or through family members or cronies. In such cases, the usual method of procurement is limited to single sourcing and direct negotiation (Jones, 2009; Bello and Iyagba, 2013).

#### 2.3.5 Increase corruption rating

Another key challenge facing the governments is combating widespread corruption in the procurement process, as in other sectors of government administration. According to surveys by the World Bank and Transparency International (TI) in 2012, Nigeria stands out as a country with very high corruption indices and these figures continue to rise annually. Although several definitions of corruption were found in the literature, it was commonly referred to as being the exploitation of public power for private benefit (Theis and Stevens, 2007). Public procurement had been identified as the government activity most vulnerable to corruption, collusion, fraud and manipulation (United Nations, 2004). The types of corruption schemes prevalent could be classified under 5 main streams, namely; Kickbacks: Kickbacks were defined as the method where illegal secret payments were made as a return for a favour or a bribe and were usually calculated in the form of a percentage, a share, a cut, a commission or a payoff.; Bias in

contractor selection, preferential treatment for certain contractors. Contractors were allowed to quote higher prices, government agencies were allowed unnecessary purchases, government officials lived beyond their means, and frequent use of the same contractors, receiving of regular gifts from contractors, and Bid rigging happened when group of bidders colluded with one another and kept the bid amount at a pre-determined level. This usually occurred in a competitive public tender environment (Ware et al., 2007). This intentional manipulation as done by the members of the bidding group, who submitted common bids, discouraged a price war (Organization for Economic Co-operation and Development (OECD, 2007). The interested bidders would agree in advance the following details; who would submit competitive bids, at what prices, who would win and how the profits would be shared among the bidders (Jones, 2007). Decentralisation of many due process functions previously undertaken by the Federal Government have been transferred to newly created Budget Monitoring and Price Intelligence Unit (BMPIU) or existing states, and local governments. In countries where democratic reforms have been implemented, these are elected by the local population. Part of their responsibility is to raise a portion of their own revenue through local taxes, although reliance on central government grants still continues. The decentralization reforms have been recommended and guided by international organizations. The lack of proper decentralization affects the implementation of due process (Jones, 2007).

Public procurement is considered an inherently politically sensitive activity. Murray (2009), contended that in public procurement, managers take on the role of agent for elected representatives. However, Pillary (2004) argues that senior officials and political leaders use public office for private gains and this has weakened the motivation to remain honest. Raymond (2008), also opined that ministers and political parties receive clandestine payments in government procurement. This ultimately interferes with the procurement process and constrains compliance. This is also re-echoed by Lodhia and Burritt (2004), who recognise that

social and political influences have an important bearing on public sector reform. In developing countries, one of the major obstacles to the procurement system is ministerial interference with the tender process where ministers intervene and influence tender awards. The threat of being suspended or fired has in many cases intimidated public officers into obeying illegal ministerial directives leading to non-compliance (Akech, 2005). In support of this, Huiet et al. (2011) asserted that interference from the local politicians, businesspersons, members of parliament and very influential top management individuals have interrupted the procurement processes and consequently deterred transparency.

Olateju et al. (2011) identifies the following as potential challenges facing the implementation of public procurement process in Nigeria to be, lack of legal framework, Selection of lowest tender, political will of government, low capacity building for procurement personnel and none operation at state and local government levels.

The public sector needs to ensure effective, sustainable and strategic management of the procurement function. This is vital for economic development and effective service delivery in African countries (Muchaonyerwa, 2014).

Strategic procurement is essential for competitiveness of procurement function in any organisation (Klasa et al. 2018). Research on the topic of procurement strategies has become increasingly prevalent as the function shifted away from a primarily clerical role to a strategic one. A study by Muiga and Kwasira (2016), have been taken to investigate the role of strategic procurement practice in realisation of corporate goals in public sector as well as the relationship between strategic procurement practices and procurement performance in private sector.

Public bodies have always been big purchasers, dealing with huge budgets. Public procurement represents 18.42% of the world GDP (Roodhooft and Abbeele, 2006; Mahmood, 2010). Due to the colossal amount of money involved in government procurement and the fact that such money comes from the public, there is need for accountability and transparency (Hui et al.,

2011). Consequently, various countries both in developed and least developed countries have instituted procurement reforms involving laws and regulations. The major obstacle however, has been inadequate regulatory compliance. Non-compliance problem affects not only the third world countries but also countries in the developed economies. Hui et al. (2011), while analysing procurement issues in Malaysia, established that procurement officers were blamed for malpractice and non-compliance to the procurement policies and procedures.

Most developing countries are facing a problem of rapid changes in procurements which are imparting pressure on how the procurement function performs its internal and external processes in order to achieve its objectives (Wambui, 2013).

### 2.4 Barriers to the Uptake of E-procurement in Building Projects

The literature survey reveals that several authors in different countries have attempted to identify and classify the barriers to the adoption of e-Procurement/e-Commerce (Eei et al., 2012). For example, in a study to identify the benefits and barriers of e-Procurement in Malaysian small and medium enterprises (SMEs), Eei et al. (2012) noted the barriers to the uptake of e-Procurement include external factors such as technology, infrastructure and legislation, environment; and internal factors such as resource constraints and organisational and management characteristics. That study specifically found that e-Procurement was not widely adopted in Malaysia; and that both external and internal factors constituted barriers to the uptake of e-Procurement. The three groups of external barriers identified were technology, infrastructure and legislation, and environment, while resource constraints and organisational characteristics were the two groups of internal barriers militating against the adoption of e-Procurement in that country. In a survey involving 161 SMEs in manufacturing, services, educational, mining, agro-allied, trading, wholesale trade, retail trade, construction, transport and storage, export, tourism and leisure in Nigeria, White et al. (2014) investigated the

challenges to the adoption of E-commerce technology in supply chain management. Eei et al. (2014), classified the barriers to the uptake of e-commerce into two main groups: internal and external factors. Whereas the former deals with those barriers that exist within an organisation such as organisational culture, lack of resources, manager's/owners attitude towards e-Commerce technologies and the level of training of employees, the latter are those outside the immediate control of an organisation, and may include the lack of infrastructural facilities, funds and regulatory framework. Eei et al. (2014) identified the internal barriers to e-Commerce adoption amongst the SMEs sampled to include perception of security and reliability of the technology, lack of adequate skills, lack of awareness of benefits and organizational culture. The external barriers identified were related to infrastructure (e.g. power supply, Internet and funding). Moreover, data integrity and protection as both internal and external barriers to e-Commerce technology adoption among the SMEs. Also in Nigeria. Edwin and Peter (2014) investigated barriers to e-Commerce adoption by SMEs in the different industrial sectors in the cities of Lagos, Abuja and Enugu. The study found that available data show an impressive growth in the rate of adoption of e-Commerce technologies and applications by SMEs in the developed countries such as the UK, USA, Canada, Australia and other emerging markets like China, India, Brazil, Singapore and others. The barriers to e-Commerce uptake in Nigeria include: (i) external environment (e.g. infrastructure, external pressure and socio-cultural factors) (ii) internal environment (size, resource availability, organisational culture and trained labour) (iii) perception (e.g. perceived benefits, risks, trust and cost) and (iv) attitude (e.g. age, occupational relevance, language and education). The most critical barriers to e-Commerce adoption also include the lack of and total absence of a regulatory framework on e-Commerce security, the lack of technical skills and basic infrastructure, the lack of awareness of the potentials of e-Commerce and relative high initial costs in setting up e-Commerce strategies. Elsewhere in Tanzania, Rumanyika and Mashenene

(2014) examined the impediments to e-Commerce adoption among SMEs. Based on a systematic review of published literature, the research revealed that poor telecommunication infrastructure, poor e-Commerce security system, the lack of IT education and training; poor e-Readiness and socio-cultural beliefs and the lack of IT experts are significant impediments limiting the adoption of e-Commerce in Tanzania. The authors concluded that there was a road for all stakeholders to work together in addressing these challenges. From the foregoing review, it is evident that several impediments exist that militate against the uptake of e-Commerce/ e-Procurement technologies among SMEs in the developing countries. These barriers include and not limited to internal barriers, external barriers and perception of the risk factors associated with e-Procurement technologies and processes.

#### 2.4.1 The main barriers to e-procurement

An organisation can use e-procurement to create strategic advantage through improved customer relationships resulting in greater business efficiency and better information access and flexibility. In spite of the many benefits of e-procurement mentioned, the extent of e-procurement adoption in the European Union is below expectations (Lederer *et al.*, 2009). The low adoption rate is due to the comprehensive list of barriers for E-procurement implementation. The list comprises: risk, uncertainty from suppliers, cultural differences, staff resistance to change, catalogue content readiness, etc (Lederer *et al.*, 2009).

One explanation for the low rate of adoption could be that the implementation process of Eprocurement is very complex and that the main benefits of E-procurement can be achieved only in the long term. Arbin (2010) identified barriers specific to the valuation process (industry and organisational barriers) and to the conversion process (resources, knowledge and usage barriers), and in the time of implementing E-procurement. Arbin (2010) noted further, the main barriers to implementing e-procurement to be management barriers, organisational barriers, IT barriers, and users' barriers. Table 2a and 2b highlighted the main barriers to the implementation of e-procurement by different authors.

References
Davila <i>et al.</i> (2003)
Quayle (2005)
Martin $(2008)$
Aik (2005)
Arbin (2002)
Quayle (2005)
Carayammis and Popescu (2005)
Eadie <i>et al.</i> (2007)
Caravammis and Popescu (2005)
Devile of $rl$ (2002)
Davila et al. (2003)
Arbin (2002

# Table 2: The main barriers in implementing e-procurement

Adapted from Corina (2011)

Organizational barriers	- limited resources
	- resistance to change
	- problems in sharing information and
	collaboration
IT barriers	- different cultures
	- internal and external
Users barriers	compatibility
	-breaking up post supplier relationships
	- security of transactions
	- lack of compatibility and integration between
	systems
	- a lack of common technology standards
	- users' resistance to change
	- lack of information system skills
	- fear
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## Table 3: The barriers to implementing e-procurement

The matrix of the main barriers of E-procurement Source: Lederer *et al.* (2009)

Hossain (2016) noted that similarly, there are also numbers of barriers to the adaptation of e-

procurement in the construction industry as identified in various research work by various

researcher, as shown in Table 2:

## Table 4: Barriers to the adoption of e-procurement

SN	Barriers to the implementation of e-procurement	Sources
1	Lack of top management support / lack of Leadership	Davila <i>et al.</i> (2003), Hawking <i>et al.</i> (2004)
2	Other Competing Initiatives	Kheng <i>et al.</i> (2002)
3	Resistance to change	Davila et al. (2003), Martin (2008)
4	Lack of a widely accepted solution	Davila et al. (2003), Martin (2008)
5	Magnitude of Change	Kheng <i>et al.</i> (2002)
6	Lack of a national IT policy relating to e-procurement issues	Carayannis et al. (2005)
7	Lack of Flexibility	Carayannis et al. (2005)
8	Bureaucratic dysfunctionalities	Carayannis et al. (2005)
9	Complicated procedures and extended relationships	Carayannis et al. (2005)
10	Lack of technical expertise	Davila et al. (2003), Martin (2008)
11	Staff turnover	Kransdorff (1998)
12	Slowdown in the uptake of internet services since the dotcom bubble burst	Christensen et al. (2002);
13	Company access to the internet	Smith (2006)
14	Religious objections to the internet	McMullan (2005)
15	Insufficient assessment of systems prior to installation	Forrest (1999);
16	Security in the process - Data transmission to the wrong person	Gebauer <i>et al.</i> (1988), Kheng <i>et al.</i> (2002)
17	Confidentiality of information – unauthorised viewing	Gebauer <i>et al.</i> (1988), Julia-Barcelo (1999)
18	Prevention of tampering with documents - changes to documents	Gebauer <i>et al</i> (1988), Feniosky and Choudary (2001)
19	Data transmission reassembly – incorrect reassembly of data transmitted in	Jennings (2001)
20	Packels Partial Data Display incomplete documents provided	$I_{\text{oppings}}(2001)$
20	Lack of pertinent case law	Hawking at al. (2004) Coopers
21	Lack of pertilient case law	(2002), Julia-Barcelo (1999), Martin (2008)
22	Different national approaches to e-procurement	Carayannis et al. (2005)
23	Proof of intent - electronic signatures	Julia-Barcelo (1999)
24	Clarity of sender and tenderers information	Wright (1999), Dumortier <i>et al.</i> (1999)
25	Enforceability of electronic contracts	Jennings (2001), CITE website (2004)
26	Information technology investment costs	Irani and Love (2002), Wong and
		Sloan (2004), Martin (2008)
27	Cost of assessment of systems to find correct system to fulfil	Forrest (1999), Wong and Sloan
28	Internal Compatibility	Davila et al. (2003) Roging (1006).
20 29	External Compatibility	Davila <i>et al.</i> (2003), Boeing (1990), Davila <i>et al.</i> (2003) Roeing (1996)
30	Investment in compatible systems	Davila et al. $(2003)$ , booing $(1990)$
31	Reluctance to huv-into one off systems	Irani and Love (2002)
51		Hulli ulia 1000 (2002).

Adapted from Corina (2011)

## 2.5 Prospects of E-Procurement Implementation

Awareness about e-procurement is an essential factor in promoting widespread acceptance and usage of e-procurement as a better alternative to the traditional paper-based process (Oyediran and Akintola, 2011). Most developing and developed countries governments would like to implement public e-procurement technology in such a way, as to enhance transparency and accountability in government procurement processes. The basic principle of the government procurement is straightforward: to acquire the right item at the right time within the right price (Neupane et al., 2012).

Kabaj (2009) contends that an efficient public procurement system is vital to the advancement of African countries economies and is a concrete expression of their national commitment to making the best possible use of public resources. Equally, Kakwezi and Nyeko (2010) argue that the procurement departments of public entities in Uganda are faced with the problem of not having enough information about the procurement procedure, its inputs, outputs, resource consumption and results, and are therefore unable to determine their efficiency and effectiveness. This implies that such a problem requires establishment of clear procurement guidelines, procedures and performance standards.

An important issue in public sector management today is the increasing demand for transparency, efficiency and effectiveness in service quality (Ancarani, 2008).

Mohamed (2010) summarised the benefits of e-procurement by noting that (i) e-procurement is an effective communication channel for organising and communicating information, and improving interactivity among project participants (ii) it is also a transaction channel for streamlining transaction process, thereby reducing the complexity of task, paperwork and transaction cost; and (iii) a distribution channel for reducing delivery and operating cost and time.

### 2.5.1 Intended prospects for implementing e-procurement

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Welsh (2009) noted that e-procurement can offer many benefit in the following five ways:

i. Capturing and reducing rogue spending

By 'rogue spending", it means that those spending outside of its procurement contracts. there are many people, particularly when they were not associated with a central group, are actually spending money outside of contracts. This problem has been addressed by implementing e-procurement (Welsh, 2009).

ii. Better analysis, better spending tracking, and better contracting prices

The implementation of e-procurement can facilitate the collection and analysis of spending data. This can ensure better tracking of procurement spending. Thus, company can consolidate spending and leverage such aggregated purchase volume to get a better deal from the suppliers. This can enable the company to have more robust contracts. Therefore, the bottom line of the company can be improved by extracting much overheads out of its procured goods and services through eprocurement (Welsh, 2009).

iii. Cutting out distributors to drive down prices

Another benefit from implementing e-procurement is to low prices of goods purchased by cutting out some of distributors and the middle men. E-procurement provides opportunities for companies to go straight to the source of manufacture. Currently, it is unable to do that and many of the suppliers force it to go through an agent who typically "puts on his 10% or his 15%". Because e-procurement do not recognise any international boundaries, it enables the company to go right back to the source of the manufacturer and to negotiate better prices by cutting out some of the middle people (Welsh, 2009).

iv. Optimising logistics to reduce transportation costs

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Before implementing e-procurement, organisations were able to rely upon a network that funnelled everything through to its distribution depot. Because of implementation of e-procurement, a layer of middlemen or distributor has been taken out. Hence its distribution channel could become wider. This seems to create challenges for the organisations to coordinate its procurement activities. However, the logistics aggregation can be made within the terms (Welsh, 2009).

#### 2.5.2 Benefits of practicing e-procurement

Adopting E-procurement system has brought great benefits to governments and it has been noted as a way by which governments can save management cost and become more efficient in procurement of goods online (Chang and Wong, 2010). The main advantage that e-procurement can deliver include cost reduction, process reorganisation, improved contract fulfilment, among other benefits (Gamal, 2010). The significant cost saving of e-procurement to the government is in the reduction of cost and efforts of processing the purchase order, which can be manipulated electronically, and reduction in inventory costs and decrease in order fulfilment. Eei et al. (2012) identified four types of cost saving from using e-procurement system. These include, order cost, administrative cost, lead-time order cost and opportunity cost of capital.

E-procurement system offers more effective and efficient procurement process in line with the country's transformation to the knowledge based economy (K-economy). It is a way for the government to promote the widespread adoption of e-Business in the country. E-procurement helps provide latest product information and pricing to the government which is available online. The system is supposed to be up to date with the latest information that will help the buyer to make a more accurate procurement decision (Layne and Lee, 2010).

Main benefits of the e-procurement are: Cost savings and subsequent increase in return-oninvestment; upgrade of store network productivity by giving ongoing information with respect to item accessibility, stock level, shipment status, generation prerequisites; assistance of collective arranging among store network accomplices by sharing information on request figures and generation plans that direct production network exercises; intense linkage of customer demand information to upstream SCM (stock system organisation) limits, while in like manner empowering compel SCM operations (Eadie et al., 2011).

### 2.6 Challenges of E-Procurement Implementation in Construction

E-procurement system is a relatively recent development in the business application area. Griffiths and Payab (2010) have identified certain challenges in the implementation of e-procurement such as technology, infrastructure and legislation, environment; besides resource constraints and organisational and management characteristics. External factors from the industry, market, government and technology change are beyond the control of organisations Fernandes and Vieira (2014) noted that these barriers can be minimised and even completely mitigated. Technology barrier to the suppliers includes understanding and commitment to specialist software and the start-up fee that are beyond the capabilities of SMEs required by the vendors. Focus of support for the systems are more on the larger companies. The usefulness and security issues of the system are major concerns for potential adopters (Fernandes and Vieira, 2014).

Wide-spread use of e-procurement system also depends on the availability of supporting infrastructures, such as sufficient broadband coverage, inadequacies in government policies and legislation are areas to be highlighted in the system. The standard procedure for governmental tendering process which mandates the buying of printed tender documents in offices by interested parties is a good example. This prohibits the use of e-tendering system and presents a huge setback for the government attempt to establish on electronic government system (Fernandes and Vieira, 2014).

Lack of standard in the development of E-procurement system results in users of one system not being able to communicate electronically with users of other system, creating a diverse but fragmented E-procurement environment. E-procurement systems are a relatively recent development in the business application area and the lack of benchmark has enabled reference models to be developed, especially in new firms that are just beginning to learn of these systems' functionalities and their uses in their organisations (Nawi et al., 2016)..

External factors from the industry, market, government, and technological change are beyond the control of organisations. However, these barriers can be minimised and even completely mitigated through careful planning and research. The technology barriers to suppliers include understanding and commitment to specialist software and the start-up fee required by the vendors that is usually beyond the financial capabilities of SMEs or that they do not want to commit to such a high-priced system. The declared support of such systems is generally from the larger companies that would benefit more due to the large volume of trade and numerous transactions. The usefulness and security issues of the system are major concerns for potential adopters. The wide-spread use of e-procurement systems also depends on the availability of supporting infrastructures such as sufficient broadband coverage (Nawi et al., 2016).

Inadequacies in government policies and legislation are areas to be highlighted in the system. The standard procedure for governmental tendering process which mandates the buying of printed tender documents in physical offices by interested parties in person is a good example. This prohibits the use of e-tendering system and presents a huge setback for the government attempting to establish and electronic government system. Lack of standards in the development of e-procurement systems results in users of one system being unable to communicate electronically with users of other different systems, creating a diverse but fragmented e-procurement environment (Nawi et al., 2016).

The past research studies have identified challenges faced in the implementation of eprocurement which included; challenges associated with strategic initiative, legal infrastructure, Jerome, (2010), supplier enablement, Filipe, (2009), technological integration and security issues Barcelo (1999). One challenge is to realize that the Internet is not the strategy but rather the tool for developing e-procurement. The Aberdeen group (2010), discovered that supplier enablement, system security, cost implications, legal infrastructure and insecurity in e-transactions are top challenges for e-procurement implementation.

In another study, Falikh (2014) mentioned some problems and difficulties for e-procurement as: absence of products and costs data, access to market is constrained, showcase protected bulkhead, undesirable business rivalry, awful governance, substantial measure of spending plan spent for acquisition, constantly large amounts of spillage in the execution of the financial plan, lack of competent employee, inadequacy of legal framework, inadequate technological infrastructure and security of procurement transaction data. Many classifications for the problems (Patel et al., 2016); Calipinar and Soysal (2012) classified risks for adopting the eprocurement and mentioned to other researchers notes and explanations.

#### 2.7 Strategies for Effective Implementation of E-Procurement

Implementing e-procurement is of strategic, rather than tactical, importance. It should be regarded as an integral part of an organisation's overall e-business strategy because of its enormous expenditure and potential savings. Many companies spend as much as 30 percent of their revenue for indirect procurement, that is, non-production materials and services. Deise et

al. (2009). Traditionally, indirect procurement is a costly pen and paper process that may require more funds just to issue a purchase order. Further, decisions of purchasing many moderated-price goods and services have been at the discretion of individual employees. Finally, as business environment become increasingly competitive, many companies are striving to improve their profitability. Every cent saved in procurement goes straight to the bottom line (Huang, 2012).

## 2.7.1 Strategies for successful implementation of e-procurement in the public sector

Government e-procurement projects have been notoriously unsuccessful. Before launching an e-procurement project, government organisations should consider certain best practices as prerequisites to success (Steinberg, 2010). Because government agencies are increasingly challenged by shrinking tax bases, bigger deficits, budget cuts and the ever-present mantra of "do more with less. E-procurement has been promoted as a way to reduce purchasing cycle times and overall spending.

During the dot-com era of 1999 and 2000, e-procurement was sold to management as a "selffunding" project through which benefits could be achieved by simply putting an application on the Web and assuming that savings from increased purchase volume and transaction fees would cover the costs.

As technologies is maturing, so have government procurement processes. E-procurement's early functionality provided requisition management for white-collar, indirect catalogue items. However, during the past three years, complementary tools have emerged that enable enterprises to create a portfolio of applications for advanced procurement. Additionally, more organisations are undergoing "procurement reform" than ever before, making e-procurement ripe for re-evaluation.

### 2.7.2 Pre-requisites for e-procurement

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Steinberg (2010) noted that the prerequisites for e-procurement strategies are as follows:

**i.** Knowledge of procurement laws

Procurement law is a foundation of e-procurement implementation and can drive its success or failure. Procurement laws typically refers to the combination of laws passed by a legislative body, the case law associated with the statutes, and the administrative policies and procedures that are in use. These laws and policies can govern everything from the levels of approval authority to requirements for certain types of minority-vendor participation. Prior to defining the scope of an e-procurement project, the government entity must understand the implications of the various laws that govern it. Because some forms of e-procurement require business process change that conflicts with public-sector purchasing laws, a team consisting of IT, business and legal representatives should be assigned to document what can be changed or automated, as part of scoping the project (Steinberg, 2010; Huang, 2012).).

### ii. Honesty on procurement values

Good public sector procurement is not the same as good procurement. Unlike commercial organisations, which need to increase shareholder value, governments often are guided by a variety of competing principles that steer employees toward several types of procurement vehicles. Regardless of the ideals of the organisation, government organisations need to understand their drivers and objectively define what they are trying to achieve. Public-sector e-procurement initiatives can be inhibited by public policy objectives, which are contrary to best practice procurement policy. This can be a controversial, highly divisive issue. However, it must be addressed, because the resulting return on investment for e-procurement projects will vary significantly based on the goals and objectives of the procurement. E-procurement projects depend on the ability of the team to properly manage the scope and, therefore, the expectations of the political and executive leadership. If the procurement values cannot be documented, the project team may be unable to properly scope the project. For example, is

"vendor consolidation" at odds with the minority/local participation policies? If so, should we include or exclude e-sourcing from the scope of the project? (See "Road Map for Government Procurement Reform) (Steinberg, 2010; Nawi et al., 2016).

#### iii. Spending vendors

Before embarking on any procurement-related initiative, it is imperative to understand what to buy, from whom to buy it, and what problems you are trying to solve. Some purchases or vendors are not conducive to online transactions. A detailed analysis of purchases for at least a full-year cycle should provide an understanding of the scope of the vendors and the types of products purchased most often. When building the business case and the project plan, focus on areas that will provide the most benefits and let the exceptions remain exceptions. It is unrealistic to try to solve every problem, so focus on those that will provide the best business case (Steinberg, 2010; Huang, 2012).

### iv. Understand sourcing strategies

Intricately linked to the procurement values and knowledge of your vendor base is the need to understand your vendor-sourcing strategies. Strategic sourcing is defined as the process of creating the set of suppliers able to deliver the optimal balance of cost, quality, risk and innovation. Because most e-procurement initiatives are launched (at least in part) to improve the process of buying goods and services, agencies should review their vendors, reconcile the vendor data, reduce the number of qualified vendors and increase the use of indefinite demand/indefinite quantity (IDIQ) (Steinberg, 2010).

### v. Creating a series of master contracts or catalogues

Government organisations worldwide have focused on this strategy to reduce spending and increase the efficiencies of purchasing transactions — often to the chagrin of end users, who find their purchasing capabilities limited by the system to a specific group of contracts. The

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presumption inherent in this strategy is that government organisations need to monitor vendor participation, so that new entrants into a market or technology field can be evaluated for inclusion in the process. Understand the impact of "administrative fees." At the height of the e-procurement craze of 1999 and 2000. many government organisations built business cases on a "self-funding" model that either required vendors to pay a registration fee to be included on the vendor list, or a winning bidder to pay an administrative fee of a certain percentage of the contract value (Steinberg, 2010)..

### vi. Understand the business case

E-procurement projects, like any large government undertakings, are often initiated because the organisation believes it is the right thing to do. Establishing the business case and identifying the benefits that an agency expects to generate are critical to defining and managing the scope of the project. For example, if the business case involves improving the efficiency of the procurement process, then the focus of the project may be purchase-order processing. If the goal is to reduce overall spending by consolidating purchases across departments, then esourcing functionality may be the priority (Huang, 2012).

#### vii. Grant responsibilities to employees with care

E-procurement projects should push decision making to the "right" level in the organisation, with the goal of improving efficiency by reducing the number of approval levels necessary to complete a transaction.

E-procurement system projects are common with opportunities to empower first-line supervisors and managers — and often the business case assumes that first-line managers will

take on currently centralised responsibilities. Many employees, however, are not ready or not properly trained to manage these new responsibilities. When developing the business case for e procurement, government organisations should carefully consider the impact on employees, since process improvements may be more difficult to achieve than expected, and keep in mind. Not every employee will be capable of managing a budget. Not every employee should be trusted with the right to spend government funds. Most employees will need to be trained before they are granted the authority to spend money (Steinberg, 2010; Huang, 2012).

### viii. Do not forget the architectural impact

E-procurement systems are typically designed for large private organisations with well-defined policy and governance structures. E-procurement implementation in the public sector is often more complicated because individual agencies (even within a single government entity) enjoy diverse levels of autonomy and, in some instances, different procurement policies. For example, in many large multiagency government organizations, all technology purchases are aggregated from all agencies with the exception of the technology agency, which has the autonomy to purchase on its own. The variability in autonomy levels and policies may require agencies to support "multi-enterprise" e-procurement architectures, especially in the presence of a variety of price schedules and aggregate-buying plans. Government organisations should develop a technical plan that takes into account all of the components necessary to achieve procurement objectives/business case often including the need for a complex, Web-based, quasi-decentralised environment to ensure that the full architectural impact of the solution is addressed properly (Steinberg, 2010; Huang, 2012).

#### ix. Take security seriously

Regardless of the functionality to be deployed, organizations with extensive Web architectures are candidates for security attacks. Don't underestimate the need to plan and manage security, and build such planning into budget estimates. Newspaper headlines of security breaches are often just as painful to a government organization as the cost of the breach itself. That involved secure tender opening (e.g. being only able to open tenders which had been submitted by the closing date and time), tender evaluation and tender award. That was facilitated by electronic procurement system (Daniel, 2009).

## **CHAPTER THREE**

3.0

### **RESEARCH METHODOLOGY**

**3.1 Research Design** 

Design in research is the overall plan for connecting the conceptual research problems to the pertinent empirical research. It articulates what data is required, what methods are going to be used to collect and analyse the data (Van-Wyk, 2015). This study adopted a survey design approach using the quantitative method by administering well-structured questionnaires.

### **3.2 Research Population**

Population according to Given (2018) is the entire number of people or inhabitants in a country or region. Population in research refers to every individual who fit the criteria that researcher has laid out for research participants (Given, 2008). The population for this research constitute the procurement units of the 12 branches of the FCTA secretariat, comprising of a total of 187 procurement staff.

### 3.3 Sampling Frame

The sample frame according to Research Lifeline is expressed as the complete list of the population from which the sample is selected. The sample frame for this study include the procurement units of the following: FCT Procurement, FCT Secondary Education Board, FCT Universal Basic Education Board, FCT Education Secretariat, FCT Transport Secretariat, FCT Agricultural Secretariat, FCT Area Council Service Commission, FCT Water board, FCT Inland Revenue Services, FCT Environmental Protection Agency, FCT Health secretariat, Abuja Metropolitan Management council (AMMCI). The group of respondents include: Procurement officers, Quantity Surveyors, Architectures, Builders, Services Engineers. These are the professionals working directly in the procurement units of the stated organisations.

#### 3.4 Sample Size

Sample size denotes the number of individual pieces of data collected in a survey. It measures the number of individual sample observations used in the survey. Sample size is important in determining the accuracy and reliability of a survey's finding (Zamboni, 2017).

The samples size for this research was developed from a population of 187 procurement staff members of the population as shown in Table 3.1. The value was subjected to Krejcie and Morgan Table for determining sample size at 5% limit of error and at 95% confidence level. The value of 187 was reduced to 123, which is the minimum sample of questionnaire to be administered. Therefore 123 represents the sample size for the study.

S/N	Organisations	Procurement officers	Quantity Surveyors	Architecture	Builders	Engineer	Population Size	Sample size
1	FCT Procurement	12	2	0	0	0	14	
2	FCT Secondary Education Board	5	5	6	4	6	26	
3	FCT Universal Basic Education Board	4	5	5	4	5	23	
4	FCT Education Secretariat	7	7	7	2	15	38	
5	FCT Transport Secretariat	4	0	0	0	0	4	
6	FCT Agricultural Secretariat	4	2	2	1	2	11	
7	FCT Area Council Service Commission	4	2	1	0	0	7	
8	FCT Water board	5	2	0	0	2	9	
9	FCT Inland Revenue Services	2	1	0	0	0	3	
10	FCT Environmental Protection Agency	5	1	0	0	0	6	
11	FCT Health secretariat	2	2	2	1	1	8	
12	Abuja Metropolitan Management Council (AMMCI)	8	9	10	5	6	38	
	Total	62	38	33	17	37	187	123

#### Table 3.1: Sample size for the study

### **3.5 Sampling Technique**

Sampling techniques helps research in selection of elements that form part of the population (Morenikeji, 2006). Sampling technique can be categorised into two namely: Non-probability and probability sampling and. The probability sampling method is any method of sampling that utilises some form of random selection; they are subdivided into simple random sampling, systematic random, stratified random, cluster random sampling, multi-stage sampling. Non-

probability sampling does not depend on the rationale of probability theory, examples include convenience sampling and purposive sampling, (Trochim, 2007).

For the purpose of this study, stratified random sampling procedure was adopted that is by grouping each set of respondents (procurement officers, Quantity Surveyors, Architects etc) and subsequently selecting members in each group at random to enable every respondent have equal chances selection within the population.

#### **3.6 Method of Data Collection**

The research commenced with the reviews of the related literature, in order to determine the theoretical background of the research, and what sorts of primary data to be sought for. A structured questionnaire was then designed and administered to examine the challenges associated with the paper based procurement system; barriers to the up-take of e-procurement in FCTA; prospect of e-procurement implementation; challenges of implementing e-procurement; and strategies for effective implementation of e-procurement in the FCTA. The questionnaire was designed in two sections. Section 'A' comprising the general information of the respondents and section 'B' comprised structured questions on a 5-Point Likert scale on the research objectives 1-5.

### 3.7 Methods of Data Analysis

The collected data were analysed using both descriptive and inferential methods. The descriptive methods include percentages and frequency distributions for analysing the demographic information of the respondents and the preliminary questions.

The Relative Importance Index (RII) was used to analyse the important challenges with the paper based procurement system and the strategies for effective implementation of eprocurement in the FCTA (objectives 1 and 5). Mean Item Score (MIS) was used to rank on average the important factors in the remaining objectives (2, 3 and 4). The inferential analytical tool (Kruskal Wallis Test) was used to test the difference in respondents' views.

The formula for Mean Item Score (MIS) is written as:

Mean Item score (MIS) = 
$$\frac{5n_5 + 4n_4 + 3n_4 + 2n_2 + 1n_1}{n_5 + n_4 + n_3 + n_2 + n_1}$$
(3.1)

The formula for Relative Important Index is written as

Relative Important Index (RII) = 
$$\frac{\sum P_i U_i}{A \times N}$$
(3.2)

## Where;

 $P_i$  = respondent rating of factors,

U<sub>i</sub> = Number of respondents placing identical weighting/rating on factor

A = highest weighting (i.e 5 in this case)

N = Sample size.

#### **CHAPTER FOUR**

### 4.0

### **RESULTS AND DISCUSSION**

### **4.1 Respondents General Information**

Based on the sample size of 123 respondents, 145 questionnaires were administered and 133

were returned and considered valid for the analysis.

Table 4.1 shows the result of the analysis of the respondents' general information. The analysis established that most (76.0%) of the respondents sampled are males while 24.00% are females.

In terms of professionals' representation/responsibility, the result revealed that procurement officers were more with 40.60%, followed by Quantity Surveyors with 27.07%, then Engineers with 12.03%, then Architects with 10.53%, and lastly the Builders with 9.77%. This implies that majority of the respondents were predominantly procurement officers and Quantity Surveyors.

A look at the year of work experience of the respondents shows that only 15% of the respondents have their year of working experience to fall within less than 5 years range, while 28% and 33% falls between the range of 5 to 10 and 11 to 20 years respectively. Also 18.0% and 6.0% of the population falls between the ranges of 21 to 30 years and above 30 years respectively. However, the average years of working experience of the respondents is calculated as approximately 10.82 years. This implies that they are experienced enough to give a valid response.

In terms of academic qualification, the highest is BSc/MTech (49.0%), followed by HND (22.0%), then MSc/MTech (21.0%), and others are 8.0%.

Based on the result on the respondents' background information, it was concluded that the respondents are well equipped professionally and in terms of experience to give reasonable insight in the subject under consideration.

	Variables	Frequency	percent
Gender	Male	101	76.00%
	Female	32	24.00%
	Total	133	100%
Profession/Responsibility	Architect	14	10.53%
	Builder	13	9.77%
	Engineer	16	12.03%

**Table 4.1 Respondents general information** 

	Quantity Surveyor	36	27.07%
	Procurement officers	54	40.60%
	Total	133	100%
Years of Experience	Less than 5 years	15	15.00%
	5-10years	28	28.00%
	11-20years	33	33.00%
	21-30years	18	18.00%
	Above 30	6	6.00%
	Total	100	100%
Academic qualification	ND	0	0.00%
	HND	22	22.00%
	BSc/BTech	49	49.00%
	MSc/MTech	21	21.00%
	Others	8	8.00%
	Total	100	100%

## 4.2 Level of Awareness and Implementation of E-Procurement

Table 4.2 shows the level of awareness and implementation of e-procurement on public works. The result reveals that the level of awareness of e-procurement lies between high and very high with a combine percent of 77.0%. However, the awareness of implementation of e-procurement in the respondents' organisation showed that it ranges between low to very low with a combine weighting of 84%. It is therefore, concluded that despite the fact that the awareness level is high, the level of implementation of e-procurement in the FCTA is very low

		Freq.	Percent	Cum. Percent
	Very Low	3	2.300%	2.300%
	Low	5	3.76%	6.06%
Level of awareness of e-	Undecided	15	11.28%	17.34%
procurement	High	35	26.32%	53.66%
	very High	75	56.39%	100.00%
	Very Low	52	52.00%	52.00%
Awaranass of implementation of a	Low	32	32.00%	84.00%
Awareness of implementation of e-	Undecided	10	10.00%	94.00%
procurement in your organisation	High	5	5.00%	99.00%
	very High	1	1.00%	100.00%

Table 4.2 level of awareness and implementation of e-procurement

## 4.3 Challenges Associated with the Current Paper-Based Procurement System

Table 4.3 shows the result of the analysis of the data gathered on the challenges associated with the current paper-based procurement system. The result shows that the top five (5) challenges associated with the current paper-based procurement system practices in public sector are: Poor legal framework and corruption (RII=0.978), Lack of transparency (RII=0.952), Political interference by the executives (RII=0.928), Complexity of procurement regulations (RII=0.928), and Inadequate institutional and human resource capacity (RII=0.916).

Kruskal-Walis test was also carried out at 95% confidence level. The test showed that there is no significant difference in the ranking of the 71.43% of the variables. There seem to be consistencies in the perception of the various respondents group regarding the variables. These variables recorded a significant p-value of above 0.05, thus are 'accepted'. Only 28.57% of the variables show a significant difference in the perception. These variables recorded a significant p-value of less than 0.05, thus are 'rejected'. It can be concluded that there is consistency in the ranking and views of the respondents regarding the challenges associated with the current paper-based procurement system.

		1		•	
S/N	Variables		Rank	Kruskal Wallis Test	
				<b>P-value</b>	Decision
1	Lack of traditional professional procurement expertise	0.656	$14^{th}$	0.969	Accept
2	Absence of open and competitive tendering	0.844	$8^{th}$	0.000*	Reject
3	Lack of transparency	0.952	$2^{nd}$	0.996	Accept
4	Poor legal framework and corruption	0.978	$1^{st}$	0.913	Accept
5	Inadequate institutional and human resource capacity	0.916	5 <sup>th</sup>	0.216	Accept
6	Size and complexity of procurement	0.840	$9^{\text{th}}$	0.000*	Reject
7	Political interference by the executives	0.928	3 <sup>rd</sup>	0.950	Accept
8	Shortage of experienced procurement practitioners	0.830	$10^{\text{th}}$	0.972	Accept
9	Faulty implementation of procurement system	0.726	$13^{th}$	0.722	Accept
10	Complexity of procurement regulations	0.928	$3^{rd}$	0.977	Accept

 Table 4.3: Challenges associated with the current paper-based procurement system

11	Exclusion of procurement officials from decision making process of tender selection	0.906	6 <sup>th</sup>	0.000*	Reject
12	Incompetency of the procurement practitioners	0.826	$11^{\text{th}}$	0.974	Accept
13	Procurement entities repulsive attitude	0.802	$12^{th}$	0.913	Accept
14	Delay from Bureau of Public Procurement processes	0.850	$7^{\text{th}}$	0.017	Reject
*P-val	ue <0.05				

#### 4.4 Barriers to the Uptake of E-Procurement in FCTA Abuja Building Projects

Table 4.4 shows the result of the analysis of the data collected on the barriers to the uptake of E-procurement in FCTA Abuja building projects. The result shows that: Lack of technical expertise (MIS=4.76), Unreliable power supply (MIS=4.68) Inadequate government support (MIS=4.65), Poor ICT and internet infrastructure (MIS=4.65), High costs of implementation (MIS=4.64), Resistance to change (MIS=4.64), Poor financial base (MIS=4.64), Lack of top management support (MIS=4.61), Lack of common technology standards (MIS=4.37), and Unavailability of e-procurement applications software and tools ((MIS=4.23); are the key barriers to the uptake of E-procurement in FCTA Abuja building projects.

Kruskal-Walis test was also conducted at 95% confidence level. The test showed that there is no significant difference in the ranking of the 72.73% of the variables. There seem to be consistencies in the perception of the various respondents group regarding the variables. These risks factors recorded a significant p-value of above 0.05, thus are 'accepted'. Only 27.27% of the variables show a significant difference in the perception. These barriers had their significant p-value of less than 0.05, thus are 'rejected'. It can be concluded that there is consistency in the ranking and views of the respondents regarding Barriers to the uptake of E-procurement in FCTA Abuja building projects.

	<b>1</b>				,	01 0	
S/N	Barriers to the uptake of E-procurement	MIS	S.D	Rank	Kruskal Wallis Test		
				1.unn	<b>P-value</b>	Decision	
1	Lack of top management support	4.61	1.1361	8 <sup>th</sup>	0.540	Accept	
2	Inadequate government support	4.65	0.7703	3 <sup>rd</sup>	0.624	Accept	
3	High costs of implementation	4.64	0.4824	$5^{th}$	0.950	Accept	
4	Lack of technical expertise	4.76	0.4292	1 <sup>st</sup>	0.996	Accept	

Table 4.4: Barriers to the uptake of E-procurement in FCTA Abuja building projects

5	Security of transactions	3.15	0.7833	22 <sup>nd</sup>	0.968	Accept
6	Lack of common technology standards	4.37	0.4852	9 <sup>th</sup>	0.999	Accept
7	Time needed for the implementation process	3.67	1.5046	$16^{th}$	0.000*	Reject
8	Resistance to change	4.64	0.4824	$5^{th}$	0.950	Accept
9	Lack of skilled personnel	4.15	0.9252	$11^{\text{th}}$	0.972	Accept
10	Complicated and extended procedures	3.63	0.4852	$17^{th}$	0.722	Accept
11	Poor financial base	4.64	0.4824	$5^{\text{th}}$	0.977	Accept
12	Lack of confidentiality and flexibility	3.62	1.4756	$18^{th}$	0.000*	Reject
13	Fear for loss of jobs and end to corruption	4.13	0.5972	$12^{th}$	0.974	Accept
14	Unreliability of the technology	4.01	0.8586	$13^{th}$	0.913	Accept
15	Reduction in the level of personal contacts	3.80	1.2949	$14^{th}$	0.0008	Reject
16	Illegality of e-procurement contact	3.47	1.6724	$20^{\text{th}}$	0.000*	Reject
17	Poor ICT and internet infrastructure	4.65	0.7437	3 <sup>rd</sup>	0.245	Accept
18	Unreliable power supply	4.68	0.5840	$2^{nd}$	0.640	Accept
19	Lack of national ICT policy	3.42	1.0168	21 <sup>st</sup>	0.305	Accept
20	Cost of e-procurement technology	3.73	1.3170	$15^{\text{th}}$	0.051	Accept
21	Lack of uniform standard for implementation of e-procurement system	3.52	1.3218	19 <sup>th</sup>	0.000*	Reject
22	Unavailability of e-procurement applications software and tools	4.23	1.2541	10 <sup>th</sup>	0.001*	Reject

\*P-value <0.05.

### 4.5 Prospects of E-Procurement Implementation in the FCTA

Table 4.5 shows the result of the analysis of the data collected on the prospects of eprocurement implementation. It can be seen that the leading prospects according to the respondents are; Good governance in Reduction of collusion among the bidders (MIS=4.65), Transparency and openness of information in public procurement (MIS=4.54), Good governance in pre-qualifying process (MIS=4.43), Cost and time savings in Sending Tender Evaluation Report to Approving authority for approval (MIS=4.42), Transparency in secrecy of bidders information (MIS=4.17), Cost and time savings in issuance of Notification of Award & communicate with renderer (MIS=4.13), Transparency in Public accessibility to the information of tender process (MIS=4.02), Cost and time savings of pre-tender meeting (MIS=3.96), Improvement of the entire tendering process (MIS=3.96), and Efficiency in Reduction of errors (MIS=3.93). Kruskal-Walis test carried out at 95% confidence level shows that there is no significant difference in the ranking of the 75.86% of the variables. There seem to be consistencies in the perception of the various respondents group regarding the variables. These risks factors recorded a significant p-value of above 0.05, thus are 'accepted'. 24.14% of the variables show a significant difference in the perception. These prospects recorded a significant p-value of less than 0.05, thus are 'rejected'. It can be concluded that there is consistency in the ranking and views of the respondents regarding the prospects of e-procurement implementation in FCTA Abuja

					Krusk	al Wallis
S/N	Prospects of e-procurement implementation	MIS	S.D	Rank	Т	est
					P-value	Decision
1	Good governance in Reduction of collusion among the bidders	4.65	0.702	1	0.695	Accept
2	Transparency and openness of information in public procurement	4.54	1.123	2	0.504	Accept
3	Good governance in pre-qualifying process	4.43	1.085	3	0.663	Accept
4	Cost and time savings in Sending Tender Evaluation Report to Approving authority for approval	4.42	1.084	4	0.702	Accept
5	Transparency in secrecy of bidders information	4.17	1.223	5	0.929	Accept
6	Cost and time savings in issuance of Notification of Award & communicate with renderer	4.13	0.981	6	0.921	Accept
7	Transparency in Public accessibility to the information of tender process	4.02	1.189	7	0.721	Accept
8	Cost and time savings of pre-tender meeting	3.96	0.816	8	0.225	Accept
9	Improvement of the entire tendering process	3.96	0.816	8	0.225	Accept
10	Efficiency in Reduction of errors	3.93	1.373	10	0.903	Accept
11	Transparency in scope of online vigilance and monitoring	3.92	1.169	11	0.654	Accept
12	Cost and time savings in Contract agreement	3.88	1.274	12	0.135	Accept
13	Process improvement in Managing capacity of large number of bidders	3.86	1.164	13	0.135	Accept
14	Transparency in real time access of information and bidding	3.85	1.132	14	1.929	Accept
15	Efficiency in positive change of staff concentration	3.85	1.321	14	0.628	Accept
16	Process improvement in e-contract management system	3.83	1.303	16	0.000*	Reject
17	Cost and time savings in advertisement of tender notice	3.76	1.357	17	0.000*	Reject
18	Process improvement in Automatic generation of necessary report	3.72	1.341	18	0.000*	Reject
19	Guaranteeing of best quality with little price	3.62	1.369	19	0.000	Reject
20	Cost and time savings intender collection from multiple locations	3.52	1.049	20	0.861	Accept
21	Efficient selection criteria of bidders	3.52	1.049	20	0.861	Accept
22	Process improvement in Accuracy of purchase decisions	3.52	1.329	20	0.000*	Reject
23	Cost and time savings in preparation of tender documents	3.45	1.321	23	0.172	Accept
24	Process improvement in workflow management	3.43	1.444	24	0.000*	Reject
25	Cost and time sayings in tender Evaluation Report process	3.42	1.249	25	0.760	Accept

Table 4.5: Prospects of e-procurement implementation in FCTA Abuja

26	Good governance in competition among the bidders	3.42	1.249	25	0.760	Accept			
27	Process improvement in Automation of procurement	3.26	1.307	27	0.116	Accept			
28	Efficient and flexible Procurement process	3.11	1.325	28	0.102	Accept			
29	Efficiency in cash flow improvement compared to manual	3.02	1.239	29	0.003*	Reject			
*P-	*P-value <0.05.								

### 4.6 Challenges of Implementing E-Procurement in the FCTA Public Sector

Table 4.6 shows the result of the analysis of the data gathered on the challenges of implementing E-procurement by Public sector. The top challenges are inadequate financial resources and backing (MIS=4.93), Inadequate technological infrastructure of tenderers (MIS=4.44), Internal user resistance to learn multiple procurement systems and procedures (MIS=4.44), Lack of competent employee on e-procurement (MIS=4.34), and Training of contractors (MIS=4.22).

Kruskal-Walis test carried out at 95% confidence level shows that there is no significant difference in the ranking of the 80.0% of the variables. There seem to be consistencies in the perception of the various respondents group regarding the variables. These risks factors recorded a significant p-value of above 0.05, thus are 'accepted'. 20.0% of the variables show a significant difference in the perception. These prospects recorded a significant p-value of less than 0.05, thus are 'rejected'. It can be concluded that there is consistency in the ranking and views of the respondents regarding the challenges of implementing E-procurement by Public sector.

					Kruskal Wallis	
S/N	Challenges of implementing F-procurement	МІС	S.D	Rank	Test	
5/11	Chanenges of implementing E-procurement	MIS			Р-	Decision
					value	Decision
1	Inadequate financial resources and backing	4.93	0.3828	1	0.058	Accept
2	Inadequate technological infrastructure of tenderers	4.44	0.9355	2	0.125	Accept
3	Internal user resistance to learn multiple procurement systems and procedures.	4.44	0.9025	2	0.835	Accept
4	Lack of competent employee on e-procurement	4.34	0.8554	4	0.402	Accept
5	Training of contractors	4.22	1.0109	5	0.109	Accept
6	Most information is considered as confidentiality	4.16	1.0610	6	0.000*	Reject
7	Protection against hacker, virus etc	4.13	1.0508	7	0.160	Accept

Table 4.6: Challenges of implementing E-procurement by Public FCTA Abuja

8	Lack of interest in e-procurement	4.11	1.2135	8	0.055	Accept
9	Inadequate technological infrastructure to implement the process	4.08	0.9917	9	0.103	Accept
10	Insufficient training on procurement and other indirect costs.	4.04	0.9632	10	0.121	Accept
11	Organisation culture, bureaucratic inertia or processes.	4.01	1.1503	11	1.137	Accept
12	Stakeholders Awareness	3.76	1.0359	12	0.025*	Reject
13	Lack of change management, top management support	3.71	1.1917	13	0.023*	Reject
14	Awareness Acceptability of new system by all stakeholders	3.54	1.4172	14	0.174	Accept
15	Logistic support –Scanner, printer etc.	3.44	1.8220	15	0.402	Accept

\*P-value < 0.05

#### 4.7 Strategies for Effective Implementation of E-Procurement in the FCTA

Table 4.7 shows the result of the analysis of the data gathered on strategies for effective implementation of e-procurement in the public sector. The result shows that the prominent strategies for effective implementation of e-procurement in public sectors are;

Assessing and documenting the current procurement process (RII=0.956), Review and select the optimal e-procurement solution provider for your needs (RII=0.868), Document the important benefits that will come from implementing an e-procurement system (hard, soft and intangible benefits) (RII=.0.864), Identify the process and system solutions that will be required to bridge the gaps (RII=0.858), and Secure executive sponsorship and an internal champion for the initiative (RII=0.856).

Kruskal-Walis test carried out at 95% confidence level shows that there is no significant difference in the ranking of the 80.0% of the variables. There seem to be consistencies in the perception of the various respondents group regarding the variables. These risks factors recorded a significant p-value of above 0.05, thus are 'accepted'. 20.0% of the variables show a significant difference in the perception. These prospects recorded a significant p-value of less than 0.05, thus are 'rejected'. It can be concluded that there is consistency in the ranking and views of the respondents regarding the Strategies for effective implementation of e-procurement in the public sector.

### Table 4.7: Strategies for implementation of E-procurement in the FCTA Abuja

				Kruskal Wallis Test	
S/N	strategies for effective implementation of e-procurement	RII	Rank	P- value	Decision
1	Assessing and documenting the current procurement process.	0.956	$1^{st}$	0.114	Accept
2	Assess and document your desired future procurement strategy.	0.830	6 <sup>th</sup>	0.012*	Reject
3	Identify the gaps between where you are now and where you want to be.	0.790	9 <sup>th</sup>	0.277	Accept
4	Identify the process and system solutions that will be required to bridge the gaps.	0.858	$4^{th}$	0.0068	Reject
5	Document the important benefits that will come from implementing an e-procurement system (hard, soft and intangible benefits).	0.864	3 <sup>rd</sup>	0.269	Accept
6	Develop key performance indicators (KPIs) to measure success against your identified procurement goals.	0.796	8 <sup>th</sup>	0.001*	Reject
7	Create a business case that addresses the most critical pain points of your buying organization.	0.716	$11^{\text{th}}$	0.283	Accept
8	Secure executive sponsorship and an internal champion for the initiative.	0.856	$5^{th}$	0.027*	Reject
9	Develop a plan and commit resources to the project.	0.812	$7^{\text{th}}$	0.001*	Reject
10	Review and select the optimal e-procurement solution provider for your needs.	0.868	$2^{nd}$	0.229	Accept
11	Create an implementation plan that reduces deployment/maintenance times and resource demands on your IT department.	0.678	12 <sup>th</sup>	0.206	Accept
12	Deliver and measure the benefits.	0.726	$10^{\text{th}}$	0.131	Accept

\*P-value < 0.05

### 4.8 Discussion of Findings

The study found that the level of awareness of e-procurement in FCTA is high but the implementation is at a very low level.

The study revealed that the challenges associated with the current paper-based procurement system are; Poor legal framework and corruption, Lack of transparency, Political interference by the executives, Complexity of procurement regulations, and inadequate institutional and human resource capacity. These results are in lie with the findings of Jones (2009); Waters (2014); and (Hagén, and Zeed, 2015) on the challenges of the paper based procurement methods.

The study revealed that barriers to the uptake of E-procurement in FCTA Abuja building projects are: lack of technical expertise, unreliable power supply, inadequate government

support, poor ICT and internet infrastructure, high costs of implementation, resistance to change, poor financial base, Lack of top management support, lack of common technology standards, and unavailability of e-procurement applications software and tools these results are in line with the findings of Quayle (2005) on the lack of technical expertise on implementation of e-procurement; the findings also corroborates the findings of Carayammis and Popescu (2005).

The study revealed that e prospects of e-procurement implementation are; good governance in reduction of collusion among the bidders, transparency and openness of information in public procurement, good governance in pre-qualifying process, cost and time savings in sending tender evaluation report to approving authority for approval, transparency in secrecy of bidders information, cost and time savings in issuance of notification of award & communicate with renderer, transparency in public accessibility to the information of tender process, and cost and time savings of pre-tender meeting price. These findings are in line with those of Oyediran and Akintola, (2011) Neupane et al. (2012) on the prospects of e-procurement implementation in the public sector.

It was revealed that the challenges of implementing E-procurement by Public sector are: Inadequate financial resources and backing, Inadequate technological infrastructure of tenderers, internal user resistance to learn multiple procurement systems and procedures, Lack of competent employee on e-procurement, and training of contractors. These findings validate the results of Griffiths and Payab (2010) who have identified certain factors contributing to challenges in the implementation of e-procurement such as technology, infrastructure and legislation. External factors from the industry, market, government and technology change are beyond the control of organizations Fernandes and Vieira (2014) and those of Nawi et al. (2016) and Falikh (2014). The highest ranked strategies for effective implementation of e-procurement in public sectors are: Assessing and documenting the current procurement process, Review and select the optimal e-procurement solution provider for your needs, Document the important benefits that will come from implementing an e-procurement system (hard, soft and intangible benefits), Identify the process and system solutions that will be required to bridge the gaps, and Secure executive sponsorship and an internal champion for the initiative. These results are in line with the findings of Deise et al. (2009) and Steinberg (2010) on the strategies for implanting e-procurement in public sector.

### 4.9 Summary of the Research Findings

- i. It was found that the level of awareness of e-procurement in FCTA is high but the implementation is very low.
- **ii.** The top challenges associated with the current paper-based procurement system are: Poor legal framework and corruption, lack of transparency, political interference, complexity of procurement regulations, and inadequate institutional and human resource capacity.
- iii. The barriers to the uptake of E-procurement in FCTA Abuja building projects are: Lack of technical expertise, Unreliable power supply, Inadequate government support, Poor ICT and internet infrastructure, High costs of implementation, Resistance to change, Poor financial base, Lack of top management support, Lack of common technology standards, and Unavailability of e-procurement applications software and tools
- **iv.** The top prospects of e-procurement implementation are: Good governance in Reduction of collusion among the bidders, Transparency and openness of information in public procurement, Good governance in pre-qualifying process, Cost and time

savings in Sending Tender Evaluation Report to Approving authority for approval, and Transparency in Public accessibility to the information of tender process.

- v. The challenges of implementing E-procurement in FCTA are inadequate financial resources and backing, Inadequate technological infrastructure of tenderers, Internal user resistance to learn multiple procurement systems and procedures, Lack of competent employee on e-procurement, and Training of contractors.
- vi. The strategies for effective implementation of e-procurement in public sectors are: Assessing and documenting the current procurement process, Reviewing and selecting the optimal e-procurement solution provider for your needs, Documenting the important benefits that will come from implementing an e-procurement system (hard, soft and intangible benefits), Identifying the process and system solutions that will be required to bridge the gaps, and Securing executive sponsorship and an internal champion for the initiative.

#### **CHAPTER FIVE**

### 5.0 CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusion of the Study

The study set out to explore the prospects of implementation of e-procurement system in the public sector of the FCTA, Abuja with a view to mitigating procurement fraud in Nigeria.

The study concludes that the major challenges associated with the current paper-based procurement system are poor legal framework and corruption, lack of transparency, political

interference by the executives, complexity of procurement regulations, and inadequate institutional and human resource capacity. In addition, the barriers to the uptake of Eprocurement in FCTA building projects are lack of technical expertise, unreliable power supply, inadequate government support, poor ICT and internet infrastructure, and high costs of implementation.

The study also concludes that the leading prospects of e-procurement implementation are good governance in reduction of collusion among the bidders, transparency and openness of information in public procurement, good governance in pre-qualifying process, cost and time savings in sending tender evaluation report to approving authority for approval, and transparency in secrecy of bidder's information.

Also concluded that the main challenges of implementing E-procurement by are inadequate financial resources and backing, Inadequate technological infrastructure of tenderers, Internal user resistance to learn multiple procurement systems and procedures, Lack of competent employee on e-procurement, and Training of contractors. Similarly, the prominent strategies for effective implementation of e-procurement in public sectors are; Assessing and documenting the current procurement process, Review and select the optimal e-procurement solution provider for your needs, document the important benefits that will come from implementing an e-procurement system (hard, soft and intangible benefits) , Identify the process and system solutions that will be required to bridge the gaps, and Secure executive sponsorship and an internal champion for the initiative.

### 5.2 Recommendations by the Study

From the findings and conclusion, the study makes the following recommendation

I. Government should come up with policies and framework that will mandate all public sector projects to be procured through e-procurement platform.

- II. In order to guarantee the quick uptake of e-procurement in the FCTA secretariat, government and top management must ensure ample support to the system.
- iii. Continuous training and retraining of procurement officers and other construction professional the application and use of e-platforms for procurement. This will increase the technical capability and skilled manpower available.
- iv. The success of e-procurement is dependent on regular and reliable power supply and the provision of ICT supports facilities.
- **v.** The level of political interference with public project procurement using e-procurement system should be minimised or even stopped.
- vi. Transactions with E-procurement system should be kept open to public scrutiny.

### **5.3** Contributions to Knowledge

From the findings, the following are the contribution of the research to knowledge;

- i. The study has contributed in deepening the knowledge of using e-procurement in procuring public projects
- ii. The study has increased the understanding on the barriers to the uptake of eprocurement within the FCTA.
- iii. The study has also added to the existing body of knowledge available procurement and e-procurement in construction management within the construction industry.

### **5.4 Area for Further Research**

The study recommends the following further research:

- i. A Similar study that would assess the contribution of e-procurement on construction project performance.
- ii. A study that will develop a framework for managing e-procurement in public infrastructure projects could be embarked upon.

 iii. A study that should compare the viability of e-procurement in private projects could be embarked upon.

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## **APPENDIX A**

### **QUESTIONNAIRE SURVEY**

## IMPLEMENTATION OF E-PROCUREMENT SYSTEM IN PUBLIC BUILDING CONSTRUCTION PROJECTS

## (A CASE OF FEDERAL CAPITAL TERRITORY ADMINISTRATION, ABUJA)

## **SECTION A: GENERAL INFORMATION OF RESPONDENTS**

All responses provided will be treated as confidential for research purposes only.

1	. Name	of	Org	ganisation	L	(Opti	onal)	
2	. Gender:	Male Female	e 🗔					
3	. Profession:	Project managerBu	ilder	Quantity	y Surveyor	Arch	nitect	
	Engineer	Other, please specify						
4	. Years of exp	erience in procurement u	nit of you	r organisa	tion : Less tha	an 5-10		
	11-20	21-30 Above	e 30					
5	. Academic Q	ualification: NDHN	D	] B.Sc/B.'	Tech	M.Sc/M.	Гесh.	
	Others,					р	lease	
	specify							
<u>SEC</u>	TION B: ELE	CTRONIC PROCURE	MENT (E	-PROCU	REMENT).			
<b>Q1</b> . I a five	Please rank you e- point scale in	r level of awareness of e- the following spaces pro	procurem	ent, in the	order of awa	reness base	ed on	
Very	Low	Low Undecid	ded 📃	🗋 High	Ver	y High 🗖		
Q2. /	Awareness of ir	nplementation of e-procu	rement in	your orga	nisation.			
Very	Low	Low Undecid	ded	🗋 High	Ver	y High 🗖		
The system agreed disag	The following are the <i>challenges associated with the current paper-based procurement system in FCTA</i> , please kindly respond by placing a tick to demonstrate your level of agreement with the factors on a scale of 5-1 (5-strongly agree; 4-agree; 3-moderately agree; 2-disagree; and 1-strongly disagree)							
S/N	What are the cha current paper-h	allenges associated with the pased procurement system	5- strongly	4- Agree	3- Moderately	2- Disagree	1- Strongly	
~	in FCTA?	protections System	Agree		Agree		Disagree	
1	Lack of traditiona	al professional procurement						

1	Lack of traditional professional procurement			
	expertise			
2	Absence of open and competitive tendering			
3	Lack of transparency			
4	Poor legal framework and corruption			
5	Inadequate institutional and human resource			
	capacity			
6	Size and complexity of procurement			

7	Political interference by the executives			
8	Shortage of experienced procurement			
	practitioners			
9	Faulty implementation of procurement system			
10	Complexity of procurement regulations			
11	Exclusion of procurement officials from			
	decision making process of tender selection			
12	Incompetency of the procurement			
	practitioners			
13	Procurement entities repulsive attitude			
14	Delay from Bureau of Public Procurement			
	processes			

The following are the *barriers to the uptake of E-procurement in FCTA Abuja*, please kindly respond by placing a tick to demonstrate your level of agreement with the factors on a scale of 5-1 (5-strongly agree; 4-agree; 3-moderately agree; 2-disagree; and 1-strongly disagree).

	Barriers to the uptake of E-procurement in	5-	4-	3-	2-	1-
S/N	FCTA Abuja building projects	strongl y Agree	Agree	Moderately Agree	Disagree	Strongly Disagree
1	Lack of top management support					
2	Inadequate government support					
3	High costs of implementation					
4	Lack of technical expertise					
5	Security of transactions					
6	Lack of common technology standards					
7	Time needed for the implementation process					
8	Resistance to change					
9	Lack of skilled personnel					
10	Complicated and extended procedures					
11	Poor financial base					
12	Lack of confidentiality and flexibility					
13	Fear for loss of jobs and end to corruption					
14	Unreliability of the technology					
15	Reduction in the level of personal contacts					
16	Illegality of e-procurement contact					

17	Poor ICT and internet infrastructure			
18	Unreliable power supply			
19	Lack of national ICT policy			
20	Cost of e-procurement technology			
21	Lack of uniform standard for implementation of e-procurement system			
22	Unavailability of e-procurement			
	applications software and tools			

The following are the *are the prospects of e-procurement implementation in FCTA Abuja* please kindly respond by placing a tick to show your level of agreement with the factors on a scale of 5-1 (5-Very important; 4-important; 3-fairlyimportant; 2-undecided; and 1-Not important).

		5-	4-	3-	2-	1-
S/N	What are the prospects of e-procurement implementation in FCTA Abuja?	Very import ant	important	Fairly Important	Undecide	Not important
1	Transparency and openness of information in public procurement					
2	Transparency in Public accessibility to the information of tender process					
3	Transparency in scope of online vigilance and monitoring					
4	Transparency in secrecy of bidders information					
5	Transparency in real time access of information and bidding					
6	Cost and time savings in advertisement of tender notice					
7	Cost and time savings in preparation of tender documents					
8	Cost and time savings of pre-tender meeting					
9	Cost and time savings intender collection from multiple locations					
10	Cost and time savings in tender Evaluation Report process					
11	Cost and time savings in Sending Tender Evaluation Report to Approving authority for approval					
12	Cost and time savings in issuance of Notification of Award & communicate with renderer					
13	Cost and time savings in Contract agreement					

14	Efficiency in positive change of staff concentration			
15	Efficiency in Reduction of errors			
16	Efficient and flexible Procurement process			
17	Efficiency in cash flow improvement compared to manual system			
18	Guaranteeing of best quality with little price			
19	Improvement of the entire tendering process			
20	Efficient selection criteria of bidders			
21	Good governance in competition among the bidders			
22	Good governance in pre-qualifying			
	process			
23	Good governance in Reduction of			
	collusion among the bidders			
24	Process improvement in workflow			
	management			
25	Process improvement in Managing			
	capacity of large number of bidders			
26	Process improvement in Automatic			
	generation of necessary report			
27	Process improvement in Accuracy of			
	purchase decisions			
28	Process improvement in Automation of			
	procurement process			
29	Process improvement in e-contract			
	management system			

The following are the *challenges of implementing of e-procurement implementation in FCTA Abuja*, please kindly respond by placing a tick to show your level of agreement with the factors on a scale of 5-1 (5-strongly agree; 4-agree; 3-moderately agree; 2-disagree; and 1-strongly disagree).

S/N	What are the challenges of implementing E-procurement by Public FCTA Abuja?	5- strongly Agree	4- Agree	3- Moderately Agree	2- Disagree	1- Strongly Disagree
1	Inadequate financial resources and backing					
2	Lack of competent employee on e- procurement					
3	Inadequate technological infrastructure to implement the process					
4	Inadequate technological infrastructure of tenderers					

5	Insufficient training on procurement and other indirect costs.			
6	Organisation culture, bureaucratic inertia or processes.			
7	Lack of change management, top management support			
8	Internal user resistance to learn multiple procurement systems and procedures.			
9	Training of contractors			
10	Logistic support –Scanner, printer etc.			
11	Awareness Acceptability of new system by all stakeholders			
12	Stakeholders Awareness			
13	Protection against hacker, virus etc			
14	Most information is considered as confidentiality			
15	Lack of interest in e-procurement			

The following are the *strategies for effective implementation of e-procurement in the public sector of the FCTA Abuja*, please kindly respond by placing a tick to show your level of agreement with the factors on a scale of 5-1 (5-strongly agree; 4-agree; 3-moderately agree; 2-disagree; and 1-strongly disagree).

S/N	What are the strategies for effective implementation of e-procurement in the public sector of the FCTA Abuja?	5- strongly Agree	4- Agree	3- Moderately Agree	2- Disagree	1- Strongly Disagree
1	Assessing and documenting the current procurement process.					
2	Assess and document your desired future procurement strategy.					
3	Identify the gaps between where you are now and where you want to be.					
4	Identify the process and system solutions that will be required to bridge the gaps.					
5	Document the important benefits that will come from implementing an e- procurement system (hard, soft and intangible benefits).					
6	Develop key performance indicators (KPIs) to measure success against your identified procurement goals.					

7	Create a business case that addresses the most critical pain points of your buying organization.			
8	Secure executive sponsorship and an internal champion for the initiative.			
9	Develop a plan and commit resources to the project.			
10	Review and select the optimal e- procurement solution provider for your needs.			
11	Create an implementation plan that reduces deployment/maintenance times and resource demands on your IT department.			
L2	Deliver and measure the benefits.			

Thank you very much for your co-operation. Department of Quantity Surveying Federal University of Technology, Minna, Niger State.