

Appraisal of Criteria for Prequalification of Subcontractor in Construction Projects in Nigeria

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Abstract: *The dependence of general contractor on subcontractors to execute specialized portion of construction work makes the success of construction projects highly susceptible to the performance of sub-contracting organizations'. The purpose of this paper is to appraise the criteria for prequalifying subcontractors in construction project and evaluate the level of application of these criteria by the consultants' during the subcontractors' evaluation with a view to determining the effects of subcontractors' selection and quality. Data were obtained with the aid of well-structured questionnaire and were administered to clients, contractors and consultants' in Ondo and Ekiti state. A total of 100 questionnaires were administered in Ondo and Ekiti State out of which 74 were recovered and 73 were suitable for analysis. The data were analyzed using statistical method namely descriptive statistic. Mean item score and severity index was used for analysis. Historical data was analyzed using correlation and regression. The result indicates that technical capability and ability to deliver project within schedule time are mostly important amongst other criteria for pre-qualifying subcontractors. Result also indicate that ability to deliver projects within scheduled time and ability to deliver projects within scheduled budget are mostly important amongst others for the application of pre-qualifying criteria. The result also indicates there is a great correlation in completion time and cost of project in the delivery of sub-contractors jobs at the level of significance of < 0.00. Conclusively prequalification of sub-contractor should not be neglected or be seen as a waste of time as this will help the construction projects a great deal in good and prompt subcontract jobs.*

Keywords: Construction, Criteria, Subcontractor, Prequalification

1. Introduction

Construction project is a project that is awarded to a general contractor, which in turn resort it out to specialize outside firm to carry out some specific project activities. (Lew Yoke-Lian, S. Hassim, R.Muniandy and Law Teik-Hua, 2012). General contractors are responsible for managing the project such as contract administration with clients, project financing, material and equipment procuring, and monitoring the project progress (Benjaoran, 2009). The general contractors' performance depends immensely on Sub-contractors (Albino and Gravelli, 1998). This statement is reinforced by (Mbachu, 2008) which stated that the ability of general contractor and consultant to deliver the project within time, quality and costs depend largely on performance of Sub-contractors.

Sub-contracting is a common practice in the construction industry. On any particular project, general contractors may rely on 20 to 40 sub-contractors to perform the specific work items that are required (McCord 2010). A typical group of contractors that work together on a project may include such diverse trades as electrical, roofing and steel erection to name a few. The characteristics of the project will determine the type, size and capabilities of each sub-contractor that may be required (Knutson, 2003). Each project has a unique combination of job-specific sub-contractors that are typically assembled under a general contractor acting as the head who oversee the project.

The general contractor may also have his own labour force working alongside the various sub-contractors throughout the project. There is a team approach to completing the work on most projects with the general contractor taking the lead to manage the jobsite and direct the personnel in achieving the

various tasks on the site.

Sub-contractors help the general contractors to overcome problems related to the need for special expertise, shortage in resources and limitation in finances (Elazouni and Metwally, 2000). Sub-contractors are vital to success of every construction project.

The reliance of general contractors on sub-contractors to execute major portions of construction work makes the success of construction projects highly susceptible to the performance of sub-contracting organizations. As a result, researchers emphasize the importance of selecting appropriate sub-contractors. Hence, the success level of projects may depend on the philosophy of prequalifying sub-contractors (Mohammad, 2009).

Prequalification is a pre-tender process that aims at assessing the capability and competence of potential bidders through screening of Sub-contractors according to a given set of criteria (Russell and Skibniewski, 1988; Hatush and Skitmore, 1997). Ultimately, this process acts as a tool for the owner to select a group of contractors with the capability and means of successfully finishing the project, ensuring that the bid winner has the ability to deliver the contract (Hatush and Skitmore, 1997).

Sub-contractors selected to tender bids should be competent for the execution of the project, because the selection of an incompetent sub-contractor may lead to delays, disputes, shoddy job and even termination. When nominated sub-contracts are necessary, the contractors should ensure that the named Sub-contractors are capable of completing the job satisfactorily; otherwise, they could jeopardize the productivity and quality of the entire project.

Sub-contractors' prequalification could eliminate some inherently incapable sub-contractors from being invited to participate in the project bid. Although sub-contractor prequalification is intended to reduce bidding costs, it has the potential to become costly to the point of being counter-productive as more and more decision criteria are introduced into the process.

This study aimed to carry out research in this area because subcontracting is used much more extensively on housing and building construction projects than in engineering and industrial projects (Clough and Sears 1994). Therefore attention shall be given to the issue of pre-qualifying Sub-contractors, which are the main participant in almost the construction project (same 2009).

(Thobur and Takashima, 1992) provide evidence of a growth in the use of sub-contract arrangements by UK firms in their attempt to develop greater flexibility to both competition and other market conditions. Construction industry is has a large number of small companies that provide sub-contracting services to their larger counterparts. (Hillbrandt and Cannon, 1990). Mohammad, (2009) researched the selection of sub-contractors and combines sub-contractor bid price along with the subjective criteria, Versile and Ahmet (2012) researched sub-contractors selection using analytical process.

Mohamed, Ahmed, and Mostafa, (2013) discussed on the factors influencing sub-contractors selection in construction project but little attention has been paid to assessing these criteria for prequalifying sub-contractors in construction projects in Ondo and Ekiti State, Nigeria as this study will be touching this particular area.

Prequalification can reduce the complexity of the contracts, as the early screening of the Sub-contractors allows selection of a Sub-contractor who is able to execute the assigned project in accordance with all project requirements. On the other hand, poor selection of the Sub-contractor can result in magnification of the problems encountered during the project; no matter how meticulously the contract has been drawn (Russell, Hancher, and Skibniewski, 1992). This process also has the potential to reduce the number of bidders, without undermining the legality and fairness of the bidding process, through consideration of transparent and predefined criteria that evaluate the candidate's capabilities. Although many owners rely on surety bonds as a proxy for prequalification, bonding capacity has only moderate importance - bonding capacity alone is not a good indicator of financial stability (Russell and Skibniewski, 1988). One other significant finding was that geographic location and experience in that geographic location are considered the least important categories (Russell, Hancher, and Skibniewski, 1992; Hatush and Skitmore, 1997; Jennings and Holt, 1998). However, this is contrary to expectations as public owners are pressured to hire local contractors (Russell and Skibniewski, 1988).

2. Brief Review

2.1 Subcontractor

The construction industry is not only unique in many ways but also has enormous scope with several varied fields in which we have the building participants such as: Architects, Quantity surveyors, Project Managers, Engineers and contractors that contribute to the overall objectives of the project. Every prospective building owner aspires to attain a completed facility of the best possible quality within the specified time while keeping the final cost within the budget estimate but unfortunately, this is not always achieved sometimes because of the procedures involved in executing the construction contracts.

This process begins with the choice of a contractor to be entrusted with construction works, with the capability to meet the specific requirements of the owner under the contract. The general contractors are responsible for managing the project such as contract administration with clients, project financing, material and equipment procuring, and monitoring the project progress (Benjamin, 2000). The ability of general contractors and consultant to deliver the project within the time, quality and costs depend largely on performance of Sub-contractors (Mbachu, 2008). Sub-contractors are specialist in the execution of a specific job; they act as agents of the production system of the contractor company in supplying materials, manpower, equipment, tools or designs (Kumaraswamy and Matthews, 2000). A sub-contractor is a construction firm that contracts with a general contractor to perform some aspect of the general contractor's work. In most construction projects, a vital role is played by Sub-contractors who are hired to perform specific tasks on a project. In the usual case, the general contractor will perform the basic operations and subcontract the remainder to various specialty contractors. Subcontracting is used much more extensively on housing and building construction projects than on engineering and industrial projects (Cloughs and Sears, 1994).

Traditionally, the term 'sub-contracting' is used in construction projects when a main contractor exists. Another notable difference is that Sub-contractors' products are a part of the end product, whereas suppliers' products are basic inputs for construction. A sub-contractor is a business entity which has a contract agreement with a main contractor to provide a portion of the work, material input, or services on a project which the contractor has agreed to perform. A construction project is awarded to a general contractor or prime contractor or principal contractor or main contractor, which resorts their work out to specialize outside firm to carry out specific project activities (Lew, 2012).

Sub-contractors are specialist in the execution of a specific job; they act as an agent of the production system of the contractor company in supplying materials, manpower, equipment, tools or designs (Kumaraswamy, 2000). In most construction projects, a vital role is played by Sub-contractors who are hired to perform specific tasks on a project. In the usual case, the general contractor will perform the basic operations and subcontract the remainder to various specialty contractors. Subcontracting has been presented as

an organizational alternative for some economic activities (Chung and Ng, 2006). Firms are decentralizing their jobs more and more allowing subcontracting to become a basic part of the work of the organization (Toriola, 2011).

2.2 Prequalification

Waara and Brochner (2006) identified prequalification as the only possible way of protecting the capable and established firms with the client getting a more economical job. It ensures that invitation to bid is only given to the firms who have adequate capabilities and resources to execute the project (Gale, 2006). The effective implementation of competitive bidding is dependent on Sub-contractor's prequalification as this, if adequately implemented, serves to prevent fronting and window dressing by incompetent and corrupt contractors. The different government circulars on the implementation of the Due Process Certification as summarized by Esenwa (2004) pointed out that the call for pre-qualification is one of the major criteria for the certification of any public projects awarded. Going by the Inter-America Development Banks report (1997); prequalification depends on the "ability of the potential Sub-contractors to carry out the works in satisfactory manner". The criteria for pre-qualification stated in the report include Financial capability, Details of plants and equipment, Safety consciousness on jobsite, Evidence of similar job executed, previous relationship with the organization, Past performance in relevant previous project, Technical capability, Relationship with the main contractor, Relationship with the client, Health and Safety consciousness, Reputation, Ability to deliver projects within scheduled time, Length of time in business, Ability to deliver projects within budget and Managerial capability. Other contracts presently being undertaken, any litigation or Arbitration from previous contracts in the last five years. The 2007 Procurement Act also stipulates professional and technical qualifications, financial capability, equipment and adequate personnel to execute the contract (Ibrahim, 2008). Prequalification systems can affect competition in the marketplace. Li, Foulger, and Phillips (2008) suggest that prequalification can limit the number of available tenderers creating reduced competitive behaviour from those invited to tender. Ngai, Drew, Lo and Skitmore (2002) say the two prime factors affecting the degree of competition are the number of contractors able to tender a project and market conditions at the time. Hence, prequalification systems need to appeal to capable contractors particularly in boom times. Jennings and Holt's (1998) research uncovered that larger contractors felt that prequalification systems with stringent multi-criteria selection decision making improves their chances of winning contracts.

Wong (2004) points to the degree of sophistication of some assessment methods make them difficult for client use. Furthermore, Minchin and Smith (2001) contend that a problem with prequalification is that it adds to client and contractor workloads. In current times where more outputs are increasingly sought from fewer resources this becomes an issue. Mangitung and Emsley (2002) add that there is a need to reduce repetition, duplication and subsequent wasted resources brought about by industry prequalification. They

suggest centralisation of prequalification systems through a third party as a possible solution for Sub-contractors assessment. Palaneeswaran and Kumaraswamy (2005) found that designer/builder prequalification systems face difficulties in various areas including those of transparency and non-standard practices. Ultimately, it would seem that prequalification systems need to fulfil their objectives whilst being non burdensome and fair on the people involved.

The rationale behind Sub-contractor prequalification appears valid however the above suggests that many experts believe that prequalification systems still harbour significant problems.

This section will present an overview of existing prequalification models, including their advantages and disadvantages. It is important to note that prequalification is different than other multi-criteria problems and the decision making method used should be able to deal with uncertain, incomplete or imprecise assessments that might be present. Prequalification decision making is a nonlinear two group classification problem because the relation between the contractors attributes and the corresponding decisions have a nonlinear relationship (Lam, E.W. M 2000).

In this system the decision of prequalification is made through using decision rules and not calculated scores (Tran, 2002). This model's disadvantage is its implied treatment of unknowns imbedded in heuristic knowledge (Russell, Skibniewski, and Cozier, 1990).

2.3 Criteria for Prequalification of Contractor

2.3.1 Financial Stability

Financial stability is a factor that makes its appearance in almost every prequalifying team's list. Basically this criterion involves evaluating the financial condition of each candidate sub-contractor. This indicates the capacity of the candidate of the contractor to fully meet financial commitments. Russell (1990) indicated the importance of contractor's credit rating, banking arrangements and financial statement to measure the solvency (or liquidity), efficiency and profitability of a sub-contractor, in assessing his financial capability.

2.3.2 Experience

This criteria has been used in regular use for prequalification but has been called by different names like past project performed, past performance, experience etc. This involves evaluating the candidate of the contractor's project records to determine whether or not he has handled jobs of similar scope and complexity in the past or currently. Birrell (1985) indicated that possessing experience in projects similar to the proposed in terms of type, size and complexity should be an important evaluation criterion. This can be determined from satisfaction expressed by past clients/customers. This can also include investigating the performance history of the sub-contractor in terms of completion on schedule and within budget, effectiveness of quality and cost control, and the quality of finished products.

2.3.3 Managerial capability

Studies by Adrian (1987) and Hsieh (1998) indicate that sub-

contractors bear responsibility to manage their own affairs on the jobsite without much support from the general contractor. This is the ability of the sub-contractor to be able to efficiently manage his workmen and the aspect of his work as this will tell much on the project whether it will slow the work down or speed up the rate of work. It is also known as experience of key personnel, it is concerned with the qualification and skill of the management (administrative staff and engineering professionals) and labor crew (craftsmen and trades). This is important as Clough and Sears (1994) remarked that the financial success of a construction enterprise depends almost entirely on the quality of its management. Russell (1991) contended that 8 out of 14 projects studied failed because of lack experience of the management and technical staff.

2.3.4 Reputation

The question of a Sub-contractor having a good reputation cannot be overlooked. No matter how good or how experienced a Sub-contractor is, without a good reputation from in his surrounding area any project committed to him will be a flop.

2.3.5 Details of Plant and Equipment

Availability of equipment and their maintenance program are major factors affecting Sub-contractor performance. In this criterion the available resources in terms of personnel, plant and equipment are evaluated (Al-Gobali 1994). Equipment shortage and low productivity may cause project delay (Hazmi, 1987) and equipment cost control (maintenance, repair and replacement) is an important element of sub-contractor's failure.

2.3.6 Procurement and Material Management

With material cost ranging between 30 to 60% of total building project cost, procurement and material management are evidently essential to project success. Ubaid (1991) found that material delay is a major cause of project delay. Contractor's Procurement expertise and material management skills will result in on-time delivery avoiding delay as well as the additional cost for storage and double handling of early material delivery. Al-Gobali (1994) also lists procurement as one of the organizational factors that make or break the chances of the success of the project.

2.3.7 Safety Record

Accidents at construction sites may not only result in a loss of life but also result in increased insurance premium rates on the subsequent projects by sub-contractor. It also results in a loss of goodwill. The selection of a sub-contractor with a good safety record can minimize construction accidents and thereby save construction costs (Al-Gobali 1994). Ubaid (1991) ranked this criterion as number 8 out of 14 factors affecting project performance. A sub-contractor must be safety conscious on job site ensuring that every safety rules on site is strictly adhered to.

2.3.8 Quality of previous job executed

A quality program in place always increases the chances of a better finished project. The quality of previous job executed by the sub-contractor increases his chances of getting more project directing even without going through the long process

of pre-qualification

2.3.9 Relationship with the Main Contractor

Some sub-contractor has the contractor they are working with each time an opportunity for job surface. And this is due to the quality of job rendered by the sub-contractor and the relationship they have built while working together. It is through this same means that some sub-contractors are brought into a project. i.e. Previous relationship. Earlier interaction between the contractor and the sub-contractor plays a vital role in selecting a sub-contractor as the contractor prefers to work again with a sub-contractor that has produced the earlier project at the required cost, time and quality benchmarks.

2.3.10 Safety and Health Requirements

Virtually all general contractors have a requirement for their sub-contractors work in a safe manner and in a good health condition to conduct their on-site operations in compliance with relevant safety codes and laws. Because the general contractor typically bears the burden of whatsoever happens on jobsite. He must ensure the safety and good health condition on the jobsite (Mc Cord, 2010) virtually all general contractors require that their sub-contractors actively participate in the safety and health management on the jobsite (Clough, Sears and Sears 2005). Some sub-contractors may not have a sophisticated safety and health program and find some of these requirements to be a hardship (Garrett, 1979). These requirements may be considered to be too burdensome by some sub-contractors and therefore may negatively affect their decision to bid to those general contractors with such safety and health programs.

2.3.11 Evidence of similar job executed

This is an important criterion that increases the chances of the sub-contractor winning a job as this will show good capability and competence. It also show how experienced the sub-contractor his. This criterion cannot be overlooked as this will help in good timing and project delivery.

3. Methodology

The target population of the study comprised of professionals in the construction industry who have practical experience both in public and private sectors of the industry; contractors, clients, and the consultants such as: Quantity Surveyors, Architect and Structural Engineers within Ondo and Ekiti States. The study was done through questionnaires distribution to seek the view of professionals in the public and private sectors which were self-administered. Random sampling was used, due to the nature of the research work; also considering the largeness of the building sector of the construction industry and the large number of construction projects carried out. The questionnaires were structured to focus on general particulars of the professionals in terms of qualification (both educational and professional), type of organization whether consulting or contracting, official designation. Structured questions prepared to identify and assess the criteria for prequalifying sub-contractors in construction project, assess the level of application of pre-qualification criteria by the consultants in their

recommendation and also assess the effects of the criteria in delivery of subcontract job in terms of cost and time. The information and data collected for this research were adequately analysed using statistical tools. Two statistical methods will be applied, namely descriptive statistic and inferential statistics. Tables were used to analyse the first section of the questionnaire while mean item score and severity index was used to analyse other sections. The historical data was analysed using correlation and regression.

4. Discussion of Findings

4.1 Data Presentation

About 62.2% of the respondents are from Ekiti State and 37.8% of the respondents are from Ondo State, 68.5% of the respondents are from Public Client, 12.3% are from consulting Client, 9.6% are from Private Client, 8.2% are from Contracting Client and 1.4% are the others that are not from any of these sector which reveals that the idea gotten for this research is distributed among different sector of the construction industry which reduces the idea of biasness to the barest minimum, 50% of the respondents are Engineers, 27.1% of the respondents are Quantity surveyor and 18.1% of the respondents are Architects, 2.9% of the respondents are Contractors and 1.4% of the respondents are Sub-contractor, 35.1% have between 6-10 years of experience, 25.7% have between 0 - 5 years of experience, 18.9% have between 11-15 years of experience, 10.8% of the respondents have 20 years and above and 9.5% have between 16 – 20 years of working experience. Therefore, it is evident that the data retrieved from these questionnaires are reliable and good enough to form a basis for this project. The statistics shows that the respondents have enough experience to give adequate data and correct information on this study.

CPS means Criteria for Prequalification of Subcontractor.

Table 1: Criteria for Prequalification of Subcontractor

CPS	Mean	Rank
Technical capability	4.64	1
Ability to deliver projects within scheduled time	4.62	2
Quality of previous job executed	4.58	3
Financial capability	4.50	4
Details of plants and equipments	4.49	5
Ability to deliver projects within budget	4.41	6
Evidence of similar job executed	4.39	7
Past Performance in relevant previous projects	4.34	8
Reputation	4.32	9
Managerial Capability	4.27	10
Safety consciousness on jobsite	4.11	11
Health and safety consciousness	4.08	12
Length of time in business	3.92	13
Relationship with the main contractor	3.65	14
Previous relationship with the organization	3.57	15
Relationship with the Client	3.42	16

Table 1 shows the ranking of the Criteria for Pre-qualifying Sub-contractors factors which reveals that Technical capability ranks the most among the criteria with the mean item score of 4.64, Ability to deliver projects within scheduled time ranked second with the mean item score of 4.62, Quality of previous job executed ranks third with the

mean item score of 4.58 and Relationship with the Client ranks the least among the factors with the mean item score of 3.42.

Table 2: Application of Prequalification Criteria

Application of Pre-Qualifying Criteria	Mean	Rank
Ability to deliver projects within scheduled time	4.59	1
Ability to deliver projects within budget	4.54	2
Financial capability	4.47	3
Technical capability	4.47	4
Quality of previous job executed	4.46	5
Evidence of similar job executed	4.38	6
Details of plants and equipment	4.34	7
Managerial Capability	4.32	8
Reputation	4.31	9
Past Performance in relevant previous projects	4.30	10
Safety consciousness on jobsite	4.09	11
Length of time in business	4.03	12
Health and safety consciousness	3.92	13
Previous relationship with the organization	3.91	14
Relationship with the main contractor	3.72	15
Relationship with the Client	3.54	16

Table 2 shows the ranking of the application of Criteria for Pre-qualifying Sub-contractors which reveals that Ability to deliver projects within scheduled time ranks the most among the criteria with the mean item score of 4.59 Ability to deliver projects within budget ranked second 4.54, Technical capability ranked third 4.47 and Relationship with the Client ranks the least among the criteria with the mean item score of 3.54.

Table 3 shows the severity index (SI) calculated for each effect of Pre-qualification criteria on cost of project. These criteria were ranked in accordance to their severity index. According to the severity rating, the criterion that appears as the lead is the financial capability with the index of 0.911. Technical capability is the second prominent criteria with the severity index of 0.900. Ability to deliver projects within scheduled time was next to it with the severity index of 0.876. Previous relationship with the organization is the least prominent criteria on delivery of subcontracts works in terms of cost of construction project with the severity index of 0.697. Relationship with the Client was next with the severity index of 0.714.

Table 3: Effect of Pre-qualifying criteria on Cost

Effect of Pre-Qualifying Criteria on Cost of Sub-Contract Works	Mean	Severity Index	Rank
Financial capability	4.55	.911	1
Technical capability	4.50	.900	2
Ability to deliver projects within scheduled time	4.38	.876	3
Quality of work previously executed	4.35	.870	4
Ability to deliver projects within budget	4.34	.868	5
Managerial Capability	4.31	.862	6
Details of plants and equipments	4.30	.859	7
Past Performance in relevant previous projects	4.18	.835	8
Reputation	4.16	.832	9
Evidence of similar project executed	4.09	.819	10
Length of time in business	3.92	.784	11
Safety consciousness on jobsite	3.89	.778	12
Health and safety consciousness	3.84	.768	13

Relationship with the main contractor	3.72	.743	14
Relationship with the Client	3.57	.714	15
Previous relationship with the organization	3.49	.697	16

Table 4 shows the severity index (SI) calculated for each effect of Pre-qualification criteria on cost of construction project. These criteria were ranked in accordance to their severity index. According to the severity index, financial capability ranked highest with the severity index of 0.927. Technical capability is the second prominent criteria with the severity index of 0.892. Managerial Capability ranked third with the severity index of 0.876. Previous relationship with the organization is the least prominent criteria on delivery of subcontracts works in terms of cost of construction project with the severity index of 0.676. Relationship with the Client was next with the severity index of 0.738

Table 4: Effect of Prequalification Criteria on Completion Time

Effect of Pre-Qualifying Criteria On Completion Time	Mean	Severity Index	Rank
Financial capability	4.64	.927	1
Technical capability	4.46	.892	2
Managerial Capability	4.38	.876	3
Ability to deliver projects within scheduled time	4.36	.873	4
Ability to deliver projects within budget	4.34	.868	5
Details of plants and equipments	4.28	.857	6
Reputation	4.15	.830	7
Quality of work previously executed	4.14	.827	8
Past Performance in relevant previous projects	4.08	.816	9
Evidence of similar project executed	4.04	.808	10
Length of time in business	3.99	.797	11
Health and safety consciousness	3.89	.778	12
Relationship with the main contractor	3.85	.770	13
Safety consciousness on jobsite	3.82	.765	14
Relationship with the Client	3.69	.738	15
Previous relationship with the organization	3.38	.676	16

4.2 Discussion

4.2.1 Criteria for prequalifying sub-contractors in construction project

Several criteria for Pre-qualifying Sub-contractors has been identified by many researchers but according to the findings of this study, Technical Capability was the most prominent Criteria with the mean item score of 4.64, Ability to deliver projects within scheduled time was ranked second with mean item score of 4.62, Quality of previous job executed was ranked third with the mean item score of 4.58 while Relationship with client ranked the least with the mean item score of 3.42.

4.2.1 Technical Capability

From this research it is observed that technical capability of the sub-contractor is highly important as this is the ability of the sub-contractor to be well trained and vast in the area of his specialisation and a good sense of project delivery. A Sub-contractor must be able to deliver a good job in the area in which he chooses to specialise. This being part of pre-qualification criteria out of which he will be tested cannot be ignored

4.2.3 Ability to deliver project within scheduled time

From the research carried out ability to deliver project within scheduled time was ranked second in the criteria for pre-qualification of sub-contractors. This also suggests that this criterion in the pre-qualification procedure cannot be joked with. A check on the list of evidence of past project will reveal how time conscious the sub-contractor is by correlating the proposed completion period of the job executed by him and the actual completion period. Sub-contractor that is not time conscious will jeopardise the objective of a project as this will also affect every other things on the project such as: increase in cost and lackadaisical attitude in place of work to mention a few.

4.2.4 Level of application of pre-qualification criteria in Consultants' recommendation

According to the research carried out on this study. It was discovered that these Pre-qualification criteria are been applied. Ability to deliver projects within Scheduled time ranked highest with the mean item score of 4.59, Ability to deliver projects within budget ranked second with the mean item score of 4.52, Quality of previous job executed ranked third with the mean item score of 4.47 while Relationship with the client ranked the list with the mean item score of 3.54

4.2.5 Ability to deliver project within scheduled time

Accurate prediction of construction time at planning and bid preparation stages is necessary for including realistic project duration information in the bid package (Choudhury,2008). From the research carried out ability to deliver project within scheduled time was ranked second in the level of application of pre-qualification criteria in consultants' recommendation. This also suggests that this criterion is mostly applied in the pre-qualification procedure and cannot be ignored. A check on the list of evidence of past project will reveal how time conscious the sub-contractor is by correlating the proposed completion period of the job executed by him and the actual completion period. Sub-contractor that is not time conscious will jeopardise the objective of a project as this will also affect every other things on the project such as: increase in cost and lackadaisical attitude in place of work to mention a few. This result is saying that any sub-contractor that does not possess this criterion cannot be considered.

4.2.6 Ability to deliver project within budget

From the research carried out Ability to deliver project within budget was ranked second in the level of application of pre-qualification criteria. Any sub-contract work aside the change orders introduced during the course of construction that shoots beyond the estimated cost is assumed to be a job that is not properly estimated for which means there is a problem with the estimation of the budget. This means that both criteria complement one another such that if a project does not finish at an expected period of time, definitely the cost of project will be increased.

4.2.7 Effects of criteria in the delivery of sub-contract job in terms of cost and time

From Table 5, the correlation coefficient is 0.725 and $p = 0.001$ which shows great significance at $p < 0.01$ signifying that there is great correlation between initial cost of Sub-

contract work and Final cost of Subcontract work.

$$\text{Model} = -6.078 + 0.896$$

In Table 5, the adjusted R² for final cost is 0.803. This shows that 80.3% of variation in Contract sum of the Sub-contract work is ascribed to the predictor variable. This model also gives an indicator that 89.6% of the Contract sum of Sub-contract work is explained by cost escalation while 10.4% of the variation in Contract sum of Sub-contract work is explained by other variables. The F statistic (F = 163.056, p = 0.00) shows great significance at p < 0.01 signifying that the variation explained by the model is not due to chance and that the predictor variable Contract sum of Sub-contract work is valuable in forecasting the Contract sum of the Sub-contract work of a construction project.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.896a	0.803	0.798	57.36855

a. Predictors: (Constant), Contract sum of the sub-contract work.

5. Conclusion

Construction industry involves a large number of professionals that work together as project team for the purpose of successful project delivery in which Sub-contractors are not left behind and this is the major concern of employer. From the result presented above that Technical Capability, Ability to deliver project within scheduled time and Quality of previous job executed was discovered to be the prominent criteria required for the Pre-qualification of Sub-contractors in Construction projects in the order of arrangement, if better productivity must be seen from subcontractor especially because they contribute to the success or failure of a project this must strictly be adhered to. In applying these criteria, Ability to deliver project within scheduled time, Ability to deliver project within cost and Financial Capability was discovered to be the prominent in the application of Pre-qualifying Criteria and it is advised that nothing should make this change no matter who is concerned. Result indicates that there is a statistically significant relationship between construction time and actual construction cost. The R² should not be <50% which means 80.3% represents goodness of fit. There is a great correlation between cost of project and time of completion of project as the model developed reflects a negative constant of -6.078 and the other constant of 0.895 represent the cost of project. The negative constant means when completion time for a project reduces, the cost of project increases which is a normal phenomenon in life.

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