IMPACT OF CONTRACTOR SELECTION CRITERIA ON PUBLIC PROJECT DELIVERY IN ABUJA, FEDERAL CAPITAL TERRITORY

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ABSTRACT

There are so many contractors that are not technically and managerially competent. This makes procurement and contractor selection processes an onerous task to be performed by the client. Yet, without a proper and accurate method for selecting the most appropriate contractor, the performance of the project will be affected denying clients value for money. Therefore, the study assessed the Influence of Contractors' Selection Criteria on Public Project Delivery in Abuja using the sequential mixed methods design. The research questions were analysed using thematic analysis, Mean score, Factor analysis, Canonical Correlation analysis and Regression analysis.185 questionnaires were used for the analysis. The outcome revealed that the selective, competitive and negotiated processes were the widely used tendering system; multi-criteria system was prefer over the "price only" for evaluation of tenders; Use of fictitious document by contractors, lack of Pre-qualification of consultants, unrealistic Tender price and undue interference from higher authorities hinders the optimum selection of contractors. It was discovered that Experience, Financial Capability, and Technical Capability are widely considered criteria in the selection process while all the critical success factors for project delivery are very much crucial and that Procurement related factors, Project stakeholders' related factors, and Daily site factors are key parameters to project delivery. The study concluded that there exists a significant relationship between the factors considered in selection of contractors and the criteria success factors. The study concluded that the niche on the inadequate use of the contractor selection criteria in the construction industry in Nigeria will be enhanced by tackling the barriers hindering optimum selection of contractors, diligence evaluation of contractors and the introduction of e-procurement system in the tendering process to minimise the cumbersomeness of the process.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

The construction industry all over the world constitutes one of the most important sectors in the economy of any country. It is well known that the construction industry is a very challenging industry as it is very competitive and unstable during economic down turn (De Valence &Runeson, 2011).Oladinrin*et al.* (2012) noted that construction industry plays an important role in the economy, and therefore vital to the achievement of national socio-economic development goals of providing shelter, infrastructure and employment. Construction activities affect nearly every aspect of the economy and the industry is vital to the continued growth of the economy. Oftentimes, it is perceived to be the enterpriser of its respective economy as it cuts across all aspects of human activities. The Nigerian construction industry is not an exception as its contributions range from enabling the procurement of services to the provision of buildings and other infrastructure, thereby providing employment opportunities to its labour force, while contributing immensely to the Gross Domestic Product (Ikechukwu*et al*., 2017). The industry accounts for 3.05% of the GDP and also provides employment opportunities for over 11 million Nigerians (National Bureau of Statistics, 2016).

However, Oluwakiyesi (2011) stated that the construction industry is complex and requires proficient professionals who are ready to meet the expectations of their clients. Clients in the construction industry could be private individuals including corporate bodies or public organizations which include the government. In Nigeria, the Federal Government is often seen to be involved in the most complex projects with about 38.4% of the market (Ayangade,2009)

thereby contributing significantly to the economic development of the country. Consequently, construction industry is a business arena for both construction and non-construction professionals. This is manifested in the ways construction firms sprang up daily and many who were inexperienced in the business of construction flocked in to make quick money (Ika*etal*., 2012). This implies that there are so many contractors that are not technically and managerially competent. This makes procurement and contractor selection processes an onerous task to perform by the client. Yet, without a proper and accurate method for selecting the most appropriate contractor, the performance of the project will be affected denying the client value for money (Cheng &Heng, 2004).

The procurement system basically comprises five common process elements; project packaging, invitation, pre-qualification, short-listing and bid evaluation (Hatush&Skitmore, 1997). The importance and concern given to procurement methods in the industry are based on two reasons. Firstly, the procurement of construction projects involves a series of processes that are interrelated and sequential. Therefore, effectiveness and efficiency of the processes have considerable impact on the success or failure of projects (Idoro, 2006). Secondly, several procurement methods are available for a developer to adopt in procuring a project and some are more appropriate for a particular project, hence, the project developer sometimes faces major challenge in selecting one method out of many others. Alhazini and McCaffer (2000) maintained that each project has its own characteristics and requirements, and for a project to be successful, the procurement method must address the technical features of the project alongside the clients' and contractors' needs. This reflects a very crucial importance of procurement methods and the contractor selection criteria for the delivery of construction projects.

Consequently, one of the most difficult decisions taken by the clients in the construction industry is in the selection of contractors especially in public project with competitive bidding (Zavadska*et al.,* 2004). This is because construction project is characterized by risks and uncertainty; incompetent contractor increases the chances of time and cost overruns, substandard work, disputes, or even bankruptcy (Hatush, 1996). Thus, one of the ways of ensuring that a contractor is qualify to execute the assigned project in accordance with client and project objectives is to assess the contractor's capabilities at the prequalification stage and tender evaluation stage. Moreover, given the high number of competitors nowadays, successful execution of bidding process is very crucial (Alsaedi*et al*., 2019).

Pre-qualification as a pre-tender process is used to investigate and assess the capabilities of contractors to carry out a contract satisfactorily. The current practice of pre-qualification according to Public Procurement Act (PPA), 2007 of the Federal Republic of Nigeria (FRN, 2007) involves a screening procedure based on a set of selection criteria. Fundamentally, selection criteria are sets of factors considered in the selection of contractor for a project. For pre-qualification to be useful, however, it is necessary to know how these different criteria are likely to affect the main project objectives or Project Success Factors (PSFs) in terms of time, cost and quality. It has been reported in the past that, such knowledge was lacking in public procurement, as most client (and consultant) pre-qualifiers are more concerned with the process rather than with undertaking any serious study of the relationships (Hatush,1996). This may be as a result of the long-term confidence in the pre-selection process, and the fact that final selection is made predominantly on the cost elements of tenders (Ogunsanmi, 2013).

In a related development, Akatsuka (1994) observed that the lack of post-construction evaluation which suggests that owners do not really feel that pre-qualifying contractors is important.

However, with the spate of development, researchers are now interested in these relationships and it had received attention in the field as project delivery on schedule and within budget nowadays is observed to be less than expectation. Thus, Olatunji (2008) also reported that the economic resources often wasted in cost and time overruns, substandard work and shoddy workmanship, client-contractor-practitioner's acrimonious relationships and non-performance of projects as envisaged by clients and end users is huge as a result of the wrong choices of contractors.Okore*et al.* (2017) stated that in the recent past efforts were made towards delivery of projects on schedule and within the budget. Therefore, in order to ensure that, project is completed successfully; the client must select the most appropriate contractor.

1.2 Statement of the Research Problem

The main aim of the 2007 Public Procurement Act is to ensure that quality public projects are delivered on time, within budget, without acrimony (FRN, 2007). However, for a contractor to be able to deliver a project on time, the contractor must be well prepared; technically ready, managerially sound and financially stable. To ensure that such contractor is selected, proper selection and procurement process is required. This involves procurement systems that basically involve pre-qualification and bid evaluation (Mathonsi&Thwala, 2012).

According to Ali (2011), for a project success, a contractor has to be carefully selected based on availability of knowledge, capability and experiences; this ought to be considered before the tendering stage in order to ensure that an appropriate contractor is selected. But studies have shown that, despite pre-qualification exercise and the final selection, most clients are still faced with some challenges as some contractors have been reported to demonstrate incompetency and failed to deliver on scheduled and/or within the budget.

Sidik (2010) asserted that there is no commensurate improvement in construction project success despite all the procurement and contractor selection methods adopted. Eriksson (2013) also discussed the issue further observed that the absence of competent contractors as a result of in adequate selection process is the key factor responsible for weakness of construction performance and need to be urgently investigated. In the same way, the industry has been criticized for its high costs, inefficiency, ineffectiveness, and delays in project due to the procurement process and the selection criteria being adopted (Adesanya, 2014).

It was also observed by Othman (2016) that a large number of projects have been delayed and a lot have failed due to lack of proficiency and inability of the contractors which is as a result of the absence of adequate selection criteria used for the selection of contractors. This is seen as a vital issue in relation to the achievement of construction projects. Delays in project completion time and increase in cost of construction projects are closely related to specifications and contractors' qualification such as financial, technical, experience, contract type, variation between the contractor's bid price and the next lowest bidder's price which have been associated with the capability of the contractor (Omran*et al*., 2012).

Similarly, in Nigeria, large numbers of projects have failed because of lack of competence and ability of the contractors to deliver promptly (Ajayi, 2010). This may have been due to the absence of appropriate selection criteria which allows selection of incompetent contractor. To improve and enhance the operations of the Nigerian construction industry, it is necessary to understand the key factors affecting the construction industry and its associated operations. From the foregoing, it is clear that there are unsatisfactory approaches in both private and public sectors in contractor selection methods which are considered most important factors that impacts on construction project success in Nigeria construction industry. Besides, for public building

projects (with laid down rules in the Public Procurement Act guiding the process of selecting contractors) not to be effectively delivered calls for the following questions; what happens to pre-qualification? Why did selected contractors deemed to have been pre- qualified still show incompetency or fail to deliver project as scheduled? Again, the exercise appears to be a mere one and does not seem to have any impact on adequacy of selection using contractors selection criteria in relation to project success factors.

Considering the foregoing, the research problem observed is based on the fact that, there has been an overwhelming challenge on the use of the best practices for the selection of contractors in the construction sector in Nigeria; therefore this study assessed the influence of contractors' selection criteria on public project delivery in Abuja,Federal Capital Territory (FCT), Nigeria through a deliberate search for answers to the following questions:

i. What is the selection criteria process of contractors for project delivery in the study area?
ii. What are the barriers hindering the optimum selection of contractors for the delivery of building projects in the study area?
iii. What are the factors considered in the selection of contractors for project delivery in the study area?
iv. What are the critical success factors (CSFs) for project delivery in the study area?
v. What is the relationship between the factors considered in the selection of contractors and CSF in project delivery?

1.3 Aim and Objectives of the Study

The study assessed the influence of contractor selection criteria on public building project delivery in Abuja, Federal Capital Territory, Nigeria. However, in order to achieve this aim, the following specific objectives were set to:

i. determine the selection criteria process of contractors for project delivery in the study area;
ii. examine the barriers hindering the optimum selection of contractors for the delivery of building projects in the study area;
iii. assess the factors considered in the selection of contractors for project delivery in the study area.
iv. determine the Critical Success Factors (CSFs) for project delivery in the study area.
v. establish the relationship between the factors considered in the selection of contractors and Critical Success Factors (CSFs) in project delivery.

1.4 Justification for the Study

There are several studies around the world that have been carried out in the area of contractors' selection criteria and its impact on projects delivery. Ghadamsi and Braimah (2012) developed a conceptual framework to assess the influence of procurement methods on project performance; it was established that methods used have strong relationships with project performance outcome (of time, cost, quality), making the selection method the most important decision for every project. Liefers (2012) carried out an exploratory study in Netherlands to investigate the influence of the contractor selection criteria on public infrastructure project success; it was reported that projects that are straightforward are awarded on lowest price but complex projects

that needs to be designed by the contractor adopts the multi-criteria selection method. Similarly, Araújo*et al.* (2015) proposed a model for contractor selection in the Brazilian construction industry; the model proposed considered the interaction between the group decision and an integer programming methods.

Monyane and Emuze (2015) explored the contractor selection process for public sector projects in South Africa; the study showed that the procurement process appeared to be laden with loopholes that are being exploited by tender adjudicators. Sidik (2010) carried out a study to identify the significant factors for contractor selection in Ghana using factor analysis, and also to find the preferred criteria for evaluation and selection of contractors in Ghana; using factor analysis, it was deduced that the variables had common underlying factors which were five, namely: managerial factors, quality and standards factors, resource availability factors, duration and cost factors and location factors. These factors accounted for 59% of the variance of the variables for the multi criteria selection method and were still not adequate, suggesting that the method is inappropriate.

Aje and Ogunsanmi (2012) developed a linear regression model to ease clients burden of selecting contractors using linear regression equation and concluded that experience, tender sum, equipment and workmanship quality are independent variables, hence the most significant criteria for selecting contractors. Doloi (2009) asserted that both researchers and stakeholders from the industry over the time came up with different methods and procedures for selecting contractors: there has been a challenge in creating favourable outcomes for all parties due to inability of the previous studies to link the selection criteria and the project success.

It is obvious from these numerous studies that the subject matter is of a serious concern to the construction industry all over the world; this also reflects a niche on the inadequate use of the

contractor selection criteria in the construction industry in Nigeria as it is obvious that some contractors have failed to meet up with procurement agreement. This study therefore is undertaken to assess the influence of contractor selection criteria on public project delivery in Abuja with a view to improving contract administration. The study is crucial as it will contribute to the knowledge entity, a deliberate and definite approach to an enhanced usage of the selection criteria for contractors in building projects.

The findings of this study will benefit both the industry and the research community. With respect to the industry; clients will be better positioned to understand the details of what is to be considered during pre-qualification and selection in order to optimize and select the best contractors for a project. The knowledge gotten from this work will make clients (especially Federal Government) and consultants to improve on their assessment and selection performance. Also, contractors will gain an increased understanding of the major factors affecting the bidding decision process. Contractors in possession of this information will be better positioned to make more informed bidding decisions, taking into account the most critical factors. This should pave the way to a more efficient and effective bidding process.

1.5 Scope and Limitation

This research work was designed to assess the influence of contractor selection criteria on public building project delivery in Abuja, Federal Capital Territory because of the high concentration of public buildings.This work was limited to only public projects as private projects werenot included, The study was restricted to professionals in the construction industry namely; Architects, Builders, Quantity Surveyors, Contractors and Clients in the public sector that adopts multi-criteria process and those that adopt the lowest bidder process

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1.6 **Definition of Terms**

Procurement: Procurement is defined as the act of obtaining by care or effort, acquiring or bringing out. In building and civil engineering works, it is generally understood to involve all the processes of acquiring, from the design through the construction, financing and sometimes operation until the client acquires what is required (Hibberd*et al*., 1991).

Contractor Evaluation: Contractor evaluation is the process of investigating or measuring project-specific attributes (Faridah, 2007).

Contractor Selection: refers to the process of aggregating the results of evaluation to identify optimum choice (Faridah, 2007).

Bid Evaluation: is used to denote the procedure for strategic assessment to tender bids submitted by contractors (Wahab, 1986).

Open Tendering: A procurement procedure in which any qualified contractor may submit bid at tender (Brynjarsdóttir, 2016).

Closed Tendering: is a procurement procedure in which any qualified contractor may request to participate in the tender and whereby only those invited to tender may participate (Brynjarsdóttir, 2016).

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Historical Development of Procurement in Nigeria

The selection of project procurement system is based on a series of criteria related to the client's consideration, nature and complexity of the project. However, it is important to say that the procurement system is highly directed by economic circumstances (Idoro, 2012). Procurement reforms in Nigeria have been part of the broader public sector reform effort, seeking to improve government effectiveness in service delivery. In 1999, there was a clear understanding by the Government that weaknesses in the existing procurement system were contributing to the issue of corruption (Ekwekwuo, 2016). In the last two decades good number of African Governments have implemented Public procurement Reforms aimed at strengthening their public procurement systems (Familoye*et al.*,2015).They all agreed that these governments have obviously realized that sound public procurement policies and practices are among the essential elements of good governance and that good procurement practices reduce costs and produce timely results whereas poor practices lead to waste, delays and often lead to allegations of corruption and government inefficiency.

Nigeria transited to a democratic government in 1999 under President OlusegunObasanjo after over a decade and a half of military rule. Aboki (2006) stressed the need for change in governance and reiterated that government structures inherited by the new administration naturally had all the traditional drawbacks of military rule, especially with regard to the lack of accountability to the citizenry and general arbitrariness in governance. Specifically, the federal government of Nigeria under President OlusegunObasanjo alerted the nation to the serious and

catastrophic danger that characterized public contract processes (Ezeh, 2013; Udeh, 2015). The administration also emphasized on the World Bank Country Procurement Assessment Report (CPAR) which revealed that Nigeria was losing an money annually due to various abuses associated with public procurement and contract awards.

A major initiative initially designed to respond to this challenge was setting up of Budget Monitoring and Price Intelligent Unit (BMPIU) at the presidency. The BMPIU was a stop-gap due process measure aimed at Public Policy and Administration Research due diligence in government procurements and awards so as to facilitate fair deals for the government through price monitoring. However, the challenge with the Budget Monitoring and Price Intelligence Unit (BMPIU) stop-gap measure include absence of legal framework; inability to reduce corrupt practices as a result of collusion by public officials and the lack of clear role definitions and delineation for proper public procurement practices in line with global best practices so as to adequately ensure transparency, probity, accountability and openness (Eze, 2015)

Several reforms had been initiated on virtually every aspect of public service delivery such as the Due Process Certification Policy in 2002, the National Economic Empowerment and Development Strategy (NEEDS) in 2004, Infrastructure Concession Regulatory Commission Act 2005, whose goal is to regulate, monitor and supervise the contracts on infrastructure or development projects. International development partners and other multilateral agencies have invested valuable time and resources in order to assist in deepening public procurement practices across all the 36 states and 774 local government in line with the federal nature of Nigeria nation. The World Bank through the Civil Society Organizations (CSO) has embarked on advocacy initiatives in order to achieve this objective. State governors were visited while key

local government stakeholders were also encouraged to consider passage of public procurement laws in their respective jurisdiction (Udoma& Bello-Osagie 2012).

Adewole (2014) stated that working to convince the States and Local Governments in order to make them adopt public procurement practices is an herculean task. So much time and resources have been expended with the low response from these two tiers of government. Apart from the fact that there is a low response from concerned states and local governments, there seem to be deliberate efforts by concerned states across Nigeria to whittle down their versions of public procurement laws in order to achieve certain agenda other than good governance in most states that have responded (Adeyeye, 2012). The good news and solution to the menace in procurement process of projects in Nigeria was found in the evolvement of the Public Procurement Act, 2007.

2.1.1 The Public Procurement Act 2007

Until 2007, Nigeria did not have a statute that specifically regulates public procurement. This led to the enactment of the Public Procurement Act (No. 14) of 2007 which requires public institutions and other relevant parties to ensure that all public procurements are conducted in a manner that is transparent, timely and equitable and based on the agreed guidelines, thresholds and standards (Ekanem&Ekefre, 2015).

Udeh (2015) further reported that the public procurement bill was sent to the National Assembly in 2003 and by 4th June 2007, the Public Procurement Act was passed in Nigeria and it became a watershed in Nigeria's attempt at key governance reform. The PPA Act 2007 is designed primarily after the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Public Procurement. The report on Nigeria's procurement assessment identified some weaknesses in the existing procurement system which included lack of appropriate legislation,

shortage of basic skill and inappropriate organisation of the procurement process (World Bank, 2000). The purpose of the PPA Act 2007 is to ensure transparency, competitiveness, value for money and professionalism in the public sector procurement system.

According to Udoma and Bello-Osagie (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 observing 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.

The Nigerian Public Procurement Law 2007 is one of the strategic institutional reform agenda that the country embarked upon in recent years. The public procurement law in is divided into thirteen parts. Each of the parts deals with specific previous structural defect that have plagued the Nigerian public procurement system over time.

Part I (section 1 & 2) of PPA 2007 establishes the National Council on Public Procurement (NCPP) and defines its function. This is to address the problems of the institutional framework, development of policies and the need to ensure that the entire procurement process is in accordance with statutory extant regulation (Udoma& Bello-Osagie, 2012). Some highlighted functions of the council includes- to consider, approve and amend the monetary and prior review thresholds for the application of the provisions of the PPA Act by procuring entities; to consider and approve policies on public procurement; to consider, for approval, the audited accounts of the Bureau of Public Procurement; and to approve changes in the procurement process to adapt to improvements in modern technology (PPA, 2007).

Part II (section 3 – 14) establishes the Bureau of Public Procurement (BPP) as a form of agency to coordinate, harmonize' and benchmark prices in Public Procurement processes (Jacob, 2010). The part also makes it the functions of (BPP) to undertake procurement research and survey, coordinate institutional capacity, acts as supervisory platform, maintain a national database of the particulars and classification and categorization of federal contractors and service providers, prevent fraudulent and unfair procurement and where necessary apply administrative sanctions and provides guideline for regulating Public Procurement practices (PPA, 2007). Essentially, the aim of the first two parts is to establish a strong institutional framework for public procurement.

Part III (Section 15- Scope of Application) of Public Procurement law 2007 deals with the scope of applications. This aspect of the law regards the federal nature of Nigeria as a nation, where states are expected to enact their own laws as they deemed fit, the public procurement act presumptively should cover only federal public procurements (Adewole, 2014).

Part IV (section 16) of public procurement law (Fundamental Principles for Procurements) establishes legal format with regard to thresholds, exigencies of procurement plans, the imperatives of open competitive bidding, and proper definition of the status of contractors/suppliers/service providers in public procurement processes. It also specifies appropriate qualifications for bidders with regards to financial, equipment and technical competence. It provides an alibi for benchmarking on the needs for evidence of taxes pensions and insurance payments; while it gives guidelines for issuance of a certificate of no objection, conferment of responsibility on accounting officer in procurement entity and the conditions for the award of contract (Udoh, 2015).

Part V (sections 17 – 23: Organisation of Procurements) of the Act deals with establishments of procurement planning and the role of procurement planning committee. It identifies the approving authority, procurement planning process, procurement implementation, accounting officer, procurement planning committee, tenders board and prequalification of bidders. This is very significant. Adewole (2014) observed that before now, public procurement has suffered from anticipatory procurement even when procurement entity knows that there is no funding to back up such procurements. By so doing, the author stressed that most Ministries, Departments, and Agencies (MDAs) have suffered undue pile up of debts even when such procurements are not a priority. Projects Procurement planning as required by the new law regime ensure that there is proper procurement planning with regard to availability of funds; and it must be of priority, etc. before such procurement plan can be approved by the statutory committee. It also set criteria for prequalification of bidders(Adewole, 2014).

Part VI (Section 24 - 38: Procurement Methods- Goods and Services) of the law deals with procurement methods which include an invitation to bid, bid opening and bid examination in a manner that ensures and promotes open transparent, competitive bidding exercise (PPA, 2007). The section states clearly that except as may be provided by PPA, 2007, all procurement of goods and works by procuring entities shall be conducted by open competitive bidding. This part went further to direct on invitation to bids, bid security, submission of bids, rejection of bids, bid opening, examination of bids, evaluation of bids, acceptance of bids, records of procurement proceedings among others.

Part VII (section 39-43: Special and Restricted Methods of Procurement) and VIII (Procurement of Consultant Services) of the PPA Act 2007- these aspects are important in view of past experience where public officials hide under special or restricted procurements to perpetuate

corrupt practices (Udoma& Bello-Osagie, 2012). These sections define the new rule of engagement. These methods include two stage tendering, restricted tendering, request for quotations, direct and emergency procurement. For any procuring entity to adopt any of these methods, in line with provisions of section 39-43 of PPA, 2007, there must be an approval from the Bureau of Public Procurement.

The Process of the procurement of Consultant (services) was distinctly covered in part VIII (Section 44-52) of the Act. The process includes but not limited to the following: expression of interest, request for proposals, clarification, submission of the proposal, criteria for evaluation of proposals and selection procedures among others.

Part IX (section 53-54: Procurement Surveillance and Review) deals with procurement surveillance, the reporting and review mechanisms by Bureau of Public Procurement (BPP) which were nonexistence in the old order. The part authorise the Bureau of Public procurement to review and recommend for further investigation by any relevant authority any matter related to the conduct of a procurement proceedings by a procuring entity, or the conclusion or operation of a procurement contract if it considers that a criminal investigation is necessary or desirable to prevent or detect a contravention of PPA, 2007. Section 54 of PPA, 2007 clearly stated the complaint procedure or administrative review by a bidder.

Part X (Section 55-56: Disposal of Public Property) of the PPA Act 2007 focuses on methods and process of disposing of public property and assets. This part elaborates the disposal methods, planning of disposals, and went further to clearly state that all procuring entities must distribute responsibilities for the disposal of public property between the procurement unit and tenders board.

Part XI (section 57: Code of Conduct) of the Public Procurement Law specifies the code of conduct to regulate activities of relevant stakeholders which include Bureau Officials, Tender Board, CSO's, and Procurement Officers etc. The purpose is to make relevant stakeholders responsible and consequently liable in case of any infractions (Adewole, 2014). The conduct of all persons involved with public procurement shall at all times be governed by principles of honesty, accountability, transparency, fairness, and equity. Conflict of interest must be declared by all persons involved in procurement proceedings.

Part XII (Section 58: Offences) of the Public Procurement law 2007 specifies offences for various categories of infraction in public procurement processes. It identifies the offences in public procurement and went further to recommend sanctions for any natural person not being a public official, public official and company or firms that contravene any provision of PPA, 2007.

Part XIII (Section 59-61: Miscellaneous) of the PPA Act emphasised the importance of both the seal of the BPP and the signature of its chairman, Director-General or any other person authorized by the council; it also enumerated basic interpretation for some terms and short titles used in the PPA Act 2007.

The Public Procurement Act 2007 introduced the application of accountability, fairness, competitiveness, cost-effectiveness, professionalism, transparency, value for money and standard for procurement/disposals of public assets (Adebiyi 2012). The Act also seeks to introduce prompt delivery, sustainability of process, quality, better risk management, auditing, strict supervision and benchmarking into the public procurement process. All these conform to governance institutional reforms that ensure appropriate structure in ensuring national growth and development (Diamond, 2005). Nevertheless, the advantage derivable from governance

reform through public procurement law regime is limited only to public procurement practices at the federal level of Nigerian government.

2.1.2 Bid evaluation

Construction bid as a process provides a potential customer with a proposal to build or manage the building of a structure. A bid template, or bid sheet, is the required document on which construction companies present their formal bid in their effort to win a project. It is also the method through which subcontractors pitch their services to general contractors (Rodriguez, 2018). The original function of the competitive bidding arrangement is to ensure that the public receive the full benefit of the free and fair competition between the contractors and public at a considerable price and the knowledge of bidding for construction jobs makes the difference between success and bankruptcy for a construction contractor (Ramos, 2017).

Ramos (2017) further opined that the common proposed methods for bidding on commercial construction jobs are the Design-Build proposal and the Construction Manager at-risk (CM at-risk) proposal. The design-build method combines the architect and contractor as a unified team that presents not only a price to build the project but also the cost of the architectural design. Consequently, the bid contains an all-inclusive price for the cost of design and construction. Under the construction manager at-risk method, the contractor and architect operate separately, but the contractor is involved in the process from the beginning and serves as liaison for the client in dealing with the architect.

Evaluation is used to denote the procedure for the strategic assessment of tender bids submitted by prequalified contractors. The bid evaluation team should be able to conduct assessment and carefully analyse data submitted by contractor. Objective information need to be obtained and

more importantly mechanism for verifying the accuracy of data need to be developed (Herbsman& Ellis, 1992).

Bid evaluation involves similar process as prequalification but occurs at the post tender stage and involved the consideration of the bid amount in addition to the contractor's capacity. Any bid evaluation practice that goes beyond that of selection of lowest bidder is currently largely subjective. More objective methods proposed by Moselhi and Martinelli (1990) supported the multi-attribute utility techniques for combining the bid price and contactor selection criteria. The evaluation of bids by multi-attribute methods can encounter some difficulties when comparing different criteria measured on different scales and various ways have been suggested for combining criteria values into a single scale for the selection of competent contractors.

2.2 Contractors in Nigeria

The construction industry in Nigeria provides the driving force necessary for sustaining economic buoyancy. Contractors are firms, companies or organizations that carry out construction works. They offer their skills and services and accept the challenge of executing the works in exchange for financial reward (Omole 2000). An indigenous contractor in Nigeria is regarded as a person or private organization established under the Nigeria Enterprises Promotion Decree of February 1972, and has no other base than Nigeria and its capital base and ownership is entirely Nigerian (Akintunde,2003). These firms range in size from the self-employed craftsmen known as jobbers who engage mainly in repairs and maintenance of buildings to the very large multi-national or foreign-based construction company. Sadly, the Nigerian indigenous contractor base is largely incompetent, inexperienced and Ogunlana(2010) agreed that for this reason, the Nigerian government still lacks confidence in its construction sector.

These indigenous contractors are characterized by under-capitalization, under capacity utilization, understaffing, and are generally managerially handicapped. Over the years, the poor performance of this category of contractors has been a source of concern particularly when compared with their foreign counterparts (Shittu, 1997). Based on available record of high number of bankruptcies, poor quality work, mismanagement, diversion and embezzlement of project fund, and the general economic depression, the survival and growth of indigenous contractors is under threat particularly in view of inflationary trends, high cost of construction materials, borrowing capital and change in government policy (Babalola&Aladegbaye, 2006). The poor performance of contractors in Nigeria can also be attributed to the corrupt procurement process that has been in the country; hence the need to ensure that competent contractors are selected.

2.2.1 Pre-qualification of contractor

Contractor pre-qualification is a commonly used process for identifying qualified, sound and reliable construction contractor (Banaitienė&Banaitis, 2006). A general prequalification exercise is performed to identify an appropriate contractor from the applicants and to evaluate and score them according to their economic and technical aspects, quality standards, past performance and other criteria. Pre-qualification process examines the key contractor-organizational criteria among a group of contractors desirous to tender (Eddie & Cheng, 2004). Such criteria can be past performance, past experience, and financial stability. Contractors are normally evaluated at this stage. Contractor evaluation is not equivalent to contractor selection. Specifically, contractor evaluation is the process of investigating or measuring project-specific attributes, while contractor selection refers to as the process of aggregating the results of evaluation to identify

optimum choice and in seeking to minimize risk; the pre-qualification procedure is often chosen (Topcu, 2004).

Prequalification is carried out to mitigate risk and failure by employing established minimal capacities to ensure enhanced high performance level in contractors (Patil, 2016). It is also a decision making process that involves a wide range of tangible and intangible criteria which demands much subjective judgment based on the pre-qualifier's experience (Thomas &Skitmore, 1995) hence it is necessary to highlight the importance of prequalification to the various stakeholders in the construction industry.

Lesniak*et al*.(2012) posited that basically two types of prequalification exists; firstly by grouping the most suitable contractor to perform certain projects and eventually a standing list is drawn up. Therefore, only approved contractor can apply for specific project, the second method involves selecting the most appropriate group to apply for a specific project which is based on information supplied by the client to the contractor. Nkata*et al*. (2017) asserted that information used for assessment for prequalification fails into the following categories financial information, technical information, managerial information, experience attributes, safety and health plan and other project fundamental concerns.

The benefits of prequalification to the contractor and clients cannot be overemphasized and study conducted by Omran*et al*. (2012) concurred on the following benefits;

Importance of prequalification to the Public Client

- The prequalification process assists the client to identify and disqualify contractors not financially and technically competent to execute the contract,
- The process allows the client to save time and cost in bid evaluation.

- It helps to reduce to significantly reduce contract default and delay in the execution contracts.
- Prequalification of contractors improves safety performance based on the bidders past experience.

Importance to Contractor

- The process enables the contractor to save cost in preparing bids.
- It reduces competition in bidding process by selecting only contractors for speed project thereby increasing the contractor possibility of winning
- Each contractor capability is easily identified thereby reducing the award of project to incapable contractor.

Consequently, the Public Procurement Act (PPA 2007) mandated the procuring entity to supply a set of prequalification document to each of the contractors which include;

1. Evidence of incorporation of company
2. Professional and technical information
3. Financial capability
4. Plants and equipment
5. Personnel and managerial strength of the firm
6. Legal capacity
7. Turnover and profit
8. Insurance policy
9. Certificate of completed and past projects
10. Evidence of tax clearance for three years
11. Sworn affidavit of disclosure

12. Evidence of registration with Pension Commission
13. Not convicted in any country for any criminal offences relating to fraud or financial impropriety.

2.2.2 Contractors evaluation

Contractor evaluation is often performed by professional in construction industry using accumulated experience and judgement, it is important to examine the contractor system of information before evaluation. Afolayan*et al.* (2018) in a study supported the necessity to obtain criteria ranking which the client takes into consideration when evaluating a contractor's competence. The ultimate goal of the construction industry is to deliver a completed project that serves its intended functions which is achieved by selecting contractors based on specific criteria for effective project delivery.

2.2.3 Selection criteria

Contractor selection is a commonly used procedure for identifying a pool of competitive, competent and capable contractors from which tenders may be sought. It can aid public and private owners in achieving success by ensuring that only qualified contractor are selected to execute the work (Mills, 2011). Cheng and Li (2004) posited that the performance of the project will be highly affected when inappropriate methods are used. Basically, selection criteria are sets of factors or conditions considered in the selection of contractors. They are classified as pre-qualification and project-specific (Alarcon &Mourgues, 2002).

Most times contractor selection is highly underestimated and neglected in construction (Ng & Wan 2005). Single criteria cannot give a full expression of goals purposed by various stakeholders (Zavadskas *et al.,* 2008). Most of the past researchers verify that a "price-only" selection of contractor system is inefficient in choosing the most knowledgeable contractors who

can execute projects profitably with winning results. Selecting the cheapest bid usually leads to delay, cost over-runs and sub-standard quality and sometimes guides the project to the failure with disputes and escalated claims (El Wardani *et al*., 2006).

Contractor selection and tender assessment continues to be an area of importance and interest to decision makers responsible for delivering project outcomes. Occurring early in the project life cycle, it is possibly one of the most serious undertakings performed by clients, the effectiveness of which is directly related to project success and the accomplishment of specified objectives (Watt *et al*., 2010). Client has the sole duty of selecting the appropriate contractor that will complete a project successfully and it involves a procurement system that comprises project packaging, invitation, pre-qualification, short-listing and bid evaluation (Hatush & Skitmore, 1997).

The commonly considered criteria includes tender price, financial capability, past performance, past experience, resources, current workload, past relationship and safety performance. However, the eight criteria are interrelated to a certain extent. Some of these criteria can be affected by one another (Bakhshi&Bioki, 2013).For instance, good past experience may lead to good safety performance if the past experience includes good safety records. Good past performances and experiences are good evidence of successful projects, which in turn results in strong financial capability. Resources and financial capability may be positively correlated. Tender price may be negatively related to other criteria, in most studies of contractor selection, the criteria are assumed to be independent of each other. Some of the criteria are appraised thus;

(a) Tender price:

The tender price of a contract is an important consideration and majority of contractors working on projects are selected purely on basis of having put forward the lowest tender

price. However, researchers have increasingly observed that the practice of awarding tenders on a basis of lowest price often leads to quality problems (Puri&Twari, 2014). The construction industry is majorly price based and increasing price pressure impacts on performance, levels of risk, and value (Kumaraswamy, 2006). Construction clients are becoming more enlightened that selection of a contractor based on tender price alone is quite risky and may lead to the failure of the project in terms of time delay and poor quality standards (Singh &Tiong, 2005). The tender price has been a significant factor influencing the process of the tendering procedure and the choice of the contractor in recent time. Low tender prices should not attract the client, rather they should behave cautiously otherwise the decisions that are made based on the lowest price could cause greater losses in terms of the other goals, such as quality and time (Kog&Yaman, 2014).

(b) Financial capability

Financial soundness of a contractor connotes the financial status and resources that are available to meet the demands, performance standards and costs. Ibidun (2010) discussed the issue further noting that inadequate attention to cash flow forecasting causes the construction industry to be the largest sector of the economy experiencing bankruptcy hence, cash flow forecasting and controlling are germane to project survival.

Financial capability of a contractor which relates to bank status gives an indication of the financial management abilities and relationship with banks in case of insolvency (Aje, 2012) and further asserted that information, statement of the contractor's financial condition and resources, including the current and fixed assets, annual turnover, liquidities, credit ratings, banking arrangement, bonding and audited financial statement

by a certified public accountant will be ultimately required and evaluated before the contractor is selected.

(c) Current workload

The competence of a contractor can be determined based on the available resources, track record, and current workload. The workload parameter disqualifies those contractors who are overloaded and qualifies others genuinely depending on the contractor's pre-qualification ratings (Nerija&Audrius, 2006). Further work by Al-Otaibi (2011) discovered the need to identify current workload and capability of the contractor in order to determine the level of commitment to project and to ensure that the proposed project does not represent more than the maximum workload capacity for the contractor as these impacts much on the project success.

(d) **Past experience on similar work**

Contractor experience entails the type of project completed in respect to location, nature, size, scope, local and national experience to determine whether or not the contractor had handled similar nature and scope (Varun *et al*., 2012). The general capability of a contractor should be related to the availability of relevant recent and past experiences; and the value of work undertaken should be stipulated as annual value of the general contractor's work carried out over a stated period of years (Ajayi, 2010). The basic ability of a contractor is evaluated on the basis of experience, shows the maximum amount of a construction project contract for the same main area of construction work that a contractor can perform in the future. Mangitung (2005) also agreed that proper emphasises on past experience and contractor capacity of increasing the volume of work

from the time of establishment of firm and geographical area of operation are perceived as having impact on project success.

(e) Health and safety

Attalia*et al.* (2003) defined health and safety as the degree to which the general conditions promote the completion of projects without major accidents or injuries which occurs during construction stages. The construction industry has long been known to lag behind other industries in terms of health and safety. It has the highest rates of accidents among all the industries (Choudhory*et al*., 2008).

Alzahrani and Emsley (2013) reported that machinery hazards, transient work force, harsh operative environment and strenuous physical task contributes to poor safety performance in the construction industry hence variable hazards and poor safety records have a huge impact on the work environment and employees' morale, and in some cases a poor safety record might result in the job stopping on site. Aksom and Hadikusumo (2008) also confirmed that good safety records are achieved when a company adopts effective safety inspection and to certify functional safety records; contractor are required to provide a detailed, functional health and safety plan for the contract.

(f) Past performance and quality

Past performance connotes the measure of similar work done satisfactorily by a contractor in the past resulting in a higher or lower degree of confidence in contractor in relation to time, cost and quality (Afolayan*et al.*, 2018). According to Holt *(*1994), contractors with records of successfully completed projects are more likely to achieve

targets in future while predictive performance of contractors can be determined by investigating contractors' performance. High priority should be given to contractor performance since delays in construction project have significant cost and quality implication. Contractors of high repute and better past performances will improve client confidence and raise the possibilities of future projects (Alzahrani&Emsly, 2012).The evidence of past performance must be accompanied with copies of letter of awards and certificate of practical completion on similar jobs executed in the last five years. Commendation letters from previous client may be added advantage and not pictures only (Olatunji, 2008).

Gransberg and Riemar (2009) also reiterated that past performance, quality and the ability of the contractor on the upcoming projects depends on the work classification, suggesting that contractors should complete a checklist of classes of construction or to list the type of major projects completed within a given number of years.

(g) Managerial and technical capability

Varun*et al.* (2011) suggested that understanding technical knowledge enable the use of correct working method to completely handle projects and for contractors to successfully deliver projects there is need to provide qualified and skilled Personnel that possesses project management responsibilities and execution capacities during construction. The information required includes management organisation, experience of technical personnel (skilled and unskilled), availability of owned construction equipment, ability to control and organise contract and efficiently integrate labour resource (Sidik, 2010).

Watt *et al.* (2009) also investigated various factors to identifying key factors in the evaluation of tenders for projects and established that organisation expertise, workload capacity, physical resources, company reputation, technical expertise and solutions are the most significant factors in evaluation of tenders.

2.2.4 Methods used in selecting contractors

Various studies on the contractor selection had been carried out by several researchers, as a result, several methods of analysing the contract documents for prequalification emerged (Kog&Yaman, 2014).These are methods attempting to estimate the values of contractors at prequalification stage by using various selection criteria (Jaselskis& Russell, 1992).

The single criteria evaluate contractors through bid price. Sequel to prequalification, tenders that meets the minimum tender requirements and has the lowest bid is awarded the contract. However, the lowest price concept has challenges (Nerija&Audrius 2006). The multi-criteria and attributes selection is based upon several multiple criteria and attribute. Evaluation based on multi criteria is dependent on nature of project and subjective judgement of the professional assessor. Several multi criteria methods include multi-criteria decision-making (MCDM), multi-attribute analysis (MAA), multi-attribute utility theory (MAUT), multiple regression (MR), cluster analysis (CA), bespoke approaches (BA), fuzzy set theory (FST) and multi-variate discriminant analysis (MDA) (Mahdi *et al*., 2006).

MCDM aims at using a set of criteria for a decision problem. Since these criteria may vary in the degree of importance, the analytic hierarchy process (AHP) technique is employed to prioritize the selection criteria (assign weights to the criteria). In the existing literature of contractor

selection, studies have utilized AHP to set up a hierarchical skeleton within which multi-attribute decision problems can be structured.

The MAA, MAUT and AHP are comparable methods that assign weights to selection criteria (Alarcon &Mourgues 2002). Consequently, no generalized sets of rules for the evaluation process and the importance of non-price factors is well recognized (Zavadskas*et al*., 2008). Contractor evaluation has been recognized as a particularly complex task due to its ambiguity and difficult formalization. It is usually based on intuition and past experience and carried out by the general contractor management (Luu&Sher, 2006).

2.3 Project Success Factors (PSFs)

Procurement experts have goals or concerns that can be described in similar terms. These goals all contribute in different degrees to the predominant project success factors of cost, time and quality.

2.3.1 Cost of project

Cost is among the three most considered factors throughout the management of a project life cycle and can be regarded as one of the major critical factors analysed in the choice of contractor. It is considered as the most important parameters of a project and the driving force of project success. Despite its proven importance and initial consideration, it is not uncommon to see a construction project failing to achieve its objectives within the specified cost (Okore*et al*., 2017). Cost overrun is a very frequent phenomenon and is almost associated with nearly all projects in the construction industry. This trend is more severe in developing countries where these overruns sometimes exceed 100% of the anticipated cost of the project.

2.3.2 **Time /duration of the project**

The time to complete the project is usually scheduled to enable the client use the building at a date determined in future. Clients vary in their willingness to employ only those contractors who are able to meet target dates become the number one factor to consider in the selection of the contractor (Topcu, 2004). Past research by Aje&Ogunsanmi (2012) revealed that Project completion within the stipulated time is one of the primary objectives of construction projects and usually one of the terms of agreement between client and the contractor and further asserted that failure to achieve construction projects on time was attributed to project characteristic, procurement methods, project team performance, client reputation characteristics, design team characteristics and external conditions hence high degree of importance is allocated to time.

2.3.3 **Quality of the project**

Contractors are expected to build according to specifications. Central to success is the factor of quality, whereby the availability of required technology and expertise, technical background of contractor's personnel, and communication skills is crucial in the selection of contractors (Memon *et al.,* 2012).Quality in construction projects encompasses not only the quality of products and equipment used in the construction, but the total management approach to completing the facility per the scope of works to customer/owner satisfaction within the budget and in accordance with the specified schedule to meet the owner's defined purpose (Haung,2014).

According to Rumane (2011), the nature of the contracts between the parties plays a dominant part in the quality system required from the project and the responsibility for fulfilling them must therefore be specified in the project documents. Minimum standards are contained in the

specification documents and these documents include plans, specifications, schedules, bill of quantities and other relevant documents. Quality is one of the critical factors in the success of construction projects and can be regarded as the fulfilment of expectations and satisfaction of the project participants and the construction industry has been struggling with quality issues for many years (Ashokkumar, 2014). In order to have a holistic look at the challenges of public building delivery, the place of the contractors that are selected to do the job in the industry must be considered especially in the Nigerian construction industry.

2.4 Public building delivery

There has being purposeful attempts to do away with challenges precluding project delivery in Nigeria. This was reported by Okore*et al*.(2017) that efforts are geared towards delivering projects as scheduled and within the budget. However, projects delivered are accomplished with delays and cost that are far above the budgeted cost. Unlike other industries, the uncertainties are inherent in construction. Hence, there is need to consider the cause for time overrun, cost overrun, and the needed quality of projects carried out by selected contractors.

2.4.1 Causes of cost overrun in building projects

It is evident from the findings that both internal and external aspects of business setting are present as the prime contributors to cost overruns. The top ten cost overrun factors found were: fluctuation in prices of materials, high cost of machineries, lowest bidding procurement policy, poor project management/ poor cost control, delays between design and procurement phases, incorrect/ inappropriate methods of cost estimation, additional work, improper planning (Mansfield&Doran, 2013). Basically, the causes of cost overruns and delays in public construction projects were found to be: change of work scope; delayed payments; poor

monitoring and control; high cost of capital; political instability/insecurity (Ikechukwu*et al.*, 2017*).*

Ikechukwu*et al.*(2017) found out that a lot of factors are responsible for cost overrun in project delivery and came out with the following recommendations;

- Bureau of Public Procurement (BPP) should discourage the use of traditional procurement method as the sole procurement method, as that is more prone to cost overruns.
- Contract award should not be based on lowest bid as there are a lot of accompany risk.
- The Government should not adopt Design and Build (DB) delivery method in public project procurement.
- The project owner (or project manager) must ensure the completion of all design, documentation with all associated value engineering analysis and build ability reports before tendering, so that design changes during project execution would be minimized.

The study also reported that changes in work scope by client and low price bidding by contractors top the list of major causes of cost overruns in Nigeria and that the rate of project cost overruns was 45.56% and also concluded that the client and the contractors are more prone to risk in Design Bid-Build (DBB) delivery method than the Construction Manager at Risk (CMR) delivery methods.

Conclusively, for prompt project delivery, it was recommended that government should discourage the use of Design-Bid-Build as the main official procurement method, and the need to

adopt other viable alternative procurement methods that will protect the client from cost overrun tendencies.

2.4.2 Causes of delay in building projects

Delays are costly and often affect the feasibility for the project owners and progress of the construction industry. In a study by Assaf and Al-Hejji (2006), the causes of delay were identified by field survey involving the participation of three parties. The common causes of delay that arose from all parties were: change order by the owners during construction, delay in progress payment, ineffective planning and scheduling, shortage of labour, difficulties in financing on the part of the contractor. Fugar and Agyakwah-Baah (2010) reiterated the top ten factors that causes delay in construction are delay in honouring valuation certificates, underestimation of the costs, underestimation of the complexity, difficulty in accessing bank credit, Poor supervision, underestimation of time factor, lack of completion of projects by contractors, shortage of materials, poor professional management, rising cost of materials and poor site management and further studies showed that the financing group was the most influential factor causing delay; scheduling and controlling were considered as second most important factor.

Considering the foregoing and the study objectives, there is a need to carry out a review of studies that has been done on the objectives. The objectives are the process of contractor selection, the barriers hindering the optimum selection of contractors, the factors considered in the selection of contractors, and the critical success factors (CSF's) for project delivery.

2.5 The Process of Selection of Contractors

The most frequently used tendering procedures in selecting contractors are the open and the selective procedure and in the case of a public procedure, any bidder is allowed to tender for the project (Liefer, 2012). This procedure is the most direct and simple. The restricted procedure is characterized by two clearly separated phases: First phase is selecting the organizations that have registered. The second phase is the evaluation of the bids. This procedure is also known as tendering with pre-qualification. The main method is to award contracts to contractors with the lowest price as single criterion and without considering or use the Multi Criteria Selection (MCS). Although, many authors believe that this procurement method is one of the major causes of project delivery problems (Ojo, 2009). However, when an adequate process of pre-qualification is carried out, most of the delivery problems in projects will be handled and the right contractor selected.

A summary of a study by Weele (2008) gave the different processes and procedures used in the selection of contractors: Open, Closed, Restrictive, Negotiated, Serial, Single Stage / Two stages tendering procedures.

(a) Open tendering

The open tendering system gives opportunity to all contractors. Ashworth (2008) explained it as a method that permits the participation of contractors who are unable to meet up with the essential criteria in the submission of tender. Inappropriate contractors are removed from the list if the number of tenders becomes too large. The process of open tendering allows contractors to give in their tenders for a project. The client describes the project briefly and then extends invitation to suitable candidates to apply for the project (Bennett, 2003).

When the general announcement of this tender is made, the selection and bid documents are submitted simultaneously prior to the presentation date. The bidders will be assessed using the selection criteria and the bid with the award criteria. Liefers (2012) outlined the advantages of this method as possessing the relative short turnaround and less documentation because of the bundling of selection and award. The disadvantages of the open procedure are the risk of a big amount of bids and lot of time to judge the bids.

(b) Closed tendering

The closed tendering is usually referred to as the traditional system and is still the most popular technique of awarding construction contracts. Under this method, the number of companies is usually limited and only a number of selected companies with a good reputation are invited by the project team out of the companies who may tender for the work (Ashworth, 2008). The invitation to tender is issued only to a pre-determined list of organisations. The benefits of the restricted procedure as given by Weele (2008) are that the transaction costs are lessened by limiting the number of bidders and it aids the contracting authority in ensuring that only qualified contractors can put together and submit a bid. However, the shortcomings of this process are the relative long turnaround and the increased risk of objections by the contractors (Watt *et al.*, 2010).

(c) Negotiated tendering

The negotiated tendering procedure is another process that is permitted under certain circumstances. Negotiation permits early contractors involvement and consequent opportunity for overlap of design and construction, closer integration of construction method design and resultant savings in overall time (Arrowsmith,2007).Negotiated procedure without announcement is used only in cases where there is urgency due to disasters; where there is no

apposite bidding or due to technical or exclusive skills needed to complete the works, or even in a case where the task can only be executed by a particular contractor.

The client desire for negotiated tendering may be on the basis of business relationship, ideology affinity, loyalty to the locality, contractor financed project and project financing. The negotiated tendering also allows the contractor to render useful information to the design team during the development of the design and encourages an early start on the project and it encourages high contract prices and against public accountability(Khairy,2010).

(d) Selective tendering

Selective tendering remains one of the arms of competitive tendering and used in the vast majority of public works procurement aims at satisfying the client with best offer by eradicating unnecessary waste of time. effort and reduces aggregate cost of tendering and also measures that only competent contractors are obliged to tender leading to only accepting the lowest tender, however this form is usually less competitive resulting in higher bid, provides platform for collusion between the contractors and often experience high risk(Watt *et al.*, 2010)

The above process above require invitation to tender, submission, examination, assessment and selection The need for a proper evaluation and assessment of bids submitted by contractors, by tender units or sections of organisations cannot be overemphasized. The measure of the outcome for an optimum contractor depends largely on the measure of evaluation carried out.

2.6 The Barriers Hindering the Optimum Selection of Contractors

Olatunji (2008) in a study carried out on the selection of contractors for public projects between 2002 and 2008 in Nigeria discussed the challenges that affect the selection of contractors while considering due process for delivery of projects and observed the following barriers;

- Lack of proper presentation by contractors as majority of contractors due to presentation problems fail to have impressive scores during assessments, despite their excellent performance records.
- Lack of updated company profiles, information required for prequalification and the vulnerability of paper based prequalification,
- Public contracts are procured within a valid annual budget hence most decisions in the construction process must be made within a year. This affects the extent to which the consultants have adequate time and resources to confirm the state of some of the claims of the contractors.
- Cartel formation in public contracts as connivance is found amongst contractors which weakens the competition process.
- Misinformation of assessors on the technical capacities of contractors as most times prefabricated list and credentials are presented.
- Inability of the assessor to separate a contractor's liabilities from credit base from the bank statements presented, the assessors may also be misdirected on the credit worthiness of the contractor may not reflect the contractor's intended commitment and capacity to complete the project.
- Project characteristics, project documentation, availability of resources, political and economic situation are also identified as barriers hindering optimum selection of contractor (Nkata*et al*., 2019).
- This is also in line with the submissions of Latham(1994) which argued that the problems with the construction industry are not restricted to contractors alone, most times consultants to projects are not prequalified, hence validation and physical assessment of

records regarding their capacities as claimed are not verified which leads to an ineffective process in the selection of contractors.

Consequently, the optimum selection of contractors is also hindered due to the absence of objective universal assessment criteria in the construction industry (Hatush&Skitmore, 1997). This challenge has appreciably affected procurement processes and there is still ambiguity as to the level of professionalism a contracting firm should possess which also poses challenge as many firms lack fully registered professionals like Architects, Quantity Surveyors and Builders.

2.7 The Factors Considered in the Selection of Contractors

There had been considerable research on contractor selection criteria. However, there is still a lack of generic selection criteria that can be adopted as a tool in the selection process. There are several factors that need to be considered in this selection process (Patil, 2016). Similarly, AlinaitweandAyesiga (2013) contributed that the selection criteria factors should include the contractor's organisation, financial considerations, management resources, past experience, past performance, and project specific attribute.

Hatush and Skitmore (1997) in a study investigated the criteria used by owners and their representatives for selecting bidders and contractors within the UK competitive tendering system. A series of interviews were conducted with eight different public client representatives and one private client representative with extensive experience in prequalification and bid evaluation processes in the North West of England. The result of the study indicated that the main criteria currently in use comprised Existing workload, followed by Quality assurance in accordance with BS 5750 for Design and Construction, Workload on site, Experience of working on projects of a similar nature, Experience of working with the owner. However, the Public

owners were quite different in this respect to private owners whose criteria are financial stability, local knowledge and responsible attitude towards the work.

Al-otaibi (2011) carried out a study to analyse and evaluate current techniques for monitoring contractor performance, and identify the most appropriate techniques that could be adopted in the Kingdom of South Africa. The literature survey explored several factors that may be beneficial, and can be adopted to evaluate Saudi contractor performance. These factors identified in the literature include financial capacity, technical ability, reputation and management capability. The proposed model for the evaluation of contractors in KSA indicated that culture factor, completion time, and health and safety are the main criteria. The study asserted that culture factor is vital to the evaluation and measurement of contractor performance.

Huang (2011) in a study assessed the criteria for construction contractor selection. The author reiterated that the goal of construction is to deliver a completed project that serves the intended function. Anything in the construction process that does not contribute to this goal is a potential obstacle and adds unnecessary risk to the project. Some clients may choose to use just one of the criteria used to qualify a contractor to the stage of tendering procedure and it is usually the contractor's experience. Majority of the studied clients evaluate contractor companies after having completed construction works. This proves that great attention is given to reliability and competence of the contractors.

In another study by Rashvand*et al.* (2015)it was observed that financial standing was considered as the important criteria during the prequalification process followed by technical ability and management capability with 97%, 94% and 85% important index respectively. Contractor reputation and health and safety performance were ranked lowest. Alptekin and Alptekin (2017)

performed an analysis of the criteria influencing contractor selection using TOPSIS method in Turkey. It was found that termination of construction work in previous tenders is the most important criterion of the 12 determined criteria, and the lowest bid criterion was ranked in rank 5.

Jiya (2012) established that among the major contractors' prequalification criteria of building construction projects; the Technical capacity of the contractor was the most important criteria with a mean score of 4.58, and over 58% of the professionals and technical staff. The remaining criteria as considered important are in the following sequence; financial capacity, organization reputation, management and health and safety. None of the criteria scored below 4 except health and safety which means, that all the criteria were important to the public organizations.

Brynjarsdóttir (2016) studied to understand the contractor selection methods applied by Icelandic organisations, compared them to those recommended by experts, and concluded that the methods posed high risk for organisations. It came up with results that the Icelandic organisations use multiple criteria selection to some extent but price is the most important criteria. The criteria most frequently used are professional knowledge, experience of a similar project, other criteria, such as financial stability of contractors, health & safety policy, and whether they work in accordance with a certified quality management system - have a much lower weigh in the selection process. These results indicate that the methods used are somewhat lacking and that there is ample room for improvement in order to minimize risk.

A study carried out in Libya by Othman (2016) on the framework for improvement of contractor selection procedures on major construction projects, revealed that a significant proportion of the respondents in both the public and private sectors were in agreement that the most general

information usually obtained from a contractor could be divided in to three groups. The first group, chosen between 80-90% of the respondents, was experience and financial stability. The second group, chosen between 10-25% of respondents was reputation, technical and management, and health and safety record. The third group, chosen by respondents was cultural experience and the need to critically consider the most important factor and it was concluded that it is important for the client to have a set of pre-determined and object criteria for the selection of contractors.

2.8 The Critical Success Factors (CSFs) for Project Delivery

Tan and Ghazali (2011) defined critical success factor as characteristics, condition or variables that can have tremendous impact on the success of a project when sustained and managed appropriately. Invariably, they are those factors in which success is necessary in order for each of the major project participant in a project to have minimum chance of achieving goals.

Clear links between a project and an organization's key strategic priorities are that, projects need to reflect and address the sponsoring organization's objectives. It should be possible to demonstrate how each project supports those objectives and priorities which provide the greatest return (Dolan, 2010). This will help to prevent a situation where the project is adjudged successful because the project had achieved its schedule, cost and quality expectations, but invariably the product fails miserably to deliver its expected services.Some of these factors are identified as;

2.8.1 Project management factors

Some variables related to project management contributes a lot in the success of public sector construction projects, notably amongst them are a strong monitoring and evaluation system

(Ogwueleka, 2011), effectiveness of coordination and integration of project activities (Ejaz*et al.*, 2013), effective communication management, effective project scheduling and budgeting, adequate team selection, training, development and motivation, project manager's competence and decision making skills (Saqib, *et al*., 2008)

2.8.2 Adequate planning factors

According to Haughey (2014), this is a critical factor for success because it provides the following benefits; Clearly documented project milestones and deliverables; valid and realistic timescale; allows accurate cost estimates to be produced; detailed resource requirements; acts as an early warning signal, providing visibility of task slippage; and keeps the project team focused, while keeping vigil with the progress of the project. Akpan and Igwe (2001) concurred that inadequate planning and political reasons is the bane of successful delivery of public sector projects in Nigeria.

2.8.3 Procurement related factors

Tan and Ghazali (2011) opined that three (3) attributes were used to measure procurement related factors, these attributes are the procurement method (selection of the organization for the design and construction of the project), tendering method (procedures adopted for the selection of the project team and in particular the main contractor) and contracting mechanism (type of contract).

2.8.4 External Factors

Factors external to the project itself can affect the success of construction projects as stated by different authors (Chua *et al*., 1999). The attributes used in measuring this factor are economic

environment (Amade*et al*., 2012), social, political and physical environments, administrative approvals, sufficient funding, technology, skill availability and commitment of all parties involved (Alvani*et al.,* 2014). More specifically, *Omran et al.* (2012) opined that the external factors that should be taken into account during any construction project activity are inclement weather condition, an act of God (force majeure) and price fluctuation amongst others. (Adnan *et al.,* 2014) quoted political instability as the external factor mostly militating against the success of public sector construction projects in Nigeria.

2.8.5 Unrealistic estimates of schedule and cost

Project management success is measured against traditional measures of performance against schedule, cost and quality (Alvani*et al*., 2014). It follows that inaccurate estimate of schedule and cost will translate to poor schedule and budget performance. This assertion is in consonance with Nasir and Sahibuddin (2011) findings which stated that lack of realistic estimate of schedule and budget is one of the most contributing factors to the failure of most projects. Omajeh (2014) also opined that public sector construction projects in Nigeria are prone to cost estimation inaccuracies than private sector projects, which is obvious on the state of poor performance and outright failure of public projects in the country.

2.8.6 Project stakeholders related factors

Effective stakeholder management had been reported as key to construction success (Yong &Mustaffa, 2012) The importance of effectively engaging project stakeholders is emphasised in Dolan (2010) findings that commitment level of stakeholders determines response to project obstacles and dealing with problems as they arise while adequately capturing all stakeholders' requirements and translating them into the project, will lead to satisfaction and ultimately successful project delivery. Other factors believed to be critical to the successful delivery of

public sector construction projects are as opined by different authors include contractor's ability to manage the design, provision of adequate finance by the client and leadership skills of the project management (Ika*et al*., 2012)

2.8.7 The influence of contractor selection criteria on project delivery

It has become crucial to have a closer look on the existingpractices in awarding construction contracts to contractors and achieving success through project delivery in the construction industry Though manyresearchers and industry practitioners have come up with different methods and procedures forcontractor selection, most of them have limitations in establishing a relationship between the selection criteriaand the project delivery which ought to lead to a win-win situation for all parties (Singh &Tiong, 2006;Wong*et al.*, 2008).

Hatush and Skitmore (1997) assessed the perceived relationship between 20 contractor selectioncriteria under three main project success categoriesin terms of time, cost and quality. Anextended interview questionnaire approach was adopted and a total ofeight construction industry experts were interviewed inthe project. Theexpected meanandvariancevalues ofeach criterion in terms of time, cost and qualityimpacts were analysed and 90%, 95% and 99% confidenceintervals were calculated. Past failures werereported to be the single most critical factor across allthree project success categories; while managementsafety accountability was identified as the leastcontributing factor in contractor selection with regards to their influence on the three success measures. Though the study represented an important first step towards measuring the impacts of all selected criteria on project success factors, non-identificationof the critical attributes influencing time,cost and quality success made the expediency of theresearch incomplete.

A more elaborate study was carried out by Doloi (2009) to assess the influence of contractor selection criteria on project delivery. The relative significance and impacts of the attributeswere determined using a structured questionnaire survey in selected construction projects. After the factor analysis was done, a total of seven factors significant to contractors' performance were extracted,specifically: soundness of business and workforce; planning and control; quality management; pastperformance; risk management; organizational capability; and commitment and dedication.The derived multiple linear regression models revealed that technical expertise, past success, time in business, work methodsand working capital had significant impact on contractors' performance in relation to time, cost and quality success.

2.9 Gaps in Knowledge

This study has reviewed the selection criteria process, barriers hindering the selection, the factors used in the selection of contractors, and the critical success factors (CSFs) for project delivery. The study has been able to give a good exposure on the present situation surrounding the area of contractor selection criteria and project delivery; but notwithstanding, some identified gaps requires further improvement.

1. It was obvious that past studies on the selection process of contractors in the study area were not substantial enough to ascertain the major issues discussed, especially on the criteria for evaluation and selection of contractors. This prompts the need for this study in the Nigerian construction industry.
2. It was also seen that few studies focused on the barriers or challenges that hinders the optimum selection of contractors in the study area; this is a crucial area that needs to be tackled in order to foster improved delivery of projects, hence the need for the study.

3. From the review on the factors used in the selection of contractors, it was seen that only a few studies had been conducted in the study area which shows that there is need to reemphasize on the suitable factors that will aid in the optimum selection of contractors for projects delivery.

Based on these findings by various researchers therefore this study seeks to contribute to the body of knowledge in these areas which triggers the study by assessing the influence of contractor selection criteria on public building project delivery in Abuja, Federal Capital Territory.

2.10 Related Literature

It is of no doubt that the criteria for the selection of contractors has good influence on the delivery of building projects. Cristóbal (2012) points out that contractor selection plays a vital role in the project performance. Appointing the suitable contractor for the right project is the most crucial challenge for any decision maker. The critical sources of delay are due to the fact that the project contractor does not have enough working capital, late advance payment, poor planning, poor site management and inadequate contractor experience (Tawil*et al.,* 2013). The selection of the contractor is one of the most significant issues affecting the success of a construction project and it is one of the most challenging decision-making aspects of a construction project (Kog&Yaman, 2014). It therefore means that to attain the best outcome in the cost, time and quality triangle for construction project management, there isthe need to encourage the adequate use of the criteria for contractors' selection in building projects. A number of related literatures are highlighted in the table below;

Table 2.1: Related Literature

Author	Year	Place	Research Methodology Adopted	Summary of Findings
Hatush	1996	UK	Mixed method Methodology	The study provides a means using the PERT methodology to incorporate uncertainty and/or imprecision associated with the assessment of contractors' data; in terms of the ultimate project success factors of time, cost and quality. The utility technique proposed should help clients in selecting contractors and the contractors themselves for selecting sub-contractors in offering a means of broadening their analysis of tenderers beyond that of simply relying on tender values. It also alerts contractors to the importance of increasingtheir ability to satisfy the needs of the clients in terms of their ultimate project goals
Hatush&Skitmore	1997	UK	Interview Analysis	The insufficiency and inappropriateness of the awarded contractor has led to sub-standard work, delays, disputes, or even bankruptcy. If a client wishes to cope with these new developments and invite acceptable bidders, it is necessary to clarify and develop pre-determined selection criteria and the objective of the prequalification and bid evaluation processes. The study described the criteria being used currently in the prequalification process and bid evaluation by the public clients. The authors also recommended that some criteria be stressed and considered more carefully during the prequalification process.
Eddie *et al.*	2004	Hong Kong	Review Model Dev't	The multi-criteria decision making (MCDM) is suggested to be a viable method for contractor selection. The analytic hierarchy process (AHP) has been used as a tool for MCDM. However, AHP can only be employed in hierarchical decision models. For complicated decision problems, the analytic network process (ANP) is highly recommended since ANP allows

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				interdependent influences specified in the model.
Banaitiene&Banaitis	2006	Lithuania	Mixed Methods	Both in Lithuania and abroad, the bid price of construction works is the main criterion for evaluation of contractors. The lowest price often cannot guarantee commitments on quality and duration of a construction project. Therefore, when selecting a contractor, a client must not only compare bid prices but also set other criteria for evaluation of qualification and determine their weight. Only on the basis of quantitative and qualitative evaluation criteria and by comparing bids of contractors it is possible to select a qualified, competent and reliable contractor, to evaluate its qualification, economic and financial condition and technical capability and skills and to achieve relevant results in a construction project.
Waara&Brochner	2006	Sweden	Document Study	Price formulas, translating bid prices into scale values, were found to be based on the lowest bid, bid spread, or average bid. Non-price criteria were evaluated on either relative or absolute merits. Owners should be aware of the incentives that their selection practices create and view this in a policy perspective, whereas contractors should be ready to assess the short and long term values of non-price features.
Sari & El-Sayegh	2007	UAE	Literature Review	The study presented the selection factors for the appropriate CM@R company. Construction Management at Risk selection factors can be used by owners to evaluate different CM@R proposals. The factors are divided into three groups: general factors, construction management factors and general contracting factors. Each of these groups is divided into categories and each category is divided further into

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				attributes (selection factors). The study also proposed a framework that assists owners in selecting the appropriate construction management at risk contractor.
Kadefors*et al.*	2007	Sweden	Literature Review	The collaboration content led to a focus on assessing attitudes and teamwork potential of individuals, but past performance information was downplayed. It is concluded that tools and procurement advice for relationship contracting should have a development focus and be designed to involve local competence on both sides. Also, procurement in this context should involve a conscious effort to inspire change and commitment among potential bidders.
Zavadskas*et al.*	2008	Lithuania	Literature Review	The application of the model offered in the study may reduce the risk involved in the selection of a contractor and can lead to the elimination of unqualified contractors during the bidding process. The selection of contractor can be with different risk level. Hodges-Lehmann rule allows stakeholders to select contractor taking into account different risk levels. Knowing the risk level stakeholders can effectively manage the risk. The model can be applied to select alternatives in construction under risky environment.
Doloi H.	2009	Australia	Questionnaire Survey	Multiple linear regression models reveal that technical expertise, past success, time in business, work methods and working capital significantly impact on contractors' performance across time, cost and quality success. With a clear understanding of a contractor's performance, these findings could potentially contribute to the development of a company's procedures or enhance existing knowledge in relation to the pre-

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				qualification practices in contractor selection in projects.
Sidik	2010	Ghana	Questionnaire Survey	The significant factors determined after reduction were five, namely: Managerial factors, Quality and Standards factors, Resource Availability factors, Duration and Cost factors and Location factors. It was also revealed that Ghanaian construction professionals prefer multi-criteria selection of contractors to single criteria and would also allocate higher marks to technical evaluation than to financial evaluation in selecting a contractor for a project. However, very few of them know about modern multi-criteria selection methods such as Analytical Hierarchy Process, Analytical Network Process and Evidential Reasoning developed by researchers for multi-criteria selection.
Holt	2010	UK	Literature Review	Main research foci were observed as: modelling the CSn process; studying selection criteria; and "interrogation" of existing CSn systems. Foci justifiers are linked mainly to the "importance" and "difficulties" of CSn decision making. Preferred research tools were found to be system interrogation, rank order analysis and Likert scale/importance indices, with hypothesis testing and "other" methods used less so. Almost two-thirds of research products are CSn models, with derived or proffered processes, and knowledge relating to CSn criteria, between them representing approximately the remaining third of output.
Huang	2011	China	Theoretical Review	The study analyzed the criteria for construction contractor selection. The goal of construction is to deliver a completed project that serves the intended function. Anything in the construction process that does not

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				contribute to this goal is a potential obstacle and adds unnecessary risk to the project. Some clients may choose to use just one of the criteria used to qualify a candidate to the stage of tendering procedure and it is usually the contractor's experience.
Alotaibi	2011	Saudi Arabia	Mixed Methods	The findings of the initial research were used to establish a novel framework to help in measuring contractor performance prior to selection. The framework was tested through focus group workshops resulting in positive feedback and some alterations. The main findings of the study include the lack of an appropriate construction contractor performance evaluation framework in SA, and the identification and exploration of criteria and sub-criteria for a selection framework.
Yilmaz&Ergonul	2011	Turkey	Model Development	The concern of the model is the public authorities, who want and need to consider the factors other than price during contractor evaluation process of middle-size and semi-complex projects. The model was tested by a hypothetical scenario which evaluated four contractor candidates. The results showed that the model provides a guide for the public client to reward experienced, capable and qualified candidate contractors, and to eliminate incompetent, inexperienced, or underfinanced contractors for the success and quality of works.
Jiya	2012	Kaduna, Nigeria	Questionnaire Survey	The research discovered that technical capacity with over 58% of the professionals considered it important among the major prequalification criteria. The study recommends that professionals/ staff should aspire to understand, adopt and implement the requirements of contractors' prequalification criteria of building

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				works. The public organizations should standardize respective building construction prequalification practices in putting into consideration all criteria on contractors' prequalification checklist with percentage score allocation to each criterion.
Ghadamsi	2012	UK	Literature Review Framework Development	Besides offering a deeper understanding of procurement method relationships with project performance, the proposed conceptual framework forms basis for the development of the quantitative model at subsequent stages of the on-going study. The model's main objective is to serve as a tool for identifying which procurement method is likely to result in poor performance or vice versa, for any given project. This, hopefully, will assist clients in their procurement selection task, particularly for clients where the use of any of the existing selection model is not applicable.
Liefers	2012	Netherlands	Interview Survey	Conclusion from the cases is that projects that are straightforward are suitable for awarding on lowest price. If a project is complex or needs to be designed by the contractor multi-criteria selection is the desired method.
Lesniak*et al.*	2012	Poland	Document Study	The alternative for public clients may be the use of restricted tendering, with some kind of Prequalification of contractors. However, this type of awarding contracts in the D&B system, even though it is primary, is not particularly popular in Poland, as shown by the research. It should be emphasized that in case of the D&B system it is appropriate to use other criteria then price, which could definitely improve its efficiency.
Alzahrani&Emsley	2013	UK	Questionnaire Survey	Factors such as turnover history, quality policy, adequacy of labour and plant resources, waste disposal, size of past

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				projects completed, and company image are the most significant factors affecting projects success. Assuming that project success is repeatable, these findings provide clear understanding of contractors' performance and could potentially enhance existing knowledge of construction project success.
Kog&Yaman	2014	Turkey	Mixed Methods	It emphasized that there is an increment in the intelligent systems based solutions of contractor selection and prequalification problem. Another increment was observed in the hybrid solutions, which consist of different models and methods. Multi-agent based systems for the problems should be investigated; and some simulation techniques should be adapted to estimate realistic results of the tenders.
Monyane&Emuze	2015	South Africa	Interview Analysis	The identified loopholes were being unravelled face-to-face interviewing of people in construction who are involved in the contract award process. The results have shown that the human induced decision making factor still plays a major role in the dissatisfactions observed in the process. The procurement process still needs to be revisited to eliminate the human induced decision making approach that is often underpinned by bias, which in turn, award contracts to the wrong firm.
Rashvand*et al.*	2015	Malaysia	Literature Review	Among the prequalification criteria, the current evaluation that employed for management capability is highly ambiguous. Two important shortcomings of current prequalification models regarding the evaluation of management capability were identified. First, the models are not comprehensive since all the variables related to the management capability are not included. Secondly, the models focused exclusively on time and cost

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				performance as outcome variables, which may not be enough to evaluate the management capability of contractors. Better evaluation methods have to be developed to assess the management capability prequalification as it has a major impact on time and cost performance of contractors.
Araujo *et al.*	2015	Brazil	Review Model Development	In this context, the model proposed considered the interaction between a Group Decision and an Integer Programming method. Afterward, it was made a numerical application of the proposed model. The criteria used in this simulation were identified from a literature review in papers related to the supplier's selection in the construction industry.
Othman	2016	Libya	Questionnaire Survey	The research found that the Libya Construction Industry was suffering from a total absence of contractor selection frameworks. This directly impacts on client satisfaction as well as government planning in the reconstruction of the country after the civil war in particular. As a consequence of this study, the Contractor Selection Process (CSP) is now very comprehensive and can now be a reference for any problem. Even though the framework was built for the LCI, the research can be utilised in other countries that have a similar construction industry environment.
Brynjarsdottir	2016	Iceland	Mixed Methods	The results indicated that Icelandic organization use multiple criteria selection to some extent but price is the most important criteria. The criteria most frequently used are professional knowledge, experience of a similar project, and whether the contractor has worked for the organization before. Other criteria, such as financial stability of contractors, their health & safety

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				policy, and whether they work in accordance with a certified quality management system - have a much lower weigh in the selection process. These results indicated that the methods used are somewhat lacking and that there is ample room for improvement in order to minimize risk.
Lee	2016	Nigeria	Questionnaire Survey	The study demonstrated that the contractor selection is based on multi-criteria – beyond those traditionally used such as time, quality and cost – also known as "Iron triangle". Using multi-criteria prequalification methods helps developers to source for contractors with the necessary capabilities and expertise to match the complexity of projects. The study also highlighted the role of developer and contractor relationships as the non-financial criteria especially among small-sized developers firms.
Hosseini*et al.*	2016	Norway	Literature Review Document	Key selection criteria listed from the literature, categorized in three groups in this study, will assist decision-makers to come up with an adapted list to their project. Investigation of E39 Project revealed that some criteria may capture less interest in literature while being considered as main criteria in specific projects. This highlighted that there is a need to adapt the selection criteria for each individual project based on project characteristics, client characteristics and external environments. In addition, it is important to explore the interrelationship between selection criteria, since one criterion may exert on the others.
Alptekin&Alptekin	2017	Turkey	Questionnaire Survey	The analysis results show that "termination of construction work" criterion in contractor selection process is the most important one. "Lowest bid" criterion is ranked in fifth rank among

Author	Year	Place	Research Methodology Adopted	Summary of Findings
				twelve criteria. The results show that the taking consideration of other attributes of contractors in contractor selection process for public building works can be useful in evaluating experienced, capable and qualified candidate contractors and eliminating incompetent, inexperienced, or underfinanced contractors during the bidding process.
Afolayan*et al.*,	2018	Nigeria	Questionnaire Survey	The results showed that Technical capability of contractors ranked the most important of the existing pre-qualification criterion followed by Management capability among others. The study concluded that past performance of contractors was the most important existing criterion for contractor pre-qualification in the study area among others while the most determinant factor in the choice of these criteria was contractor's resources, which must be considered in the selection of contractors.
Nkata*et al.*,	2017	Nigeria	Questionnaire Survey	Past performance was observed as the most important existing criteria while contractors experience follow closely in the ranking of the contractors.

(**Source:** Author's Compilation, 2019)

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The researcher considered the sequential mixed methods design for the study. It was adopted because of the nature of the data obtained: qualitative and quantitative. According to Creswell and Clark (2011), a mixed methods research design involves a process of collecting, analysing, and mixing quantitative and qualitative data when carrying out one or various studies, in order to understand the research problems or questions. The aim of using a mixed method design was to give an improved understanding of the research problem or question; unlike when the two methods are considered separately. This study exploited the sequential mixed methods design (Creswell, 2012) which involves the collection of the qualitative data in the first instant to explore the issue of contractor selection criteria for public projects in Nigeria; the quantitative data was collected to explain the relationships found in the qualitative exploration.

Survey Research involves the collection of information from a sample of individuals through their responses to questions (Saunders *et al.*, 2016).This type of research allows for a variety of methods to recruit participants, collect data, and utilize various methods of instrumentation (Morenikeji, 2006). The survey was carried out among professionals who have been involved in public project while interviews were conducted among the Heads of Procurement in the public sector.

3.2 Research Methods

3.2.1 Questionnaire survey

The quantitative aspect of the study made use of questionnaire in order to discover as much as possible about the influence of contractors' selection criteria on project delivery in public

projects in Abuja Metropolis. Masejane (2012) gave an insight on questionnaire suggesting it to be a collection of questions; an examination of typical questionnaire will probably reveal as many statements as questions. Often the researcher is interested in determining the extent to which the respondents hold a particular attitude or perspective. The items and questions formulated and selected carefully and the objectives of the research must continuously be borne in mind (Oscham, 2005). The questionnaires were self-administered to two hundred and ninety-eight (298) respondents, and collected by the researcher from the respondents within the study area.

3.2.1.1 Population

The population of the study for the questionnaire consist of professionals in the construction industry in the study area; they were chosen because of the crucial role they play in the selection of contractors. The population size comprised of number of these stakeholders in Abuja who have been involved in public projects.

3.2.1.2 Sample size

The sample size aims at making inferences about a population from a sample. Its determination is the act of choosing observation or replicates to include a statistical sample (Kothari, 2004). The survey population comprise of registered professionals in the construction industry that were based in the study area, namely Architects, Builders, and Quantity Surveyors; and the sample size was obtained using the Taro Yamane's formula (Dada et al., 20117). The sample size comprised of two hundred and ninety eight (298) respondents as shown in Table 3.1.

The Taro Yamane's formula is:

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

Where n = sample size sought

N = Population size

e = Level of significance (0.05)

3.2.1.3 Sampling technique

The study adopted the random sampling method which is a method under the probability sampling technique that was chosen so that every member of the parent population would have equal opportunities or chances of been selected in the sample. However, before this process of random sampling was carried out, the number of respondents to be allotted to each of the group of professionals was determined using the proportional stratified random sampling method as used in a study by (Dada *et al.*, 2017). Hence, the formula below;

$$n = \frac{p}{N}$$

Where p = Population of each strata

N = Total population

n = Total sample size

R = Number of respondents for each strata

Table 3.1: Sample size of each component of the questionnaire survey

S/n	Registered Professionals	Population	Sample size
1	Architects	631	162
2	Builders	441	112
3	Quantity surveyors	92	24
	Total	**1164**	**298**

(**Source:** Author's Survey, 2019)

As shown in Table 3.1 above, the sample sizes of each stratum of professionals stand for the number of respondents that the questionnaires were administered on. For the process of the random sampling, directories of the various professional bodies in Abuja that contained the information of the registered professionals were collected and used to select the respondents. A table of random numbers was generated and used to pick the various professionals/respondents in an ascending manner, from the directories.

3.2.2 Interview

The data collectiontechnique adopted for the qualitative aspect of the research was structured interviewed utilising both open ended method as the same question will be asked from all the participants.Masejane (2012) explained that an interview is an alternative method of collecting survey data, where the researcher ask questions orally and record the respondents' answer. The research made use of the structured interviews, utilising both open ended questions in which participants were asked the same questions and also documents containing necessary information for the study were gotten from the interviewees collected for further analysis. Personal face-to-face interview was used for the purpose of this research. The interview guide was used and the interviewee's responses phone recorded per session with an average time of forty (40) minutes per participant.

3.2.2.1Population

The population of this segment of the study were the public client organizations in the study area; they were chosen because of the crucial role they play in the selection of contractors. The interview sample comprised of ten (10) Parastatals and Agencies in Abuja who have been clients to construction projects in the public sector; hence, the population frame were the Head of

Tenders section of these Parastatals. The Parastatals and Agencies where the participants were drawn are;

1. Federal Housing Authority.
2. Federal Capital Development Authority.
3. Federal Ministry of Environment
4. National Universities Commission.
5. National Youth Service Corp.
6. Nigeria Police Force.
7. Tertiary Education Trust Fund.
8. Federal Ministry of Education.
9. Federal Ministry of Interior
10. Public Complaint Commission.

3.2.2.2 Sample size and sampling technique

The study adopted purposive sampling method for the interview. Purposive sample is a non-probability sample that is selected based on characteristics of the population and objectives of the study (Adetayo, 2001). It is chosen because of the peculiarity of the information obtained from the respondents; this is because the respondents involved are those who have been involved in public projects, and the public sector parastatals best suits the purpose. Hence, the sample size was taken to be ten (10) Heads of Procurement section.

3.3 Data Analysis

Questionnaire: The research questions, as reflected on the sections of completed copies of questionnaire were analysed using Mean score, Factor analysis, and Canonical correlation and Regression analysis

Table 3.2: Statistical tools for analysis of research objectives

S/n	Objectives	Tool for Analysis
1	The selection criteria process of contractors for project delivery	Thematic analysis/ Mean score
2	The barriers hindering the optimum selection of contractors	Mean Score
3	The factors considered in the selection of contractors for project delivery	Mean score
4	The critical success factors (CSFs) for project delivery	Mean score
5	The relationship between the factors considered in the selection of contractors and CSF in project delivery	Factor Analysis, Canonical correlation and Regression analysis

(**Source**: Author's Compilation, 2019)

Interview: The structured questions were answered by the participants and further analysed using the thematic method of analysis. Thematic analysis is the process of recognizing patterns or themes contained by qualitative data. Braun and Clarke (2006) advocated it as the first qualitative method that ought to be learned as it provides core skills that will be useful for conducting many other kinds of analysis. An auxiliary advantage, particularly from the perspective of learning and teaching, is that it is a method rather than a methodology (Braun & Clarke, 2006; Clarke & Braun, 2013). Thematic Analysis is not tied to a particular epistemological or theoretical perspective; hence making it a very flexible method. The purpose of a thematic analysis is to spot themes, patterns in the data that are important and formulated codes to answer the research questions.

Document Study: Content analysis was carried out on the documents collected from the public client. Sadelowski (1995) stated that the method is used to analyse written, verbal or visual communication messages. Content analysis is a systematic and objective means of describing and quantifying phenomena. The method is used for making replicable and valid inferences from data to their context, with the purpose of providing knowledge, new insights, a representation of

facts and a practical guide to action (Maguire& Delahunt, 2017). An advantage of the method is that large volumes of documented data and different written sources can be treated and used in substantiating evidence.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Data Presentation

The sequential mixed method design adopted for the research is characterised by an initial qualitative phase of data collection and analysis, followed by a phase of quantitative data collection and analysis with a final phase of integration or linking of data from the two separate strata of data.

4.2 Analysis of the Interview.

In the interview study, the ten (10) participants from the ten selected public organisations were available for the study and the eleven (11) structured questions were administered on them. The responses were properly recorded on paper and phone; which was transcribed and arranged for analysis. The interview questions were sorted in line with the research objectives wherebycodes generated from the responses formed the themes for the analysis.

4.2.1 Selection Criteria Process of Contractors

Table 4.1: Type of tendering system adopted

Participant	Response	Code
National Universities Commission	"*Open competitive*"	Open Tendering
TETFund	"*Open competition*"	Open Tendering
Public Complaint Commission	"*Open competition*"	Open Tendering
National Youth Service Corp	"*Two envelope system; financial and technical"*	Negotiated Tendering
Nigeria Police Force	"*Open competitive, Selective, serial tendering*"	Open, Selective and Serial Tendering
Federal Ministry of Interior	"*Open competitive Direct tendering*	Open, Selective Tendering

Table 4.1a: Type of tendering system adopted

Participant	Response	Code
Federal ministry of Education	"*Open competitive system*"	Open Tendering
Federal Ministry of Environment	"*One stage tendering*"	Single stage & Two-stage Tendering
Federal Housing Authority	"*Open competitive*"	Open Tendering
Federal Capital Territory Authority	"*Open competitive*"	Open Tendering

(**Source**: Author's Survey, 2019)

The outcome from the coding reveals that the Open and Selective Tendering system are mostly used by the participants for public projects delivery.This is in alignment with the study by Ashworth (2013) that concluded that the process of open tendering allows contractors to give in their tenders for a project and Liefers (2012) outlined the advantage of the selective tendering as possessing relative short turnaround and less documentation.

Table 4.2: Process of selection of contractor

Participant	Response	Code
National Universities Commission	*Advertisement in 2 National dailies and one Federal Tender Journal for six weeks* *Prequalification* *Evaluation* *Report and award* *Document: yes*"	Tendering Procedure
TETFund	"*Advertisement in two (2) National dailies and one(1) Federal Tender Journal* *Prequalification* *Tender evaluation* *Report of the bid evaluation* *Award* *Document: yes*"	Tendering Procedure
Public Complaint Commission	"*Advertisement in 2 National dailies and one Federal Tender Journal for six weeks* *Prequalification* *Evaluation* *Report and award* *Document: yes*"	Tendering Procedure

Table 4.2a: Process of selection of contractor

Participant	Response	Code
National Youth Service Corps	"*Advertisement in 2 National dailies with the entire stipulated requirement stated in accordance to public procurement Act 2007. Documents: yes*"	Tendering Procedure
Nigeria Police Force	"*Advertisement in 2 national dailies with all the stipulated requirement stated in accordance to public procurement Act 2007 Document: yes*"	Tendering Procedure
Federal Ministry of Interior	"*Budgetary appropriation Procurement plan, Advertisement, Prequalification Bid evaluation(Technical and financial) Report of tenders committee*"	Tendering Procedure
Federal Ministry of Education	"*Advertisement in 2 National dailies with the entire stipulated requirement stated in accordance to public procurement Act 2007. Documents: yes*"	Tendering Procedure
Federal Ministry of Environment	"*Invitation to tender Submission of technical and Financial bid Bid opening prequalification Evaluation Award*"	Tendering Procedure
Federal Housing Authority	"*Intent to procure after NEEDS assessment Procurement plan, Advertisement Financial and technical bid evaluation Tenders board report Awards of contract*"	Tendering Procedure
Federal Capital Territory Authority	"*Approval of technical evaluation Conduct of the due diligence Opening and evaluation of bid Tender Boards approval Ministerial approval Award letter*"	Tendering Procedure

(**Source**: Author's Survey, 2019)

The outcome from the interview response and coding reveals that six (6) out of the 10 interviewed agreed that tendering process involves advertisement in two (2) National dailies and one (1) Federal Tender Journal, prequalification, tender evaluation and award.Bennet(2003) agreed that the client describes the project briefly andwhen the general announcement of this

tender is made, the selection and bid documents are submitted simultaneously prior to the presentation date.

Table 4.3: Objectives of the client in the prequalification

Participant	Response	Code
National Universities Commission	*"To select a contractor that is financially and technically capable to deliver projects efficiently with respect to time, cost and quality."*	Technical & Financial Capability
TETFund	*"To select a contractor that is capable in terms of technical and financial capability"*	Technical & Financial Capability
Public Complaint Commission	*"To select a contractor that is capable technically and financially"*	Technical & Financial Capability
National Youth Service Corps	*"To ensure that contractors are selected in accordance to the public Procurement Act"*	Technical & Financial Capability Management Capability
Nigeria Police Force	*"To ensure that the most responsive contractor is selected"*	Experience
Federal ministry of Interior	*"To get value for money"*	Technical & Financial Capability Experience
Federal ministry of Education	*"To get value for money and complete project in stipulated time."*	Value for money
Federal Ministry of Environment	*"To select the most technically competent contractor"*	Technical Capability
Federal Housing Authority	*"To achieve prompt delivery of contracts awarded with respect to time, quality and cost"*	Technical & Financial Capability
Federal Capital Territory Authority	*"To determine that bid document are genuine and disqualify non responsive contractors."*	Management Capability Technical & Financial Capability

(Source: Author's Survey, 2019)

The outcome from the coding reveals that 8 out of the 10 responses representing 80% reveals that the objectives of prequalification is to select a contractor that financially and technically stable(Haung,2011).

Table 4.4: Criteria for pre-qualification

Participant	Response	Code
National Universities Commission	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission, Industrial Training Fund(ITF), Bureau for Public Procurement, Plant and equipment, financial and technical capability."*	(PPA,2007) Mandatory requirements and project specific criteria.
TETFund	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission,Industrial Training Fund(ITF) Bureau for Public Procurement, Plant and equipment, financial and technical capabilities, sworn affidavit experience and track record."*	(PPA,2007) Mandatory requirements and project specific criteria.
Public Complaint Commission	*"Solicitation documents* *"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration Pension Commission, Industrial Training Fund,(ITF), registration with Bureau for Public Procurement, Plant and equipment financial, technical capabilities, sworn affidavit experience and track record."*	(PPA,2007) Mandatory requirements and project specific criteria.
National Youth Service Corps	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission, Industrial Training Fund,(ITF), Bureau for Public Procurement, and Company Annual Turnover"*	(PPA,2007) Mandatory requirements and project specific criteria.
Nigeria Police Force	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission,* Registration with *Industrial Training Fund,(ITF), registration with Bureau for public Procurement, and Company Annual Turnover, sworn affidavit, experience and track record."*	(PPA,2007) Mandatory requirements and project specific criteria.
Federal Ministry of Interior	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission,Industrial Training Fund,(ITF),Bureau for Public Procurement past experience and research on subject matter."*	(PPA,2007) Mandatory requirements and project specific criteria.
Federal Ministry of Education	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission, Industrial Training Fund,(ITF), registration with Bureau for Public Procurement.*	(PPA,2007) Mandatory requirements and project specific criteria.

Table 4.4a: Criteria for pre-qualification

Participant	Response	Code
Federal Ministry of Environment	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission, Industrial Training Fund,(ITF),Bureau for Public Procurement, technical competence of relevant personnel, experience in carrying out similar jobs"*	(PPA,2007) Mandatory requirements and project specific criteria.
Federal Housing Authority	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission, Industrial Training Fund,(ITF),Bureau for Public Procurement and Company Annual Turnover"*	(PPA,2007) Mandatory requirements and project specific criteria.
Federal Capital Territory Authority	*"Evidence of Company Incorporation, Tax Clearance Certificate (TCC), Registration with Pension Commission,Industrial Training Fund,(ITF), registration with Bureau for Public Procurement, and Company Annual Turnover"*	(PPA,2007) Mandatory requirements and project specific criteria.

(**Source**: Author's Survey, 2019)

The interview response and the coding revealed that the all the participants agreed that criteria for prequalification included evidence of Company Incorporation, Tax Clearance Certificate(TCC),registration with Pension Commission, Industrial Training Fund (ITF) and Bureau for Public Procurement(PPA,2007).

Table 4.5: Criteria for bid evaluation

Participant	Response	Code
National Universities Commission	*Tender price, financial standing, technical capability, plants and equipment*	Multi criteria
TETFund	*"Tender analysis* *Comparative rate analysis"*	Multi Criteria
Public Complaint Commission	*"Preliminary examination* *"tender price*	Price only

Table 4.5a: Criteria for bid evaluation

Participant	Response	Code
National Youth Service Corps	*"tender price* *Financial capacity* *"technical capability"*	Multi Criteria
Nigeria Police Force	*"Checking price element* *Checking arithmetic error"*	Price only
Federal ministry of Interior	*"Analysis of the open competitive method as provided in PPA 2007* *Tender price"* *experience*	Multi Criteria
Federal ministry of Education	*"Due diligence report evaluation* *"Tender price,financial capability* *Technical capability.*	Multi Criteria
Federal Ministry of Environment	*"Preliminary examination* *Financial capability,tender price.* *"Detail Analysis of tender"*	Multi- Criteria
Federal Housing Authority	*"tender price,, financial and technical*	Multi Criteria
Federal Capital Territory Authority	*"Analysis of the score sheet based on prequalification criteria in the specified prices,plants and equipment*	Multi Criteria

(**Source**: Author's Survey, 2019)

Multi – Criteria system is widely practiced over price only system in tender evaluation, this is reflective of findings in previous studies by Doloi (2009) which affirmed that the traditional "Price Only" assessment criteria is inadequate for the satisfactory delivery of Public Building Projects.

Table 4.6: Hindrances encountered in the selection of contractors

Participant	Response	Code
National Universities Commission	*"Inability of procurement officer to authenticate documents submitted by contractors.* *Interference from higher authority.*	Use of fictitious document by contractors.
TETFund	*Political interference from higher authority"*	Undue interference from higher authority
Public Complaint Commission	*"Undue interference from higher authority"*	Undue interference from higher authority

Table 4.6a: Hindrances encountered in the selection of contractors

Participant	Response	Code
National Youth Service Corps	*"Presentation of fake document Lack of adherence to conditions guiding submission of document"*	Use of fictitious document by contractors.
Nigeria Police Force	*"External influence Inadequate time to provide due diligence report."*	Undue interference from higher authority
Federal ministry of Interior	*"Inability of procurement officer to authenticate documents submitted by contractors. Interference from higher authority."*	Use of fictitious document by contractors, incorrect information
Federal ministry of Education	*"External influence Inadequate time to provide due diligence report. Submission of fake company profile and other documents"*	Use of fictitious document by contractors, undue interference from higher authority.
Federal Ministry of Environment	*"Submission of fake document Non adherence to instruction by contractors"*	Use of fictitious document by contractors.
Federal Housing Authority	*"Interference from higher authority"*	Undue interference from higher authority
Federal Capital Territory Authority	*"Submission of fake document Non adherence to instruction by contractors"*	Use of fictitious document by contractors.

(**Source:** Author's Survey, 2019)

All the participants agreed that the use of fictitious documents by contractors and undue interference from higher authority constitute barriers hindering the selection of contractor.Olatunji(2008) in a study concluded that problems with the construction industry are not restricted to contractors alone, most times consultants to projects are not prequalified, hence validation and physical assessment of records regarding their capacities as claimed are not verified which leads to an ineffective process in the selection of contractors.

Table 4.7: Influence by external forces and other difficulties faced during the selection process

Participant	Response	Code
National Universities Commission	*"Yes. Undue interference from higher authorities."*	Influence of external forces or cartels
TETFund	*"Yes ; Political interest and interference from higher authority"*	Influence of external forces or cartels
Public Complaint Commission	*"Yes, clash of interest amongst stakeholder"*	Political influence
National Youth Service Corps	*"No external interferences because stringent rules are applied in the selection process* *Delay in budgetary allocation* *Inf* *lationary trend in prices of materials"*	Use of fictitious document by contractors.
Nigeria Police Force	*"Yes, but limited interference"*	Influence of external forces or cartels
Federal Ministry of Interior	*"Inability of procurement officer to authenticate genuine documents submitted* *Interference from higher authorities."*	Use of fictitious document by contractors.
Federal Ministry of Education	*"Yes, but limited interference"*	Political influence
Federal Ministry of Environment	*"Yes, but in few cases.* *Lack of data to access the internet* *Poor motivation of procurement officers"*	Economic situation
Federal Housing Authority	*"No* *Capital releases not regular"*	Economic situation
Federal Capital Territory Authority	*"No external forces* *Verification of authentication of documents submitted."*	Use of fictitious document by contractors. Bidding situation.

(Source: Author's Survey, 2019)

The participants agreed that the use of fictitious document, undue influence from higher authorities and the bidding situation are amongst difficulties encountered which is also in alignment with the study by (Olatunji, 2008) on the barriers encountered in the selection process

that concluded that incorrect information by contractors, external influence and collusion by contractors hinders the selection.

Table 4.8: **Common basis of contractor selection**

Participant	Response	Code
National Universities Commission	*"Yes. Mandatory requirement are the common basis, others include personnel capability, experience and performance of the company, technical and financial capability."*	Technical & Financial Capability Personnel Capability, Experience
TETFund	*"Yes past experience and performance of the contractor"*	Experience Technical Capability
Public Complaint Commission	*"Yes. Must possess all the criteria as stated in the advertisement and all mandatory requirements."*	Experience Technical & Financial Capability
National Youth Service Corps	*"Yes, all condition stated in the advertisement must be met"*	Technical & Financial Capability Personnel capability Management Capability
Nigeria Police Force	*"Yes, we employ the bid evaluation criteria"*	Financial Capability Personnel capability
Federal Ministry of Interior	*"Yes. Mandatory requirement are the common basis, others include personnel capability, experience of the company, technical and financial capability."*	Personnel capabilityExperience Technical & Financial Capability Experience
Federal Ministry of Education	*"Yes. Must possess all the criteria as stated in the advertisement and all mandatory requirements."*	Experience Technical & Financial Capability Management Capability Plant and Equipment
Federal Ministry of Environment	*"Yes, the contractor must possess the complete mandatory requirement as required in the bidding document or as advertised."*	Experience; Technical Capability
Federal Housing Authority	*"Yes, all criteria as stipulated in the advertisement as required by the procurement Act 2007."*	Technical & Financial Capability
Federal Capital Territory Authority	*"Yes. All bidders must be substantially responsive to be prequalified adopting 'yes' or 'No' in the assessment. Only companies that meet with the entire yes' are prequalified."*	Management Capability Technical & Financial Capability

(**Source**: Author's survey 2019)

The participants opined that project specific criteria such as Financial and technical capacities are assessor major parameter for selection of contractors.It is necessary to clarify develop pre-determined selection criteria and objective of the prequalification process (Watt *etal*., 2010)

Table 4.9: Major criteria attributes needed before selection of contractors

Participant	Response	Code
National Universities Commission	*"Technical and financial capability."*	Technical & Financial Capability
TETFund	*"Financial capability* *Technical Capacity* *Plant/ equipment"*	Technical & Financial Capability Plant and Equipment
Public Complaint Commission	*"Must possess all the criteria as stipulated in the advertisement* *No major or minor attribute"*	Experience; Technical & Financial Capability
National Youth Service Corp	*"CAC,TCC,PENCOM,ITF, BPP Registration ,list of equipment and equipment, Financial and technical capability"*	Technical & Financial Capability Plant and Equipment Management Capability
Nigeria Police Force	*"Consistencies in pricing* *Fluctuation in market price"*	Financial Capability Personnel capability
Federal Ministry of Interior	*"Technical capability* *Current work at hand* *Financial capability"*	Personnel capabilityExperience Technical & Financial Capability Experience
Federal Ministry of Education	*"As stipulated in the advertisement as required by the procurement Act 2007"*	Experience Technical & Financial Capability Management Capability Plant and Equipment
Federal Ministry of Environment	*"Evidence of similar job done in the past, Bank Guarantee to show financial capability to execute jobs."*	Experience; Financial Capability
Federal Housing Authority	*"As stipulated in the advertisement as required by the procurement Act 2007"*	Technical & Financial Capability
Federal Capital Territory Authority	*"Eligibility of the document* *Financial capability* *Legal capability* *Due diligence"*	Management Capability Technical & Financial Capability

(**Source**: Author's Survey, 2019

Technical capacity, Experience financial capacity, Plants and equipment were adjudged to be the major criteria attributes considered before selection.Comprehensive contractor evaluation conducted prior to selection can significantly reduce the risk experienced by a construction project (Puri&Tiwari,2014)

Table 4.10: Project delivery features in the selection of contractors.

Participant	Response	Code
National Universities Commission	*"Yes. To achieve value for money and reduce the likelihood of project abandonment."*	Procurement related factors Adequate planning factors
TETFund	*"Yes. Value for money and completion time is essential to project delivery since variation and price review are not allowed for contracts in the in the organization"*	Procurement related factors Adequate planning factors
Public Complaint Commission	*"Yes. Completion period is of essence."*	Procurement related factors Adequate planning factors
National Youth Service Corps	*"Yes most of the projects in the organization are time bound hence prompt delivery is required with respect to time , quality and cost"*	Procurement related factors Adequate planning factors
Nigeria Police Force	*"Time is important which is dependent on the availability of funds for the project"*	Procurement related factors Adequate planning factors
Federal Ministry of Interior	*"Yes. Completion period and delivery time is dependent on the cost of the project"*	Procurement related factors Adequate planning factors
Federal Ministry of Education	*"Project delivery is given priority to reduce the rate of abandoned project in the Country".*	Procurement related factors Adequate planning factors
Federal Ministry of Environment	*"Project delivery is given priority to reduce the rate of abandoned project in the country."*	Procurement related factors Adequate planning factors
Federal Housing Authority	*"Yes, to achieve high value for money."*	Procurement related factors Adequate planning factors
Federal Capital Territory Authority	*"Yes, it gives value for money. Ensure prompt delivery of services."*	Procurement related factors Adequate planning factors

(**Source:** Author's Survey, 2019)

Effective Project delivery is derived by adequate planning factors and procurement related factors as identified by the participants, this did not contradict the study by Afolayan*et al.*(2007) indicating that the success factors of a project are the elements or activities required in ensuring success criteria are achieved such as adequate planning and tendering methods.

Table 4.11: Project delivery factors considered in contractor selection

Participant	Response	Code
National Universities Commission	*"Financial and technical capability, past experience and performance and managerial capability"*	Technical & Financial Capability; Experience
TETFund	*"Financial capability* *Technical capability* *Plant and equipment holding"*	Technical & Financial Capability Plant and Equipment
Public Complaint Commission	*"Technical capability* *Financial capability"*	Technical & Financial Capability
National Youth Service Commission	*"Technical capacity* *Financial capacity* *Time of award"*	Technical & Financial Capability Management Capability
Nigerian Police Force	*"As stipulated in the Public Procurement Act 2007"*	Technical & Financial Capability Personnel capability
Federal ministry of Interior	*"Yes. Completion period and delivery time is dependent on the cost of the project"*	Financial Capability Experience
Federal ministry of education	*"Completion period."*	Management Capability
Federal Ministry of Environment	*"Evidence of similar job done in the past as well as evidence of financial capability from a commercial bank"*	Experience; Financial Capability
Federal Housing Authority	*"Technical capability* *Financial capacity* *Equipment and plant* *Experience of previous work* *Personnel capacity."*	Technical & Financial Capability Experience Plant and Equipment
Federal Capital Territory Authority	*"Technical expertise financial* *Due diligence* *Valid bid security"*	Management Capability Technical & Financial Capability

(**Source**: Author's Survey, 2019)

All the participants agreed that Financial,Technical and Management capacity are the most important factors in the selection process, this is reflective in previous studies where Doloi

(2009); Hatush(1996); Hatush&Skitmore (1997) concluded that Past Performance, Experience, Technical, Financial Stability are well used determinant for contractor selection.

4.3 Analysis of the Questionnaires

The copies of the questionnaire that were properly filled and returned from the field were one hundred and eighty-five (185), out of the two hundred and ninety-eight (298) copies that were administered on the respondents. This represented a response rate of 62.1% which is far above the 30% rate, as a satisfactory response rate in construction studies (Williams,2007). Hence, the total of one hundred and eighty-five copies of the questionnaire was used for the analysis. The response rate for the questionnaire study is shown in Table 4.12.

Table 4.12: The response rate

Responses	Number	Percentage
Questionnaires properly filled and returned	185	62.1
Questionnaires not properly filled and returned	113	37.9
Total	298	100

(**Source**: Author's Survey, 2019)

4.3.1 Respondents' Socio-economic characteristic

Table 4.13, 4.13a shows the outcome of the respondents' characteristics as obtained from the one hundred and eighty-five (185) copies of questionnaire used for the analysis. The characteristics are: sex, nationality, age, years of experience, educational status, and professional affiliation.

Table 4.13: Outcome of respondents' characteristics

Characteristics	Frequency	Percentage
Sex		
Male	157	84.9
Female	28	15.1
Nationality		
Nigerian	185	100
Non-Nigerian	0	0

Table 4.13a: Outcome of respondents' characteristics

Characteristics	Frequency	Percentage
Respondents' Age		
21-30 years	14	7.6
31-40 years	42	22.7
41-50 years	70	37.8
51-60 years	59	31.9
Above 60 years	0	0
Years of Experience		
1-5 years	15	8.1
6-10 years	36	19.5
11-15 years	44	23.8
16-20 years	59	31.9
21-25 years	31	16.8
Above 25 years	0	0
Educational Status		
OND	0	0
HND	30	16.3
BSc	80	43.2
MSc	59	31.9
PhD	16	8.6
Professional Affiliation		
NIOB	66	35.7
NIA	98	53.0
NIQS	21	11.4

(Source: Author's Survey, 2019)

The result on the sex distribution shows that 84.9% of the respondents were male, while 15.1% of them were female. The nationality distribution of the respondents reveals that 100% of the respondents were Nigerian.

The age distribution of the respondents reflects that 7.6% of the respondents were between the age range of 21-30 years, 22.7% of them were between the range of 31-40 years, 37.8% were between 41-50 years, 31.9% were between 51-60 years, while none were above 60 years. This also reveals that the conclusion of the study will be satisfactory, since over 70% of the respondents are advanced enough to understand the system of contractor selection in Nigeria over the years.

The result for the respondents' years of experience reveals that 8.1% of the respondents had experience between 1-5 years, 19.5% of them had experience between 6-10 years, 23.8% had experience between 11-15 years, 31.9% had experience between 16-20 years, 16.8% had experience between 21-25 years, and none of the respondents had above 25 years.

The result on the educational status of the respondents shows that none of the respondents filled the Ordinary National Diploma (OND) status, 16.3% have the Higher National Diploma (HND); 43.2% attained the Bachelor of Science (BSc) degree, 31.9% had attained the Master of Science (MSc) Degree, while 8.6% had attained the Doctor of Philosophy (PhD) status. This shows that the respondents are qualified through experience, expertise and training to give the relevant information needed for the study. It is also seen that all the respondents were affiliated to their respective professional bodies which are the Nigerian Institute of Building (NIOB), Nigerian Institute of Quantity Surveyors (NIQS), and the Nigerian Institute of Architects (NIA). This implies that all the respondents were registered professionals in their professions.

4.3.2 Determination of the Selection Criteria Process of Contractors

Table 4.14: The selection criteria process of contractors

	Overall			Builder			Architect			Quantity S.		
Tendering Type	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Selective	**185**	**4.66**	**1**	66	4.70	1	98	4.65	1	21	4.62	1
Competitive	**185**	**4.54**	**2**	66	4.61	2	98	4.51	2	21	4.48	2
Negotiated	**185**	**3.52**	**3**	66	3.55	3	98	3.49	3	21	3.57	3
Turnkey	**185**	**3.15**	**4**	66	3.14	4	98	3.13	5	21	3.29	4
Single Stage	**185**	**3.12**	**5**	66	3.12	5	98	3.15	4	21	3.00	7
Two Stage	**185**	**3.10**	**6**	66	3.08	6	98	3.10	6	21	3.19	5
Serial	**185**	**3.10**	**6**	66	3.08	6	98	3.09	7	21	3.19	5

* M.S: Mean Score; N: Total
(Source: Author's Survey, 2019)

Table 4.14 shows responses of the professionals with regards to the selection criteria process of contractorsin the study area as outlined below. It is thus observed that the most utilised selection criteria process of contractors is the selective process (Ranked 1st), followed by competitive (Ranked 2nd) and negotiated (Ranked 3rd). For the fact that all these processes for contractor selection scored well above the 2.5 average score, it indicates a high level of utilisation of these selection processes according to the professionals in the study area. In the ranking of the various professionals' view, it is also observed that there are no statistical differences in the view that the first three ranked variables are the major processes used in the selection of contractors.

This outcome is totally in agreement with a study carried out by Liefers (2012) and Asworth (2013) describing the frequency and acceptability of the different systems of tendering and unveiled that 0open tendering system gives opportunity to all contractors. This study also agrees with Bennett (2003) on the selective process of tendering; the study explained that the client describes the project briefly and then extends invitation to suitable candidates to apply for the project. When the general announcement of this tender is made, the selection and bid documents aresubmitted simultaneously prior to the presentation date. The bidders will be assessed using the selection criteria and the final award.

4.3.3 To examine barriers hindering the optimum selection of contractors

Table 4.15: The barriers hindering the optimum selection of contractors

	Overall			Builder			Architect			Quantity S.		
Barriers	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Use of fictitious document by contractors		**4.75**	**1**									
Presentation of false bank account	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
False profile of technical staff	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Fictitious increase in staff strength	185	4.75	3	66	4.76	3	98	4.74	3	21	4.76	3

Table 4.15a: The barriers hindering the optimum selection of contractors

	Overall			Builder			Architect			Quantity S.		
Barriers	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Fictitious claim to plant and equipment	185	4.67	4	66	4.68	4	98	4.66	5	21	4.67	4
Improper presentation of past projects	185	4.65	5	66	4.64	5	98	4.67	4	21	4.62	5
Prequalification of consultants		**4.72**	**2**									
Qualification of consultants	185	4.92	1	66	4.92	1	98	4.92	1	21	4.90	1
Inadequate time to prequalify consultant	185	4.91	2	66	4.91	2	98	4.92	1	21	4.90	1
Capability of consultants	185	4.34	3	66	4.36	3	98	4.33	3	21	4.33	3
Tender price and estimates		**4.63**	**3**									
Labour rates	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Preliminaries	185	4.83	2	66	4.82	2	98	4.83	2	21	4.86	2
Material cost	185	4.65	3	66	4.67	3	98	4.64	3	21	4.62	3
Builders work	185	4.44	4	66	4.44	4	98	4.45	4	21	4.43	4
Wrong method of estimation	185	4.25	5	66	4.27	5	98	4.26	5	21	4.19	5
Project documentation		**4.60**	**4**									
Type of project	185	4.92	1	66	4.92	1	98	4.92	1	21	4.90	1
Type of procurement method	185	4.83	2	66	4.83	2	98	4.84	2	21	4.81	2
Client consultation and involvement	185	4.66	3	66	4.65	3	98	4.67	3	21	4.62	3
Completeness of documents	185	4.34	4	66	4.35	4	98	4.33	4	21	4.38	5
Level of Technology	185	4.26	5	66	4.24	5	98	4.24	5	21	4.43	4
Insufficient time for selection process		**4.60**	**4**									
Delay in contractual procedures	185	4.83	1	66	4.82	1	98	4.84	1	21	4.81	1
Governments policies	185	4.75	2	66	4.74	2	98	4.76	2	21	4.71	2
Assessors excuses and unwillingness	185	4.66	3	66	4.67	3	98	4.67	3	21	4.62	3
Public contracts are procured only within a budget year	185	4.17	4	66	4.18	4	98	4.14	4	21	4.29	4

Table 4.15b: The barriers hindering the optimum selection of contractors

	Overall			Builder			Architect			Quantity S.		
Barriers	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Wrong presentation of pre-qualification documents by the contractors.		**4.59**	**6**									
Lack of good understanding of how to present the basic data demanded	185	4.83	1	66	4.82	1	98	4.84	1	21	4.81	1
Absence of certificates of practical completion on similar jobs executed	185	4.67	2	66	4.67	2	98	4.67	2	21	4.67	2
Arithmetic errors in computation of prices	185	4.59	3	66	4.59	3	98	4.58	3	21	4.62	3
None possession of letters of awards from previous jobs	185	4.26	4	66	4.30	4	98	4.22	4	21	4.33	4
Compliance with statutory procurement laws		**4.57**	**7**									
Evidence of Company Registration	185	4.92	1	66	4.91	1	98	4.93	1	21	4.90	1
Evidence of Tax payment	185	4.66	2	66	4.67	2	98	4.66	2	21	4.62	2
Registration with Pension Commission	185	4.58	3	66	4.58	3	98	4.58	3	21	4.62	2
Registration with Bureau for public procurement	185	4.42	4	66	4.41	4	98	4.42	4	21	4.43	4
Registration with Industrial Trust Fund	185	4.25	5	66	4.26	5	98	4.24	5	21	4.24	5
Bidding situation		**4.57**	**7**									
Number of competitors	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Bidding document requirement	185	4.59	2	66	4.61	2	98	4.58	2	21	4.62	2
Identity of competitors	185	4.50	3	66	4.52	3	98	4.51	3	21	4.43	4
Incomplete information from client and stakeholders.	185	4.50	3	66	4.50	4	98	4.49	4	21	4.52	3
Prequalification document	185	4.42	5	66	4.41	5	98	4.42	5	21	4.43	4
Project characteristics		**4.51**	**9**									
Size of project	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Completion period	185	4.75	2	66	4.74	2	98	4.76	2	21	4.71	2
Location of project	185	4.67	3	66	4.67	3	98	4.67	3	21	4.67	3
Project cash flow	185	4.23	4	66	4.23	4	98	4.23	4	21	4.24	4

Table 4.15c: The barriers hindering the optimum selection of contractors

	Overall			Builder			Architect			Quantity S.		
Barriers	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Complexity of project	185	3.91	5	66	3.89	5	98	3.92	5	21	3.95	5
Political influence		**4.48**	**10**									
Fraudulent practices	185	4.67	1	66	4.68	1	98	4.67	1	21	4.62	2
Poor collaboration within stakeholders	185	4.66	2	66	4.65	2	98	4.67	1	21	4.67	1
Bureaucracy in tendering procedure	185	4.65	3	66	4.64	3	98	4.67	1	21	4.62	2
Fraudulent kickbacks and inducements	185	4.42	4	66	4.42	4	98	4.41	4	21	4.48	4
Social and cultural practices	185	4.01	5	66	4.05	5	98	3.97	5	21	4.10	5
Availability of resources		**4.41**	**11**									
Inadequate labour availability	185	4.68	1	66	4.68	1	98	4.67	1	21	4.67	1
Incorrect planning	185	4.67	2	66	4.68	2	98	4.67	1	21	4.62	2
Insufficient budget allocation	185	4.26	3	66	4.26	3	98	4.24	3	21	4.33	3
Plant and equipment allocation	185	4.01	4	66	3.98	4	98	4.00	5	21	4.14	4
Company related issues		**4.39**	**12**									
General overheads	185	4.67	1	66	4.68	1	98	4.67	1	21	4.62	2
Tax liability	185	4.59	2	66	4.62	2	98	4.56	2	21	4.67	1
Requirement of bond capacity	185	4.50	3	66	4.48	3	98	4.50	3	21	4.52	3
Mode of financing bond	185	4.34	4	66	4.35	4	98	4.34	4	21	4.29	4
Mode of financing payment	185	3.84	5	66	3.86	5	98	3.80	5	21	4.00	5
Contractors length of time in business		**4.39**	**12**									
Scope of project	185	4.92	1	66	4.92	1	98	4.91	1	21	4.95	1
Company stability	185	4.84	2	66	4.85	2	98	4.84	2	21	4.81	2
Capacity of work	185	4.34	3	66	4.35	3	98	4.33	3	21	4.38	3
Depth of organization	185	4.08	4	66	4.09	4	98	4.06	4	21	4.14	4
Value of project executed in the last five year	185	3.75	5	66	3.74	5	98	3.71	5	21	3.90	5
Economic situation		**4.38**	**14**									
Overall national economic performance	185	4.84	1	66	4.85	1	98	4.84	1	21	4.81	1

Table 4.15d: The barriers hindering the optimum selection of contractors

	Overall			Builder			Architect			Quantity S.		
Barriers	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Availabilty of projects	185	4.66	2	66	4.67	2	98	4.67	2	21	4.62	2
Anticipated rate of return on project	185	4.41	3	66	4.39	3	98	4.43	3	21	4.38	3
Project financing	185	4.18	4	66	4.20	4	98	4.14	4	21	4.29	4
Risk involved in the project	185	3.82	5	66	3.82	5	98	3.83	5	21	3.81	5
Influence of external forces or cartels		**4.29**	**15**									
Collusion by contractors to weaken selection process	185	4.92	1	66	4.92	1	98	4.92	1	21	4.90	1
Formation of interest group	185	4.75	2	66	4.76	2	98	4.74	2	21	4.76	2
Interference of higher interest authority on preffered candidate	185	4.02	3	66	4.05	3	98	4.01	3	21	3.95	3
Political interest	185	3.50	4	66	3.53	4	98	3.53	4	21	3.29	4

* M.S: Mean Score; N: Total
(Source: Author's Survey, 2019)

From table 4.15, 4.15a-4.15d, it can be seen that all the factors are very much relevant and important to be tackled in order to have an optimum selection of contractors; this is because all the factors are above the 2.5 average score for high level of agreement. However, it can be seen by ranks that the Use of fictitious document by contractors (Ranked 1st), Prequalification of consultants (2nd), and Tender price and estimates (3rd), are of foremost priority with respect to the barriers hindering the optimum selection of contractors by professionals in the Nigerian construction industry.

The responses of the participants as presented in Tables 4.6, 4.6a and 4.7 respectively further supported the quantitative narratives on the barriers to the optimum selection of contractors in the study area. The various narratives of the respondents' response from the interview showed similarity; and the outcome from the coding reveals that respondents' interview response further aligned with the quantitative analysis above. Most of the responses indicated that Use of

fictitious documents by contractors, undue interference from higher authorities and Political Influence are the hindrances to optimum selection of contractors for the delivery of building projects.

This is in consonance with some of the barriers identified in the study by Olatunji (2008) in a review on the barriers to the selection of contractors; which includes but not limited to misinformation of assessors on the technical capacities of contractors as most times prefabricated list and credentials are presented; lack of proper presentation by contractors despite their excellent performance records; lack of updated company profiles, information required for prequalification and the vulnerability of paper based prequalification; and cartel formation in public contracts as connivance is found amongst contractors which weakens the competition process.

4.3.4 Factors considered in theSelection of contractors

Table 4.16: The Factors Considered in theSelection of Contractors

	Overall			builder			Architect			Quantity S.		
Factors	**N***	**M.S***	**Rank**	**N**	**M.S**	**Rank**	**N**	**M.S**	**Rank**	**N**	**M.S**	**Rank**
Experience		**4.58**	**1**									
Experience over the last five years	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Current projects	185	4.58	2	66	4.58	2	98	4.59	2	21	4.57	3
Completed Projects	185	4.58	2	66	4.58	2	98	4.57	3	21	4.62	2
Labour familiarity	185	4.50	4	66	4.48	4	98	4.51	4	21	4.52	4
Market familiarity	185	4.43	5	66	4.45	5	98	4.42	5	21	4.38	5
Financial Capability		**4.39**	**2**									
Financial stability	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Credit rating	185	4.75	2	66	4.76	2	98	4.73	2	21	4.81	1
Turnover	185	4.41	3	66	4.39	3	98	4.43	3	21	4.33	3

Banking arrangement	185	4.16	4	66	4.15	5	98	4.15	5	21	4.24	4
Working capital	185	4.16	4	66	4.17	4	98	4.17	4	21	4.10	5

Table 4.16a: The Factors Considered in the Selection of Contractors

	Overall			**builder**			**Architect**			**Quantity S.**		
Factors	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Liquidity ratio	185	4.01	6	66	4.03	6	98	3.98	6	21	4.10	5
Technical Capability		**4.27**	**3**									
Previous experience on similar type of projects completed	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Previous experience on similar size of projects completed	185	4.75	2	66	4.74	2	98	4.76	2	21	4.76	2
Qualification of technical staff	185	4.42	3	66	4.39	3	98	4.42	3	21	4.48	3
Work programme	185	4.17	4	66	4.18	4	98	4.15	4	21	4.19	4
Experience of Technical staff	185	4.01	5	66	3.98	5	98	4.01	5	21	4.05	5
Method statement	185	3.31	6	66	3.24	6	98	3.35	6	21	3.38	6
Past relationship with client and others		**3.84**	**4**									
Relationship with client	185	4.26	1	66	4.44	1	98	4.24	1	21	3.81	1
Degree of contractor cooperation with stakeholders	185	3.92	2	66	4.12	2	98	3.92	2	21	3.29	2
Relationship with employees	185	3.78	3	66	3.94	3	98	3.81	3	21	3.19	4
Relationship with sub-contractors	185	3.65	4	66	3.71	5	98	3.71	4	21	3.19	4
Relationship with consultants	185	3.60	5	66	3.76	4	98	3.56	5	21	3.29	2
Reputation		**3.51**	**5**									
Past Project failure	185	3.84	1	66	3.79	1	98	3.94	1	21	3.57	1
Number of previous completed project	185	3.48	2	66	3.42	2	98	3.58	2	21	3.14	2
Records of claims and contractual disputes	185	3.44	3	66	3.35	4	98	3.56	3	21	3.14	2
Organization maturity	185	3.43	4	66	3.36	3	98	3.54	4	21	3.10	4
Litigation	185	3.34	5	66	3.27	5	98	3.45	5	21	3.00	5
Past failures		**3.49**	**6**									

Previous failure to successfully complete project	185	3.82	1	66	4.17	1	98	3.64	1	21	3.57	1

Table 4.16b: The Factors Considered in the Selection of Contractors

	Overall			builder			Architect			Quantity S.		
Factors	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Past and present experience reporting legal status	185	3.46	2	66	3.94	2	98	3.21	3	21	3.10	4
Financial penalties previously levied on failed contracts	185	3.41	3	66	3.79	4	98	3.21	3	21	3.14	2
Contracts not renewed due to failure	185	3.39	4	66	3.80	3	98	3.20	5	21	3.00	5
Contracts terminated	185	3.37	5	66	3.64	5	98	3.23	2	21	3.14	2
Personnel capability		**3.40**	**7**									
Availability of first line supervisor	185	3.67	1	66	3.92	1	98	3.52	1	21	3.57	1
Technical expertise of craftsman	185	3.40	2	66	3.89	2	98	3.12	2	21	3.14	2
Training and skilled level of craftsman	185	3.35	3	66	3.77	4	98	3.11	3	21	3.14	2
Availability of skilled craftsmen	185	3.34	4	66	3.79	3	98	3.09	4	21	3.10	4
Credibility of key staff	185	3.24	5	66	3.55	5	98	3.08	5	21	3.00	5
Project Management organization		**3.29**	**8**									
Planning and programming	185	3.63	1	66	3.54	1	98	3.71	1	21	3.57	1
Past project management performance	185	3.29	2	66	3.17	3	98	3.39	2	21	3.14	2
Adequate material control	185	3.21	3	66	3.20	2	98	3.27	4	21	3.14	3
Site organization	185	3.18	4	66	3.15	4	98	3.26	5	21	3.10	4
Experience and completion of project on schedule	185	3.16	5	66	2.98	5	98	3.31	3	21	3.00	5
Management Capability		**3.28**	**9**									
Past management performance	185	3.59	1	66	3.55	1	98	3.62	1	21	3.57	2
Current workload and capability	185	3.43	2	66	3.12	2	98	3.60	2	21	3.62	1
Qualification of project manager	185	3.15	3	66	3.05	5	98	3.22	3	21	3.10	4

Experience of management staff	185	3.14	4	66	3.12	2	98	3.15	4	21	3.14	3
Experience of level project manager	185	3.08	5	66	3.06	4	98	3.10	5	21	3.00	5

Table 4.16c: The Factors Considered in the Selection of Contractors

	Overall			builder			Architect			Quantity S.		
Factors	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Organization Culture		**3.25**	**10**									
Familiarity with local working culture	185	3.59	1	66	3.67	1	98	3.55	1	21	3.57	1
Contractor's familiarity with weather conditions	185	3.20	2	66	3.20	5	98	3.21	2	21	3.14	2
Experience within the location	185	3.17	3	66	3.21	4	98	3.14	3	21	3.14	2
Contractor familiarity with local suppliers	185	3.15	4	66	3.24	2	98	3.09	4	21	3.10	4
Familiarity with regulatory authority	185	3.13	5	66	3.24	2	98	3.08	5	21	3.00	5
Plant and Equipment		**3.25**	**10**									
Availability of contractor owned equipment	185	3.62	1	66	3.58	1	98	3.59	1	21	3.86	1
Ability to operate and maintain equipment	185	3.19	2	66	3.15	2	98	3.18	2	21	3.33	3
Adequacy of plant and equipment	185	3.17	3	66	3.14	4	98	3.13	3	21	3.43	2
Plant and equipment holding	185	3.15	4	66	3.15	2	98	3.13	3	21	3.19	5
Availability of suitable tools and equipment	185	3.12	5	66	3.11	5	98	3.10	5	21	3.29	4
Quality control and assurance		**3.24**	**12**									
Operational procedure	185	3.59	1	66	3.71	1	98	3.52	1	21	3.57	1
Productivity improvement program	185	3.19	2	66	3.32	2	98	3.11	2	21	3.14	2
Procedures for inspection of work in progress	185	3.17	3	66	3.27	3	98	3.11	2	21	3.14	2
Work quality record	185	3.15	4	66	3.26	4	98	3.08	4	21	3.10	4
Compliance with specification	185	3.10	5	66	3.17	5	98	3.08	4	21	3.00	5
Health and Safety Capability		**3.22**	**13**									

Health, safety and environmental plan	185	3.56	1	66	3.56	1	98	3.55	1	21	3.57	1
Company insurance policy	185	3.16	2	66	3.14	2	98	3.18	2	21	3.14	2
Safety record	185	3.15	3	66	3.14	2	98	3.16	3	21	3.14	2

Table 4.16d: The Factors Considered in the Selection of Contractors

	Overall			builder			Architect			Quantity S.		
Factors	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Management safety policy	185	3.11	4	66	3.09	5	98	3.13	4	21	3.10	4
Experience in handling dangerous substance	185	3.10	5	66	3.11	4	98	3.12	5	21	3.00	5
Past performance and quality		**3.22**	**13**									
Quality of workmanship	185	3.57	1	66	3.61	1	98	3.57	1	21	3.58	1
Past performance rating	185	3.17	2	66	3.21	2	98	3.14	2	21	3.20	3
Completion and quality Assurance Certificate	185	3.16	3	66	3.19	3	98	3.14	2	21	3.21	2
Quality control programme	185	3.11	4	66	3.16	4	98	3.10	4	21	3.15	4
Quality level (aesthetics, confidence in design)	185	3.10	5	66	3.14	5	98	3.00	5	21	3.07	5
Management knowledge		**3.19**	**15**									
Scheduling cost control system	185	3.53	1	66	3.54	1	98	3.53	1	21	3.57	1
Risk Responsibilities	185	3.17	2	66	3.18	2	98	3.16	2	21	3.14	2
Risk avoidance	185	3.15	3	66	3.12	3	98	3.16	2	21	3.14	2
Material and Purchasing Control	185	3.08	4	66	3.07	4	98	3.06	5	21	3.10	4
Procurement method	185	3.03	5	66	2.95	5	98	3.07	4	21	3.00	5

From tables 4.16, 4.16a-4.16d, it was observed that the outcome of the professionals' view on the factors considered in theselection of contractorsin the study area were in agreement that all the factors are very important to be considered in order to have an optimum selection of contractors; this is because all the factors scored above the 2.5 average score for high level of agreement. However, it can be seen by ranks that the professionals were of the view that Experience (Ranked 1st), Financial Capability (2nd), and Technical Capability (3rd), are the foremost factors that are usually considered in the selection of contractors in the Nigerian construction industry.

The responses of the participants in the interview as presented in Tables 4.8, 4.9, 4.10 respectively further supports the quantitative narratives on the factors considered in theselection of contractorsin the study area. The various narratives of the respondents' response from the interview showed similarity; and the outcome from the coding reveals that the responses further aligned with the quantitative analysis above. Most of the responses indicated that Technical capability, Experience, and Financial capability are the factors considered in the selection of contractorsin the study area.

This study agrees with the study by Rashvand*et al.*(2015) which outlined financial standing as the most important criterion followed by technical ability and management capability. Also Jiya (2012) concluded that the technical capacity was foremost, followed by financial capacity and reputation. It is pertinent to say that the factors considered in the selection of contractors are interrelated to a certain extent, since some of them can be affected by one another.

4.3.5 Critical Success Factors (CSFs) For Project Delivery

Table 4.17: The Critical Success Factors (CSF) for project delivery

	Overall			Builder			Architect			Quantity S.		
CSF	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Procurement related factors		**4.65**	**1**									
Methods of material procurement	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Tendering method	185	4.67	2	66	4.68	2	98	4.65	2	21	4.71	2
Effective contract administration	185	4.59	3	66	4.61	3	98	4.58	4	21	4.62	3
Contracting method	185	4.59	3	66	4.61	3	98	4.59	3	21	4.52	4
Clear and detailed procurement process	185	4.41	5	66	4.39	5	98	4.43	5	21	4.33	5
Project stakeholders related factors		**4.59**	**2**									
Removing obstacles	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Dealing with community issues	185	4.75	2	66	4.74	2	98	4.74	2	21	4.81	1

Table 4.17a: The Critical Success Factors (CSF) for project delivery

	Overall			Builder			Architect			Quantity S.		
CSF	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Engagement of external stakeholders	185	4.51	3	66	4.52	3	98	4.51	3	21	4.48	3
Frequent progress meetings	185	4.49	4	66	4.48	4	98	4.51	3	21	4.43	4
Adequate capture of stakeholders requirements	185	4.41	5	66	4.41	5	98	4.41	5	21	4.43	4
Daily site factors		**4.55**	**3**									
Contractors' ability to interpret designs	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Adequate finance for daily activities	185	4.75	2	66	4.74	2	98	4.74	2	21	4.76	2
Site welfare	185	4.50	3	66	4.50	3	98	4.50	3	21	4.52	3
Leadership skills of the project manager	185	4.26	4	66	4.26	4	98	4.26	5	21	4.29	4
Project plans and schedules	185	4.24	5	66	4.21	5	98	4.27	4	21	4.24	5
Contractor resource availability factors		**4.55**	**3**									
Prompt allocation of sufficient resources	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Response to instruction	185	4.67	2	66	4.67	2	98	4.67	2	21	4.67	2
Plant resources availability	185	4.43	3	66	4.45	3	98	4.38	4	21	4.57	3
Construction method	185	4.41	4	66	4.41	4	98	4.42	3	21	4.38	5
Plant and equipment holding	185	4.26	5	66	4.27	5	98	4.22	5	21	4.43	4
Managerial related factors		**4.55**	**3**									
Division of responsibility	185	4.92	1	66	4.92	1	98	4.92	1	21	4.90	1
Co-ordination of site welfare	185	4.67	2	66	4.67	2	98	4.66	2	21	4.71	2
Organization expertise	185	4.43	3	66	4.44	3	98	4.39	4	21	4.57	3
Technical alternatives	185	4.42	4	66	4.41	4	98	4.42	3	21	4.48	4
Attention to site safety	185	4.33	5	66	4.33	5	98	4.34	5	21	4.29	5
Adequate planning factors		**4.53**	**6**									
Valid realistic timescale	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Clearly documented project milestones & deliverables	185	4.67	2	66	4.68	2	98	4.66	2	21	4.67	2
Prompt allocation of resources	185	4.59	3	66	4.59	3	98	4.57	3	21	4.67	2
Production of accurate cost estimates	185	4.42	4	66	4.44	4	98	4.42	1	21	4.38	4

Table 4.17b: The Critical Success Factors (CSF) for project delivery

	Overall			Builder			Architect			Quantity S.		
CSF	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Detailed resource requirements	185	4.15	5	66	4.12	5	98	4.18	5	21	4.10	5
Local factors		**4.53**	**6**									
Location of company	185	4.91	1	66	4.91	1	98	4.92	1	21	4.90	1
Understanding the local language	185	4.58	2	66	4.59	2	98	4.59	2	21	4.52	2
Familiarity with location of project	185	4.50	3	66	4.52	3	98	4.50	3	21	4.48	3
Familiarity with local labour	185	4.42	4	66	4.41	4	98	4.42	4	21	4.43	4
Familiarity with weather conditions	185	4.25	5	66	4.24	5	98	4.24	4	21	4.29	5
Project risk related factors		**4.50**	**8**									
Compliance to environment standards	185	5.00	1	66	5.00	1	98	5.00	1	21	5.00	1
Risk control	185	4.83	2	66	4.83	2	98	4.83	3	21	4.86	2
Effective security	185	4.83	2	66	4.83	2	98	4.84	2	21	4.81	3
Limited or no restiveness	185	4.43	4	66	4.41	4	98	4.42	5	21	4.57	4
Risk response plan	185	3.42	5	66	3.44	5	98	3.39	5	21	3.48	5
Project management factors		**4.48**	**9**									
Commitment to project	185	4.66	1	66	4.67	1	98	4.67	1	21	4.62	1
Strong monitoring and evaluation system	185	4.51	2	66	4.55	2	98	4.51	2	21	4.43	3
Effective communication management	185	4.50	3	66	4.50	3	98	4.51	2	21	4.48	2
Effectiveness of coordination & integration of project activities	185	4.42	4	66	4.44	4	98	4.42	4	21	4.38	4
Effective project scheduling & budgeting	185	4.33	5	66	4.32	5	98	4.33	5	21	4.38	4
Technical related factors		**4.43**	**10**									
Appropriate Method statement	185	4.92	1	66	4.92	1	98	4.92	1	21	4.90	1
Availability of suitable equipment	185	4.59	2	66	4.61	2	98	4.57	2	21	4.62	2
Effective operational procedure	185	4.50	3	66	4.48	3	98	4.51	3	21	4.48	3
Availability of key personnel	185	4.40	4	66	4.38	4	98	4.43	4	21	4.33	4
Level of technology	185	3.75	5	66	3.76	5	98	3.73	5	21	3.81	5

Table 4.17c: The Critical Success Factors (CSF) for project delivery

	Overall			Builder			Architect			Quantity S.		
CSF	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Incentive related factors		**4.42**	**11**									
Reward for integrity and commitment	185	4.76	1	66	4.77	1	98	4.76	1	21	4.71	1
Regular payment of workers salary	185	4.75	2	66	4.74	2	98	4.76	1	21	4.71	1
Promoting good handlers	185	4.59	3	66	4.62	3	98	4.55	3	21	4.71	1
Giving bonuses to workers	185	4.16	4	66	4.15	4	98	4.16	4	21	4.19	4
Ability to work as a team	185	3.85	5	66	3.89	5	98	3.81	5	21	3.90	5
Performance related factors		**4.39**	**12**									
Quality Assurance	185	4.92	1	66	4.92	1	98	4.92	1	21	4.90	1
Quality management	185	4.50	2	66	4.50	2	98	4.51	2	21	4.48	3
Evidence of timely delivery of projects	185	4.43	3	66	4.42	3	98	4.42	3	21	4.52	2
Flexibility of management	185	4.34	4	66	4.33	4	98	4.34	4	21	4.38	4
Quality control	185	3.77	5	66	3.76	5	98	3.76	5	21	3.86	5
Quality and standard factors		**4.39**	**12**									
Standard workmanship	185	4.99	1	66	5.00	1	98	4.99	1	21	5.00	1
Technical competence	185	4.75	2	66	4.73	2	98	4.76	2	21	4.76	2
Ability to formulate program	185	4.25	3	66	4.24	3	98	4.23	3	21	4.38	3
Ability to remedy defect timely	185	4.02	4	66	4.03	4	98	3.98	4	21	4.19	4
Quality of materials procured	185	3.92	5	66	3.89	5	98	3.90	5	21	4.14	5
Realistic estimates of schedule and cost		**4.39**	**12**									
Labour rates	185	4.83	1	66	4.83	1	98	4.84	1	21	4.81	1
Contractor Overheads	185	4.50	2	66	4.48	2	98	4.51	2	21	4.52	2
Material rates	185	4.42	3	66	4.44	3	98	4.41	3	21	4.43	3
Unit price	185	4.16	4	66	4.12	4	98	4.18	4	21	4.19	4
Builders work	185	4.07	5	66	4.05	5	98	4.08	5	21	4.10	5
External factors		**4.34**	**15**									
Economic environment	185	4.83	1	66	4.82	1	98	4.84	1	21	4.81	1

Table 4.17d: The Critical Success Factors (CSF) for project delivery

	Overall			Builder			Architect			Quantity S.		
CSF	N*	M.S*	Rank	N	M.S	Rank	N	M.S	Rank	N	M.S	Rank
Political environment	185	4.66	2	66	4.65	2	98	4.67	2	21	4.62	2
Familiarity with weather conditions	185	4.23	3	66	4.21	3	98	4.27	3	21	4.14	4
Social environment	185	4.09	4	66	4.09	4	98	4.06	4	21	4.19	3
Administrative approvals	185	3.91	5	66	3.92	5	98	3.91	5	21	3.90	5

* M.S: Mean Score; N: Total
(**Source**: Author's Survey, 2019)

From table 4.17, 4.17a-4.17d, the professionals were in agreement that all the factors are very much crucial in the successful delivery of projects; this is because all the factors scored well above the 2.5 average score.Thus giving a very high level of agreement. However, it can be seen by ranks that the professionals were of the view that Procurement related factors (Ranked 1st), Project stakeholders related factors (2nd), and Daily site factors (3rd), are the most critical factors that can always lead to the successful delivery of projects in the study area.

Table 4.10 and 4.11 shows the interview response on the critical success factors for project delivery among organisation. Respondents' responses as shown in the interview validate the information from quantitative data. Generally, the participants noted that the critical success factors for project delivery crucially rely on completion period and achieving the value for money. The variousresponses from the interview showed similarity; and the outcome from the coding aligned with the quantitative analysis above. The participants' view which is based on completion period and achieving the value for money, adequately relates to the procurement and adequate planning factors which are foremost in the outcome of the questionnaire study.

Procurement related factors namely method of material procurement, tendering methods,effective contract administration, clear and detailed procurement process are critical

factors in successful delivery of project which is in consonance with the works of Tan and Gazali (2013);Adnan *et al*. (2014) that opined three (3) attributes used to measure procurement related factors., these attributes are the procurement method (selection of the organization for the design and construction of the project), tendering method (procedures adopted for the selection of the project team and in particular the main contractor) and contracting mechanism

Haughey (2014) also revealed that the Adequate planning factors is a critical factor for success because it provides the following benefits; Clearly documented project milestones and deliverables; valid and realistic timescale; allows accurate cost estimates to be produced; detailed resource requirements; acts as an early warning signal, providing visibility of task slippage; and keeps the project team focused, while keeping vigil with the progress of the project. It is also pertinent to say that the selection of the organization for the design and construction of the projects, procedures adopted for the selection of the project team and in particular the main contractor) and contracting mechanism, have direct effects on the completion period and achieving value for money. This reflects that the Procurement related factors, project stakeholderand daily site factors have serious contributory roles to the successful delivery of projects in the Nigerian construction industry.

4.3.6 Relationship between the Factors used in Contractor Selection and the Critical Success Factors (CSF) for Project Delivery

4.19: Factor Analysis for Factors Considered in the Selection of Contractors

Table 4.18: The importance of variables

Communalities		
	Initial	Extraction
Technical Capability	1.000	.649
Financial Capability	1.000	.407
Health and Safety Capability	1.000	.660
Reputation	1.000	.446
Management Capability	1.000	.579

Table 4.18a: The importance of variables

Communalities		
	Initial	Extraction
Organisational Culture	1.000	.518
Experience	1.000	.719
Project Management Organisation	1.000	.640
Management Knowledge	1.000	.576
Plant and Equipment	1.000	.757
Past Failure	1.000	.655
Past Performance and Quality	1.000	.647
Personnel Capability	1.000	.619
Quality Control and Assurance	1.000	.491
Past Relationship with client and others	1.000	.904

(Source: Author's Survey, 2019)

The relationship between the factors used in contractor selection and the critical success factors (CSF) for project delivery in the study area was tested using the factor analysis and the canonical correlation. Since the factors used in contractor selection and the critical success factors (CSF) for project delivery are independent set of factors, the factor analysis was carried out separately and their relationship tested successively.

As shown in Table 4.18 and 4.18a, the communalities, which can be regarded as indications of the importance of the variables in the analysis, are generally high above 50. This shows that the variables, selected apart from financial capacity (40.7) and Reputation (44.6) for this study are appropriate and relevant in the selection of contractors.

Table 4.19: Eigen value extraction

Total Variance Explained									
	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.887	19.247	19.247	2.887	19.247	19.247	2.128	14.185	14.185
2	1.748	11.652	30.898	1.748	11.652	30.898	2.023	13.485	27.670
3	1.318	8.785	39.684	1.318	8.785	39.684	1.601	10.672	38.342
4	1.226	8.171	47.855	1.226	8.171	47.855	1.277	8.513	46.855

Table 4.19a: Eigenvalue extraction

Total Variance Explained

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
5	1.089	7.258	55.113	1.089	7.258	55.113	1.171	7.804	54.659
6	1.000	6.669	61.782	1.000	6.669	61.782	1.069	7.123	61.782
7	.923	6.155	67.938						
8	.785	5.231	73.169						
9	.736	4.905	78.074						
10	.686	4.574	82.648						
11	.627	4.179	86.827						
12	.602	4.016	90.843						
13	.507	3.382	94.225						
14	.436	2.907	97.131						
15	.430	2.869	100.000						

(Source: Author's Survey, 2019)

From Tables 4.19 and 4.19a, the factor analysis procedures with Varimaxrotation applied to the data yielded a six-dimensional solution (Extracted factors). This was done using the Eigen value of not less than one for the extraction. The six factors which altogether accounted for 61.78% of the total variance in the 15 original variables may be regarded composite indicators defining factors for the selection of contractors.

Table 4.20: The factor analysis (Varimax with Kaiser Normalization)

Rotated Component Matrix

	Component					
	1	**2**	**3**	**4**	**5**	**6**
Technical Capability	-.029	-.058	.210	**.752**	.184	-.028
Financial Capability	-.077	.084	-.624	.032	-.026	.052
Health and Safety Capability	.307	**.700**	-.203	-.055	-.118	-.135
Reputation	**.579**	-.110	.174	.046	-.120	.228
Management Capability	-.005	.313	**.686**	.047	.029	-.087
Organisational Culture	.020	**.686**	.127	.009	-.123	.127
Experience	-.018	.055	-.197	**.816**	-.099	-.010
Project Management Organisation	-.045	**.541**	.231	-.082	**.530**	.062
Management Knowledge	.258	.225	**.632**	.006	-.121	.213
Plant and Equipment	.025	-.075	-.092	.091	**.856**	.023

Table 4.20a: The factor analysis (Varimax with Kaiser Normalization)

Rotated Component Matrix

	Component					
	1	**2**	**3**	**4**	**5**	**6**
Past Failure	**.788**	.022	-.014	.060	.088	-.147
Past Performance and Quality	.031	**.733**	.254	.056	.199	.038
Personnel Capability	**.768**	.143	-.021	-.082	.041	-.009
Quality Control and Assurance	**.638**	.161	.208	-.076	-.032	.091
Past Relationship with client and others	.055	.074	-.039	-.037	.055	**.943**

(Source: Author's Survey, 2019)

Interpretation:

Factor 1: Personnel Reputation and Assurance

Tables4.20 and 4.20a revealed that this factor accounted for 14.19% of the total variance and it is without doubt the most important factor. Out of the 15 variables, four variables loaded positively strong on this factor. They include Reputation, past failure, personnel capacity, Quality Control and Assurance.

Factor 2: Organisational Safety and Performance

This factor accounted for 13.49% of the total variance. It includes variables such as Health and Safety, Project Management Organisation, Organisational Culture, and Performance and Quality.

Factor 3: Managerial Knowledge

This factor includes Management capacity and Management Knowledge. It accounted for 10.67% of the total variance in the dataset.

Factor 4: Technical Experience

This factor accounted for 8.51% of the total variance. Two variables out of the original 15 variables loaded positive on this factor which are Technical Capacity and Experience. Hence, it was named Technical Experience.

Factor 5: Project Management and Equipment

This factor loaded positive on two variables which accounted for 7.8% of the total variance. The two variables include Project Management Organisation, and Plant and Equipment.

Factor 6: Past Relationship with Client and Others

Only one variable loaded positively on this factor. This variable single-handedly accounted for 7.12% of the total variance. The dominance of Past Relation with Client and others was used to name this factor. The relative importance of the factors considered for selection of contractors is shown by their Eigen values, which indicated that factor one is more important followed by factor two and so on.

4.3.7 Factor Analysis for Critical Success Factors (CSF) For Project Delivery

Table 4.21: The importance of variables

Communalities		
	Initial	Extraction
Project Management	1.000	.941
Adequate Planning	1.000	.836
Procurement related	1.000	.882
External Factor	1.000	.884
Project Stakeholder	1.000	.885
Daily Site	1.000	.921
contractor Resources availability	1.000	.944
Project risk related	1.000	.782
Performance related	1.000	.957
incentive related	1.000	.934
Managerial Related	1.000	.924
Technical related	1.000	.831
Quality and Standard related	1.000	.941
Location Factor	1.000	.951
Realistic estimated cost and schedules in terms of labour rate	1.000	.965

(Source: Author's Survey, 2019)

As shown in Table 4.21, the communalities, which can be regarded as indications of the importance of the variables in the analysis, are generally high above 50. This shows that the

variables selected for this study are appropriate and relevant for critical success factors for project delivery.

Table 4.22: Eigenvalue extraction

Total Variance Explained

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.065	20.434	20.434	3.065	20.434	20.434	2.608	17.388	17.388
2	2.920	19.465	39.898	2.920	19.465	39.898	2.569	17.125	34.512
3	2.724	18.159	58.058	2.724	18.159	58.058	2.520	16.803	51.316
4	2.252	15.013	73.071	2.252	15.013	73.071	2.435	16.232	67.548
5	1.444	9.626	82.697	1.444	9.626	82.697	1.859	12.391	79.939
6	1.173	7.823	90.520	1.173	7.823	90.520	1.587	10.581	90.520
7	.600	4.000	94.520						
8	.473	3.152	97.672						
9	.182	1.215	98.888						
10	.122	.816	99.704						
11	.044	.295	99.999						
12	.000	.001	100.000						
13	1.115E-15	7.434E-15	100.000						
14	4.434E-16	2.956E-15	100.000						
15	-1.594E-15	-1.063E-14	100.000						

(Source: Author's Survey, 2019)

From Table 4.22, the factor analysis procedures with Varimaxrotation applied to the data yielded a six-dimensional solution (Extracted factors). This was done using the Eigen value of not less than one for the extraction. The six factors which altogether accounted for 90.52% of the total variance in the 15 original variables may be regarded composite indicators defining critical success factors (CSFs) for project delivery.

Table 4.23: The factor analysis (Varimax with Kaiser Normalization)

Rotated Component Matrix						
	Component					
	1	2	3	4	5	6
Project Management	.146	-.092	-.083	-.175	**.925**	-.131
Adequate Planning	.047	**.891**	.063	.153	.008	-.110
Procurement related	.440	**.636**	-.056	.020	-.158	-.506
External Factor	.060	-.017	-.063	.088	-.218	**.906**
Project Stakeholder	-.890	.056	-.072	-.098	-.275	-.003
Daily Site	-.147	.001	**.942**	-.088	-.030	-.053
contractor Resources availability	.437	-.346	-.069	**.762**	-.216	.007
Project risk related	.026	-.002	.216	**.843**	-.150	.026
Performance related	.123	-.318	**.609**	-.120	**.611**	-.285
incentive related	-.194	.353	-.125	**.856**	.088	.123
Managerial Related	.205	-.813	.136	.207	.332	-.221
Technical related	**.749**	-.118	-.261	-.089	.286	.313
Quality and Standard related	-.183	-.207	**.756**	**.496**	-.160	-.145
Location Factor	**.788**	.309	-.042	-.036	-.404	-.263
Realistic estimated cost and schedules in terms of labour rate	.270	.446	**.714**	.131	.147	.380

(Source: Author's Survey, 2019)

Interpretation:

Factor 1: Technical and Location Factor

Table 4.23 revealed that this factor accounted for 17.39% of the total variance and it is without doubt the most important factor. Out of the 15 variables, two variables loaded positively strong on this factor. They include Technical Related and Location Factor.

Factor 2: Planning and Procurement Factor

This factor accounted for 17.13% of the total variance. It includes variables such as Adequate Planning related and Procurement Related.

Factor 3: Standard and Estimated Cost Factor

This factor includes Daily Site, Performance Related, Quality and Standard Related, and Realistic Estimate Cost and Schedules in terms of Labour Rate. It accounted for 16.80% of the total variance in the dataset.

Factor 4: Contractors Resources and Risk Factor

This factor accounted for 16.23% of the total variance. Four variables out of the original 15 variables loaded positive on this factor which are Contractor Resources Availability, Project Risk, Incentives, and Quality and Standard Related. Hence, it was named Contractors Resources and Risk Factor.

Factor 5: Project Management and Performance

This factor loaded positive on two variables which accounted for 12.39% of the total variance. The two variables include Project Management Factor and Performance Related.

Factor 6: External Factor

Only one variable loaded positively on this factor. This variable single-handedly accounted for 10.58% of the total variance. The dominance of External Factor was used to name this factor.The relative importance of the critical success factors (CSFs) for project delivery is shown by their Eigen values, which indicated that factor one is more important followed by factor two and others.

4.3.8 Test of relationship between factors considered for the selection of contractors and critical success factor for project delivery

Table 4.24: Test for significance for canonical correlations variates

	Correlation	Eigen value	Wilks Statistic	F	Num D.F	Denom D.F.	Sig.
1	.704	.981	.259	7.617	36.000	762.457	.000
2	.602	.570	.514	5.083	25.000	647.883	.000
3	.411	.203	.807	2.432	16.000	535.271	.001
4	.151	.023	.971	.580	9.000	428.488	.814
5	.074	.006	.994	.288	4.000	354.000	.886
6	.031	.001	.999	.172	1.000	178.000	.679

(**Source:** Author's Survey, 2019)

Table 4.24 shows the test of significance of the linear combination of factors considered for the selection of contractors (X variates) and critical success factor in project Delivery (Y variates) with the aim of accounting for the maximum amount of correlation between the two sets of data X and Y. The result shows that the X and Y set of data were significant with the maximum number of six linear combination extracted with three of the combination significant at 0.05 level. The first linear combination was significant at 0.000, the second at 0.000 and the third significant at 0.001. The Table revealed that the first pair of linear combination between the three sets of data is quite high at 0.98. This decreased to 0.57 and 0.20 for the second and third sets of linear combination respectively. This shows that the first three pair linear combination share 98%, 57% and 20% of their variance respectively. Hence, there is a significant relationship between factor considered for the selection of contractors and critical success factors for project delivery. However, there is need to find out the factors responsible for the significant relationship among the variates; this led to the use of the canonical structure matrix as shown below.

Table 4.25: Canonical structure matrix for factor considered in selection of contractors and critical success factor for project delivery

X Factors	1	2	3
Personnel Reputation and Assurance	.027	.030	.028
Organisational Safety and Performance	.011	-.099	.093
Managerial Knowledge	.030	**.504**	-.153
Technical Experience	**-.676**	.036	.075
Project Management and Equipment	-.164	.116	-.128
Past Relationship With Client and Others	-.097	-.289	-.338
Y Factors	1	2	3
Technical and Location Factor	-.251	.200	-.212
Planning and Procurement Factor	-.155	-.363	-.046
Standard and Estimated cost Factor	**-.586**	.124	.037
Contractor Resources and Risk Factor	-.207	-.115	.053
Project Management and Performance	-.068	-.384	-.167
External Factor	.131	.123	-.300

(Source: Author's Survey, 2019)

Interpretation: Taking 0.5 as the cut- off point, result shows that Technical Experience, Standard and Estimated cost Factor, and Managerial Knowledge in the linear combination structure above is an indication that there is a relationship between factors considered for the selection of contractors and critical success factor for project delivery. Taking the first column of the linear combination extracted, it was revealed that predicted Technical Experience of the first dataset which has a canonical loading of -0.676 was related to Standard and estimated cost Factor in the CSFs with a loading of -0.586. Managerial Knowledge does not have strong relationship with any of the factor in the second dataset. The third linear combination has no clear-cut pattern of linkage.

The result shows that Technical experience and Standard and Estimated Cost factor were the two major factors making the major contribution to the observed relationship between factor considered in the selection of contractors and critical success factors for project delivery. Under the technical experience; the technical capacity and experience correlating strongly with

Standard and Estimated cost Factor which has Daily site, Performance related, Quality and Standard Related, and Realistic Estimated cost and Schedules in terms of Labour Rate.

This concludes that out of the six possible combinations of the factors, the relationship existing between them was found in three ways. Hence, there is a significant relationship between factors considered for the selection of contractors and critical success factors for project delivery in the study area. In seeking to find out the factors responsible for the significant relationship among the two independent set of factors, it was seen that Technical experience and Standard and Estimated Cost factor were the two major factors making the major contribution to the observed relationship between factor considered in the selection of contractors and critical success factors for project delivery. Under the Technical experience, the Technical capability and Experience is been captured to correlate strongly with Daily site factors, Performance related factors, Quality and Standard Related factors, and Realistic Estimated cost and Schedules in terms of Labour Rate which is captured under Standard and Estimated cost Factor.

Cheng and Choi (2004); Fong and Choi (200) in separate studies concluded that technical capability in terms of possession of specialist knowledge and deploying of adequate resources; overall experience, ability to work in new environment, labour recruitment process and rates significantly influences the selection process which is in consonance with this study.

4.3.9 Influence of contractor selection factor on critical success factor for project delivery

Table 4.26: Regression analysis of selection factors on technical and location factor

Coefficients						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			Remark
(Constant)	4.159E-16	.069		.000	1.000	
Personnel Reputation and Assurance	.011	.069	.011	.165	.869	Not significant
Organisational Safety and Performance	-.093	.069	-.093	-1.349	.179	Not Significant
Managerial Knowledge	.211	.069	.211	3.064	.003	significant
Technical Experience	.202	.069	.202	2.925	.004	significant
Project Management and Equipment	.222	.069	.222	3.213	.002	significant
Past Relationship with Client and Others	.098	.069	.098	1.426	.156	Not significant

(**Source:** Author's Survey, 2019)

On the significant level of P < 0.05 at 95% confidence level, managerial knowledge, technical experience, and project management and equipment statistically significant to technical and location factor while personnel reputation and assurance, organizational safety and performance, and past relationship with client and others are not significant. Project characteristics conditions and variables have tremendous impact on success of project when sustained and managed appropriately (Tan &Ghazali, 2011).

Table 4.27: Regression Analysis of Selection Factors on Planning and Procurement Factor

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Remark**
	B	**Std. Error**	**Beta**			
(Constant)	-2.840E-16	.068		.000	1.000	
Personnel Reputation and Assurance	.016	.068	.016	.228	.820	Not significant
Organisational Safety and Performance	.088	.068	.088	1.285	.201	Not significant
Managerial Knowledge	-.302	.068	-.302	-4.412	.000	significant
Technical Experience	.108	.068	.108	1.581	.116	Not significant
Project Management and Equipment	.037	.068	.037	.538	.591	Not significant
Past Relationship with Client and Others	.229	.068	.229	3.346	.001	significant

(**Source:** Author's Survey, 2019)

On the significant level of P < 0.05 at 95% confidence level, managerial knowledge, and past relationship with client and others are statistically significant to planning and procurement factor while personnel reputation and assurance, organizational safety and performance, technical experience, and project management and equipment are not significant. Division of responsibilities, organizational expertise, co-ordination of site welfare contribute positively to planning and procurement (Kog& Yan, 2014).

Table 4.28: Regression Analysis of Selection Factors on Standard and Estimated Cost Factor

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Remarks**
	B	**Std. Error**	**Beta**			
(Constant)	-6.407E-16	.060		.000	1.000	
Personnel Reputation and Assurance	-.044	.060	-.044	-.741	.460	Not significant
Organisational Safety and Performance	-.007	.060	-.007	-.118	.906	Not significant
Managerial Knowledge	.087	.060	.087	1.449	.149	Not significant
Technical Experience	.587	.060	.587	9.825	.000	Significant
Project Management and Equipment	.100	.060	.100	1.668	.097	Not significant
Past Relationship with Client and Others	.003	.060	.003	.057	.955	Not significant

(**Source:** Author's Survey, 2019)

On the significant level of P < 0.05 at 95% confidence level, technical experience only is statistically significant to standard and estimated cost factor while personnel reputation and assurance, organizational safety and performance, managerial knowledge, past relationship with client and others, and project management and equipment are not significant.

Table 4.29: Regression analysis of selection factors on contractors resources and risk factor

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Remarks**
	B	**Std. Error**	**Beta**			
(Constant)	3.225E-16	.072		.000	1.000	
Personnel Reputation and Assurance	.033	.072	.033	.462	.645	Not significant
Organisational Safety and Performance	-.023	.072	-.023	-.322	.748	Not significant
Managerial Knowledge	-.150	.072	-.150	-2.077	.039	Significant
Technical Experience	.197	.072	.197	2.713	.007	Significant
Project Management and Equipment	.039	.072	.039	.535	.593	Not significant
Past Relationship with Client and Others	.029	.072	.029	.401	.689	Not significant

(**Source:** Author's Survey, 2019)

On the significant level of P < 0.05 at 95% confidence level, managerial knowledge, and technical experience are statistically significant to contractors resources and risk factor while personnel reputation and assurance, organizational safety and performance, past relationship with client and others, and project management and equipment are not significant. Strong monitoring

and evaluation system, effective coordination, integration and project activities, effective project scheduling ensure effective project delivery (Saqib*et al*., 2008).

Table 4.30: Regression analysis of selection factors on project management and performance factor

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		**Remark**
(Constant)	1.898E-16	.067		.000	1.000
Personnel Reputation and Assurance	-.081	.068	-.081	-1.204	.230 Not significant
Organisational Safety and Performance	.002	.068	.002	.029	.977 Not significant
Managerial Knowledge	-.248	.068	-.248	-3.670	.000 Significant
Technical Experience	.023	.068	.023	.338	.736 Not significant
Project Management and Equipment	-.060	.068	-.060	-.885	.377 Not significant
Past Relationship with Client and Others	.337	.068	.337	4.988	.000 Significant

(**Source:** Author's Survey, 2019)

On the significant level of P < 0.05 at 95% confidence level, managerial knowledge, past relationship with client and others, are statistically significant to project management and performance factor while personnel reputation and assurance, organizational safety and performance, technical experience and project management and equipment are not significant. Project manager competence, decision making skills, quality management , flexibility of

management, evidence of timely delivery of project have strong influence on project delivery (Ogwueleka, 2011).

Table 4.31: Regression analysis of selection factors on external factor

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Remarks**
	B	**Std. Error**	**Beta**			
(Constant)	-1.429E-16	.070		.000	1.000	
Personnel Reputation and Assurance	-.003	.070	-.003	-.043	.966	Not Significant
Organisational Safety and Performance	-.082	.070	-.082	-1.166	.245	Not significant
Managerial Knowledge	.229	.070	.229	3.266	.001	Significant
Technical Experience	-.168	.070	-.168	-2.399	.017	Significant
Project Management and Equipment	.065	.070	.065	.924	.357	Not significant
Past Relationship with Client and Others	.176	.070	.176	2.504	.013	Significant

On the significant level of $P < 0.05$ at 95% confidence level, managerial knowledge, technical experience, and past relationship with client and others, are statistically significant to external factor while personnel reputation and assurance, organizational safety and performance,and project management and equipment are not significant. Economic, social, political,

administrative performance and familiarity with weather conditions improves project performance (Dolan, 2010).

4.4 Discussion of Major Findings

This section discusses the findings of the study with respect to the research questions outlined for the purpose of this study.

4.4.1 The Selection Criteria Process of Contractors

The responses of the professionals with regards to the selection criteria process of contractorsrevealed that the most utilised selection criteria process of contractors is the selective process, followed by competitive, and the negotiated process. In the various professionals' view, it was also observed that there are no statistical differences in the view that the above mentioned are the major processes used in the selection of contractors. The outcome from the interview also revealed that the Open Competitive and Selective Tendering system is mostly used by the participants for public projects delivery. This outcome is totally in agreement with a study by Plebankiewicz(2012) which confirmed that selection of a contractor for building works is complex and difficult hence correct preparation of the tender requirement and evaluation of tender process takes place at the early stage of the project life cycle which is most critical undertaking by the client. Watt, *et al. (*2010) opined that the open competitive process allowsflexibility in the tendering process client as it is open to all contractors. However, inappropriate contractors are removed from the list if the number of tenders becomes too large. Ashworth (2013) agreed that it is the duty of client to make public the availability of their projects to probable tenders. This study also agrees with the study by Bennett (2003) on the selective process of tendering;the study explained that the client describes the project briefly and then extends invitation to suitable candidates to apply for the project. When the general

announcement of this tender is made, the selection and bid documents are submitted simultaneously prior to the presentation date. The bidders will be assessed using the selection criteria and the bid with the award criteria.

4.4.2 The barriers hindering the optimum selection of contractors

The responses of the professionals with respect to the barriers hindering the optimum selection of contractorsin the study area disclosed that all the factors are very much relevant and important to be tackled in order to have an optimum selection of contractors. It was seen that the Use of fictitious document by contractors, Prequalification of consultants, Tender price and estimates, and Political influence were of foremost priority with respect to the barriers hindering the optimum selection of contractors by professionals in the Nigerian construction industry. The outcome from the interview also revealed that the Use of fictitious documents by contractors and Political Influence were the major hindrances to optimum selection of contractors for the delivery of building projects. This study agrees with the study by Olatunji (2008) in a review on the barriers to the selection of contractors; which includes but not limited to Misinformation of assessors on the technical capacities of contractors as most times prefabricated list and credentials are presented; lack of proper presentation by contractors despite their excellent performance records; lack of updated company profiles, information required for prequalification and the vulnerability of paper based prequalification; and cartel formation in public contracts as connivance is found amongst contractors which weakens the competition process.

4.4.3 The factors considered in the selection of contractors

The study on the factors considered in the selection of contractors confirmed that the professionals were in agreement that all the factors are very important to be considered in order to have an optimum selection of contractors. The professionals were of the view that Experience,

Financial Capability, and Technical Capability, are the foremost factors that are considered in the selection of contractors in the Nigerian construction industry. In the interview study, Technical capability, Experience, and Financial capability were also highly noted as some of the factors considered in theselection of contractors**.**

This study agrees with the study by Fong & Choi (2000) which outlined financial soundness, overall experience, technical capability and adequate organisational capacity as the most important criteria. Cheng and Heng (2004) affirmed that the technical capacity was foremost, followed by financial capacity and reputation. Doloi (2009) opined that technical expertise, deployment of adequate resources, success in past projects and sound programming are major attributes considered in assessment of contractors. In recent development, study by Othman (2016) also revealed that experience and financial stability was the most important group, followed by the reputation, technical and management stability; thus, aligning in agreement with this study.

It is pertinent to say that the factors considered in the selection of contractors are interrelated to a certain extent, since some of them can be affected by one another. For instance, good past experience may lead to good safety performance if the past experience includes good safety records. Good past performances and experiences is good evidence of successful projects, which in turn results in strong financial capability. Resources and financial capability may be positively correlated. Tender price may be negatively related to other criteria; however, in most studies of contractor selection, the factors considered in the selection of contractors are assumed to be independent of each

4.4.4 The critical success factors (CSFs) for project delivery

The professionals were in agreement that all the factors are very much crucial in the successful delivery of projects in the study area. However, it was seen that the professionals were of the view that Procurement related factors, Project stakeholders related factors, Daily site factors, and Adequate planning factors are the most critical factors that can always lead to the successful delivery of projects in the study area. This impresses the fact that the need for an optimum selection of contractors for the successful delivery of projects cannot be overemphasized; this is because the procurement related factors were of highest priority from the outcome. The organisations also gave that the critical success factors for project delivery crucially rely on completion period and achieving the value for money; this adequately relates to the procurement and adequate planning factors which were the foremost derived factors of the questionnaire study.

Akpan and Igwe (2001) in a study concluded that inadequate planning is the bane of unsuccessful projects in the Nigeria construction industry, Nasir and Sahibuddin(2011) asserted that lack of realistic tender prices, estimate of schedules and budget contributes to failure of most projects. Study by Moyane and Emuze (2015) identified human induced decision in Procurement Related Factors (methods material procurement, tendering methods, contracting methods and effective contract administration) as factors hindering effective project delivery. Consequently,Haughey (2014) stressed that the Adequate Planning Factors (documented project milestones and deliverables, valid and realistic timescale, detailed resource requirements) ensures the progress of the project. It is also pertinent to say that the selection of the organization for the design and construction of the projects, procedures adopted for the selection of the project team and in particular the main contractor and contracting mechanism have direct effects on the

completion period and achieving value for money. This reflects that the Procurement related factors have a serious contributory role to the successful delivery of projects in the Nigerian construction

4.4.5 The relationship between factors considered for the selection of contractors and critical success factor for project delivery

The test of significance of the linear combination of factors considered for the selection of contractors and critical success factor in project Delivery was carried out with the aim of accounting for the maximum amount of correlation between the two sets of data. The result showed that the two set of data were significant with the maximum number of six linear combination extracted and three of the combination were significant. This means that out of the six possible combinations of the factors, the relationship existing between them was found in three ways. Hence, there is a significant relationship between factors considered for the selection of contractors and critical success factors for project delivery. In seeking to find out the factors responsible for the significant relationship among the two independent set of factors, it was seen that Technical experience and Standard and Estimated Cost factor were the two major factors making the major contribution to the observed relationship between factor considered in the selection of contractors and critical success factors for project delivery. Under the Technical experience, the Technical capability and Experience is been captured to correlate strongly with Daily site factors, Performance related factors, Quality and Standard Related factors, and Realistic Estimated cost and Schedules in terms of Labour Rate which is captured under Standard and Estimated Cost Factor.

Significant level of $P < 0.05$ at 95% confidence level, managerial knowledge, technical experience, and past relationship with client and others, are statistically significant to external

factor while personnel reputation and assurance, organizational safety and performance, and project management and equipment are not significant. Economic, social, political, administrative performance and familiarity with weather conditions improves project performance (Dolan, 2010).

Significant level of $P < 0.05$ at 95% confidence level, managerial knowledge, past relationship with client and others, are statistically significant to project management and performance factor while personnel reputation and assurance, organizational safety and performance, technical experience and project management and equipment are not significant. Project manager competence, decision making skills, quality management , flexibility of management, evidence of timely delivery of project have strong influence on project delivery (Ogwueleka, 2011).

Significant level of $P < 0.05$ at 95% confidence level, managerial knowledge, and technical experience are statistically significant to contractors resources and risk factor while personnel reputation and assurance, organizational safety and performance, past relationship with client and others, and project management and equipment are not significant. Strong monitoring and evaluation system, effective coordination, integration and project activities, effective project scheduling ensure effective project delivery (Saqib*et al*., 2008).

This is in agreement with Doloi(2009)that concluded that technical expertise, success in past projects;financial soundness andadequate organisational capacity have significant influence in the selection process.Hossenni*et al. (*2016) in another study explored the relationship between selection criteria and concluded that there exists inter relationship between the various selection criteria since one criterion may exert on the others. Based on the relationship between selection criteria and success factors, there is need to adopt the selection criteria for each individual based

on project characteristics, client characteristics and external environment for effective project delivery.

4.5 Summary of Findings

This section discusses the findings of the study with respect to the research questions outlined for the purpose of this study.

a. The process of selecting a contractor is largely dependent on the tendering method adopted; the Selective and Open Competitive Tendering method is widely practiced.
b. The main objective of the client in the Contractor Selection Process is to select the most responsive contractor that is financially and technically stable in order to effectively deliver project with respect to time, cost and quality with minimal risk.
c. The process of contractor selection entails a set of subjective tendering procedures adopted by the client which involves invitation to tender (Advertisement), submission of completed tender by contractors, opening of bids, prequalification (where necessary), evaluation of bid (financial and technical), Due diligence report, Tender Committee Assessment report and Award of Contract.
d. Pre-qualification Criteria consists of the mandatory criteria as stipulated by PPA 2007 namely; Evidence of Company incorporation, Tax Clearance Certificate, registration with National Pension Commission, Industrial Training Fund and Bureau for Public Procurement, and Project - Specific criteria such as tender price, financial capability, technical capability, past performance, health and safety, managerial capacity, past experience and current work.
e. Criteria for Bid evaluation are a reflection of the objectives of the client. The respondents prefer multi criteria method of selection than the single Lowest Price Only) criteria.However, the single criteria is still widely accepted and “silently” adopted.

f. Use of fictitious document by contractors, lack of prequalification of consultants, unrealistic tender price and estimates, undue interference from higher authority, Political and social interference are identified as barriers hindering the optimum selection of contractors by professionals in the Nigerian construction industry.

g. Experience, Financial and Technical Capabilities, plants and equipment are the foremost factors that are widely considered in the selection of contractors in the Nigerian construction industry while completion date and health/ safety plans are less weighty in the selection process.

h. Procurement related factors;Project Stakeholders related factors, Daily Site factors, and Adequate planning factors are the most Critical Success Factors whichaccounts for the successful delivery of projects.

i. Division of responsibilities, organizational expertise and the co-ordination of site welfare contributes positively to planning and procurement

j. Strong monitoring and evaluation system, effective coordination, integration and project activities, effective project scheduling ensures effective project delivery.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study determined Contractor Selection Criteria for project delivery and concluded that in order to meet the emerging trend of development, it is necessary to develop pre-determined and objective selection criteria. Data analysis revealed that Selective and Open Competitive tendering process are widely used determinants. The impact of the Public Procurement Act (PPA 2007) which stipulates Mandatory and Project- Specific criteria for Prequalification and Tender Evaluation is highly responsible for the Selection Criteria adopted by various organisations and there is high level of compliance by the stakeholders in the construction industry. Consequently, Public Clients need topay greater attention to Multi-Criteria option for the selection of contractors as the traditional "Price Only" assessment criteria is inadequate for the satisfactory delivery of Public Building Projects. However, the niche in the inadequate use of the selection criteria can be enhanced by talking barriers identified as the use of fictitious documents by contractors, incorrect information, lack of pre-qualification of consultants, interference by higher authorities, political and social interferences Experience, Financial and Technical capabilities of the contractors are factors considered in the selection of contractors while Procurement related factors, Project Stakeholders related factors, Daily Site factors, and Adequate Planning factors are critical to successful delivery of projects; there exists significant relationships between the factors considered in the selection of contractors and the critical success factors for project delivery.

5.2 Recommendations

Based on the findings of investigations carried out on the strategies that could be deployed to improve the process of contractor selection, the following points were recommended:

i. Procurement officers should ensure that Due diligence Assessment is conducted and report submitted to the Tenders Committee to ensure proper authentication of tender documents submitted by the contractors.

ii. The use of e-Procurement should be encouraged to reduce the length of time and the cumbersome nature of open competitive tendering system

iii. For effective public project delivery with respect to cost, time and quality, it is very important at the onset to carefully consider all criteria and factors for the selection of contractor as each project has its own features attributes and peculiarities.

iv. The existing procurement law should be over- hauled to ensure fairness, integrity and objectivity of the selection process in order to eradicate undue external interference in the selection process.

v. There is need to pay more attention to the management capacity of contractors during the selection process for successful project delivery.

vi. It is necessary to make good assessment of the technical capacity and experience of the contractors when considering the cost factor for project delivery.

vii. It is worthy to note that the measure of resources and risks that contractors have cannot be assessed if there is a shallow knowledge of the managerial capacity during the selection process.

viii. There is need to pay more attention to contractors past relationships with clients when an effective external stakeholders management is of utmost priority for project delivery.

5.3 Contribution to Knowledge

The study has been able to establish that the selective and open competitive tendering are frequently used procedure in the selection of contractors; and it has also contributed the fact that the contractors selected for project delivery are those that are technically and financially capable to carry out the works. Research knowledge has also benefited from this study on the barriers hindering the optimum selection of contractors which must be tackled and they are: the use of fictitious documents by contractors, prequalification of consultants, incorrect information and political influence. The study has also contributed that procurement related factors are one of the foremost critical success factors and plays a serious role for project delivery in the Nigerian construction industry. It has also established that there is a relationship between the factors considered during the selection of contractors and the critical success factors for project delivery.

5.4 Area for Further Studies

Some research areas have arisen as a result of carrying out this study. Therefore, the following areas are recommended for further studies:

1. A framework development for the implementation of best practice criteria for the selection of contractors in the Nigerian construction industry.
2. The analysis of the impact of contractor selection processes on sustainable construction practices in Nigeria.
3. Development of E-procurement systems for adequate selection of contractors in the Nigerian construction industry.

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QUESTIONNAIRE

Dear Respondent,

I urge your time and efforts in contributing to an on-going Masters Thesis on "**Influence of Contractor Selection Criteria on Public Project Delivery in Abuja FCT**" in the Department of Building, Federal University of Technology, Minna. The research aims to assess the influence of contractors' selection criteria on project delivery in Abuja FCT, with the view to improving the performance of construction projects in the industry.

Data to be collected from this questionnaire survey will be used for academic purpose only and treated with utmost confidentiality. I would like to thank you very much for your invaluable help and contributions to the research. I look forward to hearing from you soon.

Yours Faithfully,

Asebiomo Modupe Mojisola
Postgraduate Student
Mtech/SET/2017/7354
Phone: 08036926356
Email: datemis@yahoo.com

APPENDIX A

SECTION A: RESPONDENT'S CHARACTERISTICS

Instruction: Please tick (√) the correct option as appropriate.

1. **Sex**: Male [ ] Female [ ]
2. **Nationality**: Nigerian [ ] Non-Nigerian [ ]

3. **Age**……
4. **Years of Experience**:

1 – 5 years	[ ]	16 – 20 years	[ ]
6 – 10 years	[ ]	21 – 25 years	[ ]
11 – 15 years	[ ]	above 25 years	[ ]

5. **Educational Status**:

OND	[ ]	MSc	[ ]
HND	[ ]	PhD	[ ]
BSc	[ ]	Others (Specify)…….	

6. **Professional Affiliation**:

NIOB[ ] NIA[ ] NIQS[ ] Others (specify)……

Section B: The Selection Criteria Process of Contractors

7. Based on your experience please, how often are the following tendering types being used in selection of contractors to carry out public building projects in your organisation.

S/No	Tendering type	Very Often	Often	Rare	Very Rare	Not at all
i	Competitive Tendering (Contract are advertised in national and technical dailies and open to general public)					
ii	Selective Tendering (Invitation from client to selected contractors to tender according to the code of selective tendering)					
iii	Negotiated Tendering (Client negotiates price with contractor for general or specialist work)					
iv	Serial Tendering (Contract for series of familiar project)					
v	Two stage Tendering (when relevant information to tender is not available					

	to arrive at a realistic contract price.					
vi	Single stage Tendering (contractor is usually given dummy bill of quantity to insert fair rates of basic materials labour and this forms the basis for signing the contract					
vii	Turnkey project (contractor is responsible for the design, construction, equipping and handing over to the client)					

Section C: The Barriers Hindering the Optimum Selection of Contractors

8. Based on your experience, to what extent do you agree that the following are the barriers that hinder the optimum selection of contractors in building projects.

S/No	Barriers	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure
1	**Tender price and estimates**					
	Labour rates					
	Material cost					
	Preliminaries					
	Builders work					
	Wrong method of estimation					
2	**Compliance with statutory procurement laws**					
	Evidence of Company Registration					
	Evidence of Tax payment					
	Registration with Pension Commission					
	Sworn affidavit from Court					
	Registration with Industrial Trust Fund					
3	**Economic situation**					
	Overall national economic performance					
	Availabilty of projects					
	Project financing					

	Anticipated rate of return on project					
	Risk involved in the project					
4	**Influence of external forces or cartels**					
	Collusion by contractors to weaken selection process					
	Formation of interest group					
	Interference of higher interest authority on preffered candidate					
	Political interest					
5	**Availability of resources**					
	Incorrect planning					
	Inadequate labour availability					
	Insufficient budget allocation					
	Plant and equipment allocation					
6	**Project characteristics**					
	Size of project					
	Completion period					
	Location of project					
	Project cash flow					
	Complexity of project					
7	**Project documentation**					
	Type of project					
	Type of procurement method					
	Client consultation and involvement					
	Completeness of documents					
	Level of Technology					
8	**Prequalification of consultants**					
	Inadequate time to prequalify consultant					
	Qualification of consultants					

	Capability of consultants					
9	**Wrong presentation of pre-qualification documents by the contractors.**					
	Lack of good understanding of how to present the basic data demanded					
	Arithmetic errors in computation of prices					
	None possession of letters of awards from previous jobs					
	Absence of certificates of practical completion on similar jobs executed					
10	**Company related issues**					
	General overheads					
	Requirement of bond capacity					
	Tax liability					
	Mode of financing bond					
	Mode of financing payment					
11	**Insufficient time for selection process**					
	Delay in contractual procedures					
	Governments policies					
	Assessors excuses and unwillingness					
	Public contracts are procured only within a budget year					
12	**Contractors length of time in business**					
	Company stability					
	Scope of project					
	Capacity of work					
	Depth of organization					
	Value of project executed in the last five year					
13	**Use of fictitious document by**					

	contractors					
	Presentation of false bank account					
	False profile of technical staff					
	Fictitious increase in staff strength					
	Fictitious claim to plant and equipment					
	Improper presentation of past projects					
14	**Bidding situation**					
	Number of competitors					
	Identity of competitors					
	Bidding document requirement					
	Prequalification document					
	Incomplete information from client and stakeholders.					
15	**Political influence**					
	Bureaucracy in tendering procedure					
	Fraudulent practices					
	Fraudulent kickbacks and inducements					
	Social and cultural practices					
	Poor collaboration within stakeholders					

Section D: The Factors Considered In the Selection of Contractors.

8. Based on your experience, to what extent have the following factors been considered in the selection of contractors for exellent delivery of building projects?

S/No	Contractor Selection Factors	Very High	High	Low	Very Low	Not sure
1	**Technical Capability**					
	Previous experience on similar type of projects completed					
	Previous experience on similar size of projects					

	completed					
	Qualification of technical staff					
	Experience of Technical staff					
	Method statement					
	Work programme					
2	**Financial Capability**					
	Financial stability					
	Credit rating					
	Banking arrangement					
	Liquidity ratio					
	Working capital					
	Turnover					
3	**Health and Safety Capability**					
	Health, safety and environmental plan					
	Management safety policy					
	Experience in handling dangerous substance					
	Safety record					
	Company insurance policy					
4	**Reputation**					
	Past Project failure					
	Organization maturity					
	Litigation					
	Records of claims and contractual disputes					
	Number of previous completed project					
5	**Management Capability**					
	Past management performance					
	Qualification of project manager					
	Experience of level project manager					
	Experience of management staff					

	Current workload and capability					
6	**Organization Culture**					
	Familiarity with local working culture					
	Contractor familiarity with local suppliers					
	Familiarity with regulatory authority					
	Experience within the location					
	Contractor's familiarity with weather conditions					
7	**Experience**					
	Experience over the last five years					
	Completed projects					
	Current Projects					
	Market familiarity					
	Labour familiarlity					
8	**Project Management organization**					
	Planning and programming					
	Site organization					
	Experience and completion of project on schedule					
	Adequate material control					
	Past project management performance					
9	**Management knowledge**					
	Scheduling cost control system					
	Material and Purchasing Control					
	Procurement method					
	Risk avoidance					
	Risk Responsibilities					
10	**Plant and Equipment**					
	Availability of contractor owned equipment					
	Adequacy plant and equipment					
	Availability of suitable tools and equipment					

	Plant and equipment holding					
	Ability to operate and maintain equipment					
11	**Past failures**					
	Previous failure to successfully complete project					
	Past and present experience reporting legal status					
	Contracts not renewed due to failure					
	Contracts terminated					
	Financial penalties previously levied on failed contracts					
12	**Past performance and quality**					
	Quality of workmanship					
	Quality control programme					
	Quality level (aesthetics, confidence in design)					
	Past performance rating					
	Completion and quality Assurance Certificate					
13	**Personnel capability**					
	Availability of first line supervisor					
	Availability of skilled craftsmen					
	Credibility of key staff					
	Training and skilled level of craftsman					
	Technical expertise of craftsman					
14	**Quality control and assurance**					
	Operational procedure					
	Work quality record					
	Compliance with specification					
	Procedures for inspection of work in progress					
	Productivity improvement program					
15	**Past relationship with client and others**					
	Relationship with client					
	Relationship with sub-contractors					

	Relationship with employees					
	Relationship with consultants					
	Degree of contractor cooperation with stakeholders					

Section E: The Critical Success Factors (CSFs) For Project Delivery

9. To what extent do you agree that the following are the critical success factors (CSFs) for project delivery?

S/No	CSFs	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Sure
1	**Project management factors**					
	Strong monitoring and evaluation system					
	Effectiveness of coordination & integration of project activities					
	Effective communication management					
	Effective project scheduling & budgeting					
	Commitment to project					
2	**Adequate planning factors**					
	Clearly documented project milestones & deliverables					
	Valid realistic timescale					
	Production of accurate cost estimates					
	Detailed resource requirements					
	Prompt allocation of resources					
3	**Procurement related factors**					
	Methods of material procurement					
	Tendering method					
	Contracting method					
	Effective contract administration					
	Clear and detailed procurement process					
4	**External factors**					
	Economic environment					
	Social environment					
	Political environment					
	Administrative approvals					
	Familiarity with weather conditions					
5	**Project stakeholders related factors**					
	Removing obstacles					
	Dealing with community issues					
	Adequate capture of stakeholders requirements					
	Engagement of external stakeholders					
	Frequent progress meetings					

6	**Daily site factors**					
	Contractors' ability to interprete designs					
	Adequate finance for daily activities					
	Leadership skills of the project manager					
	Site welfare					
	Project plans and schedules					
7	**Contractor resource availability factors**					
	Prompt allocation of sufficient resources					
	Construction method					
	Plant resources availability					
	Response to instruction					
	Plant and equipment holding					
8	**Project risk related factors**					
	Effective security					
	Limited or no restiveness					
	Compliance to environment standards					
	Risk control					
	Risk response plan					
9	**Performance related factors**					
	Quality Assurance					
	Quality management					
	Flexibility of management					
	Evidence of timely delivery of projects					
	Quality control					
10	**Incentive related factors**					
	Promoting good handlers					
	Regular payment of workers salary					
	Ability to work as a team					
	Giving bonuses to workers					
	Reward for integrity and commitment					
11	**Managerial related factors**					
	Division of responsibility					
	Organization expertise					
	Technical alternatives					
	Attention to site safety					
	Co-ordination of site welfare					
12	**Technical related factors**					
	Appropriate Method statement					
	Effective operational procedure					
	Availability of suitable equipment					
	Availability of key personnel					
	Level of technology					
13	**Quality and standard factors**					
	Standard workmanship					

	Technical competence					
	Ability to formulate program					
	Ability to remedy defect timely					
	Quality of materials procured					
14	**Local factors**					
	Location of company					
	Understanding the local language					
	Familiarity with location of project					
	Familiarity with local labour					
	Familiarity with weather conditions					
15	**Realistic estimates of schedule and cost in terms of**					
	Labour rates					
	Material rates					
	Builders work					
	Contractor Overheads					
	Unit price					

APPENDIX B

INTERVIEW QUESTIONS FOR PUBLIC CLIENTS (Guide)

Participants' Characteristics

1. Ministry/organization: .....
2. Profession: .....
3. Years of experience: .....
4. Level of education: .....

Structured Questions

1. What type of tendering system do you often use? Why?
2. Describe in detail the process of selecting contractors in your organization? – Are there documents to support the above process? If no why? (reasons)
3. What are the objectives of the client in the prequalification process?
4. What are the criteria used for prequalification?
5. What are the criteria used for bid evaluation in your organization?
6. What are the hindrances encountered in the selection of contractors.
7. Are the selection team usually influenced by external forces? What other difficulties are faced during the selection process.
8. Is there usually a common basis the assessors use with which a contractor is finally selected? Please expatiate on this.
9. What are the major attributes among the criteria are the assessors expected to see in contractors before a contractor can be selected?
10. Is project delivery given priority consideration in the selection of contractor at all times? If yes, why? If no, why?
11. What are the main factors considered in the selection that has to do with project delivery?