

**COMPARISON OF PERFORMANCE OF TRADITIONAL AND
DIRECT LABOUR PROCUREMENT METHODS ADOPTED
BY THE NIGERIAN ARMY**

BY

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MSC/ENV-DESIGN/01743/2008-09

**A THESIS SUBMITTED TO THE
POSTGRADUATE SCHOOL
AHMADU BELLO UNIVERSITY, ZARIA
IN PARTIAL FULFILMENT FOR THE AWARD
OF MASTERS DEGREE IN CONSTRUCTION
MANAGEMENT**

**DEPARTMENT OF BUILDING
FACULTY OF ENVIRONMENTAL DESIGN
AHMADU BELLO UNIVERSITY, ZARIA**

7 DECEMBER, 2012

DECLARATION

I declare that the work in the Thesis entitled ‘COMPARISON OF PERFORMANCE OF TRADITIONAL AND DIRECT LABOUR PROCUREMENT METHODS ADOPTED BY THE NIGERIAN ARMY’ has been performed by me in the Department of Building under the supervision of Dr. I.H. Mshelgaru and Prof. M.M. Garba.

The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at any university.

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CERTIFICATION

This thesis entitled “COMPARISON OF PERFORMANCE OF TRADITIONAL AND DIRECT LABOUR METHOD OF PROCUREMENT METHODS ADOPTED BY THE NIGERIAN ARMY” by Odey Gabriel Akobi meets the regulation governing the award of the degree of Masters of Science (M.Sc) in Construction Management of Ahmadu Bello University, Zaria, and is approved for its contributions to knowledge and literary presentation.

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ACKNOWLEDGEMENTS

I wish to thank Almighty God for his infinite mercies, love and guidance throughout my studies. My profound appreciation and gratitude go to my supervisors, Dr. I.H. Mshelgaru, Prof. M.M. Garba and M.S. Saleh, for their tremendous and relentless help, advice, objective criticism, contributions, review and comments throughout the preparation of this final work.

My appreciation go to all the academic and non- academic staffs of the Department of Building especially, Prof. K. Bala the present Head of Department, Prof. I. Mbamali, Prof. I.K. Zubairu, Prof. O.G. Okoli and Dr. A.M. Stanley; to mention a few. I thank you all for the love, advice, care and concern you showed me during the period of my programme.

Special salute to the Chief of Army Staff, the Commander Corps of Engineers and Commander 41 Division Engineers for their vision of developing manpower holding of the Nigerian Army (NA) and in particular, the Corps of Engineers through further training.

To my 'Sweetheart', Mrs. Angela Odey and my children, Samuel, Felicia and King David, I cherish you all. You are the "beautiful ones" in my life and the propelling force behind me. I pray that God continues to preserve us all (Amen). I say thank you sir; to my Commanding Officer, Col. J.M. Chima for his fatherly advice and love. No amount of words can be used to describe all the love, assistance, advice, prayers, moral support and concern you showed to me.

I am also indebted to my numerous friends and course mates, you have been wonderful and indeed true friends. God bless you all.

ABSTRACT

The study examined the performance of traditional system and direct labour procurement methods often employed by the Nigerian Army. Traditional system involves the use of professionals from outside the Army to realize a project while direct labour involves the use of professionals within the NA to execute a project. The aim was to find out if one has any advantage over the other. Project success determinants like cost, time and quality formed the basis for evaluation and comparison of the performance of the two methods. Comparison was done based on similarity of projects specifically, the magnitude of work, the type and specifications of work. Fifteen projects made up of ten renovation works and five new projects were considered for analysis for each of the two procurement methods compared. Results indicate that there is no significant difference in the quality of projects procured using either traditional system or the direct labour procurement methods. Further results also indicate that in terms of cost overrun, there is significant difference between the two methods. It was however discovered those overall costs of project were higher for those procured using the traditional system having similar floor area. It was also discovered that significant difference exist between times overrun in the two methods. Projects procured using the direct labour method took more time. The study concludes that there is the need for continuous training and exposure of the in- house professionals to improve their proficiency and efficiency to further enhance the quality of their products.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The early man, knowing the importance of shelter took refuge in caves for his comfort and safety. He went further to scratch, albeit, labouriously at the walls of these caves to make more rooms to meet his needs. Antonio (2007) further stated that, with the passage of time, man began to seek shelter outside the caves using such building materials as bamboo, trees, palm fronds, grasses and soil, both soft and hard. To build his shelter in the early times, man worked on his own house himself assisted by members of his family. This practice was further developed to a stage where other members of the community like age groups would join hands with a member to erect his building while providing only food and drinks. As time went by, and the need for bigger and more complex shelter arose, methods other than this communal practice evolved (Frank, 2005). Construction of buildings is now given to contractors, who take the responsibility of constructing such buildings for an agreed fee.

According to Griffith (2005), project procurement methods are ways by which construction projects are physically realized. They are however different from the various types of contract, which are, legally binding agreement between the parties involved in any construction project after a method of procurement must have been decided upon. Clients' choice of procurement method is dictated primarily by the presumed favourable performance of the chosen method when project success determinants like cost, time and quality are considered (Mojekwu, 2008). The downturn in the economy as experienced in Nigeria among other compelling reasons like project complexity and magnitude has led practitioners in the construction industry to embrace some other methods of project procurement other than the popular contract delivery system. Prominent among these other procurement methods in use

in the Nigerian construction industry are direct labour, design and build, labour only and management procurement (Bamisile et al, 2007). These other procurement methods evolved with the aim of achieving optimal benefit from the available scarce resources especially, where the client can take advantage of their inherent advantages.

Performance is defined as how well a building contract is executed in terms of conformity with specifications, standards of workmanship achieved through curing test and satisfaction with the quality of materials used in the projects (Naoum, 2006). Simply put, procurement method is that method employed in acquiring a project. Ogunsanmi and Bamisile (2007) opined that the procurement of a building project is the process of management of the design and construction of the building from inception to the completion stage. A critical study of the construction industry in Nigeria vis-à-vis the economic situation shows considerable changes in the approach to procurement of projects. Consequently, various methods of project procurement have been devised and developed (Arilesere, 2003). These methods are however not absolute in their application as they all have their advantages and disadvantages. Naoum (2006) however came to the conclusion that more often than not, the traditional system of project procurement provides the datum for comparing the other methods.

Traditional project delivery system involves the appointment of an architect who recommends sets up and leads the design team. The other members of the design team are the engineers, and the quantity surveyor. In this method, according to Ashworth (2001), the architect most of the times take the client's brief and then develops it into architectural form. The engineers then come in for the structural, mechanical and electrical designs and detailed it up to a point where the various elements of the structure can be taken off and worked up into a bill of quantities by the quantity surveyor. After this stage, the builders or contractors

are invited to tender for the construction aspect. Their tenders are examined, compared and the successful contractor is appointed to carry out only the construction aspect of the project under the guidance of the professionals.

Traditional project delivery system was the most prevalent procurement all over the world until the shortcomings of the method started to appear in literature around 1970s (Mojekwu 2008). The major criticism of the traditional method was that, construction works were getting more complex and hence there was need to integrate design and construction being treated as separate entities under the traditional system arrangement. The fragmentation of building projects into two mutually exclusive entities was noticed created room for ineffective communication and coordination, which often result in conflict between the designers and the contractors. Naoum and Langford (2001) stated that fragmentation and project complexity places serious burden on the traditional system of managing building projects. The National Economic Development Office (NEDO, 2002) acknowledged the failure of the traditional method on timely completion of projects in the United Kingdom. Butler (1999) procurement systems such as the direct labour method, design and build, construction management, management contracting, project management and recently, Build-Own-Operate-Transfer (BOOT) are preferred. These alternative procurement systems have been found to perform better than the traditional method in terms of time and cost overruns due to the integration of design and construction.

In Nigeria, Osemenam (2004) confirmed this assertion that "the traditional method leads to long delays in project conception and delivery thus invariably leading to high project cost." However, the construction industry practitioners in Nigeria, despite the known failure of the traditional contract system, still use the method mostly for building project procurement. In a

study of 35 building projects in South-Western Nigeria, Ojo (2002) concluded that the traditional contract delivery system has the tendency to overrun in terms of cost and time by 53.50% and 160% respectively. Also, an analysis of the cost effectiveness of direct labour on 2,772 housing units in metropolitan Lagos by Ogunsanmi (2007) indicated that if the traditional system of procurement method had been used, it could have led to a cost overrun of 36.72% on these projects. However these analyses did not take into account the possible influence of contract cost categories on the performance of traditional system. Despite the earlier criticisms of the performance of traditional system for project execution in Nigeria, the use of this procurement method is in the increase, most especially on residential building projects by public sector clients (the government establishments), which is the largest employer of the construction industry in Nigeria, and some uninformed private sector clients (Ojo and Fagbenle ,2006). Direct Labour method of project procurement is defined as a process by which a project is executed by the workers of an organization instead of the project being contracted out (Opadiran, 2007). It can simply be described as a ‘do it yourself’ approach to project procurement.

Over the years, the Nigerian Army (NA) has had to provide shelter for its men and armament. In place are structures for recreational and training purposes in the various barracks and other designated areas across the country. Additional structures are required to meet with increasing need just as the ones already in place; need to be maintained from time to time (Sadiq, 2008). To meet with these needs, the NA had used either the direct labour method or the traditional system of project procurement. Aliyu (2009) reported in the Journal of Nigerian Army Engineers that the NA procures its direct labour projects through the Nigerian Army Corps of Engineers (NAE). The Corps practice both military and civil engineering. Whenever the NA chooses to use the traditional contract system option, the NAE remains the

body responsible for the effective supervision of the contractors on site (Yakubu, 2009). It is the purpose of this research to study the performance of direct labour and traditional system of project procurement in terms of cost, quality and time for some selected building projects of the NA.

The prominent constraints faced in the traditional method of project procurement as highlighted by Camberlain (2004) are:

- a. That, the method, in comparison with other procurement method has the longest project completion time
- b. That, there are greater coordination and administration costs, incurred by the client in most cases.
- c. That, construction expertise did not benefit design, since there may not have been contact between the Consultant (Designers) and the Contractors before the designs (working drawings) were produced.

In Direct Labour method, Lawal (2007) noted that there may be shoddy attitude to work at times on the part of the operatives who normally work at snail speed, since the completion of the work at hand is necessary but not a compulsory condition for the payment of their wages. Furthermore, compared to workers of established construction firms, there may be inadequate incentives for the workers involved in direct labour procurement. The consequence of this will be adverse and may affect the quality of project.

1.2 STATEMENT OF THE PROBLEM

The traditional system of procurement has been widely criticized as an ineffective procurement method because it often involves time and cost overrun on construction projects

(Odunlami, 2008). Yet the method is still being widely used in Nigeria most especially for the procurement of housing projects. It is suspected that this procurement method may not be ineffective in all cost categories of building projects. Naoum (2006) in his theoretical model for comparing project performance, found that project success of **time, cost and quality** depends on client characteristics, professional characteristics, project characteristics, contractual and management methods. Further works on this theoretical model, led Naoum in 2009 to the conclusion that client's satisfaction with time, cost and quality as well as the procurement method employed, affects the performance of a project.

It is in line with the outcome of these past research works that performance variables like, **unit cost, cost overrun, time overrun and quality ratings** of products will be evaluated and compared to know their performance in the traditional system and direct labour method of project procurement in selected building projects procured by the NA in recent past. The situation today is that, demand far outstrips the lean resources available and a prudent application of these resources is imperative if set goals are to be met. The Chief of Army Staff as stated by Aliyu (2009); on a visit to one of the Army projects site said that “the Nigerian Army Engineers should employ a more effective and viable methods of procuring building projects”, in terms of cost, quality that will enhance performance. A procurement method, which would give a better result in line with set objectives, is no doubt, desirable. This research therefore, pursues a comparison on the performance of direct labour and traditional method of project procurement for NA projects in terms of their cost, time and quality. The purpose of this comparison is to find out whether there is a comparative advantage to be earned by the NA in the use of any of the two procurement methods.

1.3 NEED FOR THE STUDY

At this point of time, Nigeria is experiencing economic problem and the government is advocating careful management of the country's scarce resources. Construction industries seem to be major contributor towards approaching direct labour. Another fundamental concept of direct labour is to restrain the excesses inherent in abuse, mismanagement and misuse of the contract methods by firms. This point is clearly stated that direct labour method of project procurement is perfectly in tune with the national ethic towards providing solution to transparency in project procurements. The major concern in direct labour performance is 'effective' application and presentation of the system. This is the factor that defined the need for the study.

1.4 AIM AND OBJECTIVES

1.4.1 Aim

The research aims at comparing the performance of direct labour and traditional method of project procurement in some selected Nigerian Army building projects with a view to identifying the most advantageous.

1.4.2 Objectives

The objectives of the study are:

- a. To articulate the practices of traditional system and direct labour method of project procurement in relation with what is practiced in NA projects.
- b. To evaluate the factors influencing the performance of the two procurement methods in terms of time.
- c. To evaluate the factors influencing the performance of the two procurement methods in terms of cost overrun.

d. To assess the performance of traditional system and direct labour method of project procurement in terms of conformity with specifications, standard of workmanship and satisfaction with the quality of materials used in the projects.

1.5 HYPOTHESIS OF THE STUDY

The following hypotheses were propounded for the study to guide in the collection and collation of data for relevant statistical analysis.

1.5.1 Hypothesis 1

There is no significant difference in the contributions of identified factors to cost overruns in project procured using the two methods under investigation.

1.5.2 Hypothesis 2

There is no significant difference in the performance of traditional system and direct labour method of project procurement in terms of their conformity with specifications, standard of workmanship and satisfaction with the quality of materials used.

1.5.3 Hypothesis 3

There is no significant difference in the performance of traditional method and direct labour procurement methods in terms of time overruns.

1.6 SCOPE AND LIMITATION

The intensive nationwide recognition given to direct labour system makes it a wide field of study. It is not feasible to cover all state of the nation. The 'research work' was restricted to traditional method and direct labour works executed by Headquarters 41 Division Nigeria Army Engineers in the northern states including Abuja.

The sample will be taken from the multitude of projects which the NA has procured in the last 10 years, from 1999 – 2009. All the building projects procured within this period will be included in the analysis and a representative random sampling will be selected for analysis. Projects to be considered will be chosen from places where the NA has established its presence. The projects to be selected for comparison would be similar in cost and executed within the same period of time. They would either be new construction works or maintenance works. The magnitude of work to be done will also be noted before being chosen for comparison. The groups of respondent targeted for this research work are those who have been involved in the procurement of projects for the NA at one time or the other and the end users. They are mainly officers/soldiers and contractors who have played key roles in these procurement. All the projects that will be used for this research are building projects. They are either bungalows or storey buildings. In line with the objectives set out in this research, primary data will be collected only through files and other documents.

CHAPTER TWO

LITERATURE REVIEW

2.1 PROCUREMENT METHODS

Various methods of project procurement have been used for procuring buildings and other infrastructural facilities. Some of the procurement methods have been critically examined, amended and updated to form standards for clients who intend to build (Fagbenle, 2006). Once a project has been found to be feasible and viable, the client next step is to select the appropriate procurement method he intended to use for the project. This selection of a procurement method by the client is based on experience and or the advice of construction professional either in house or from a private practice (Butler, 1999). The procurement method chosen for a project will determine the relation, obligation and the line of communication between the client, consultants and the contractors as stated by (Ogunsanmi, 2007).

Simply put, procurement method is that method employed in acquiring a project. Ogunsanmi and Bamisile (2007) described the procurement of a building project as the process of management of the design and construction of the building from inception to the completion stage. Ogunsanmi *et al.* however, came to the conclusion that more often than not, the traditional contract method of project procurement provides the datum for comparing the other methods. Ogunsanmi and Bamisile (2007) identified five broad categories of project procurement methods in use in the construction industry in Nigeria: they are traditional contract method, direct labour, labour only or general contracting, design and build, and management contracting. For the purpose of this research work, the researcher is most concerned in the traditional contract method and direct method of project procurement.

2.2 DESIGN AND BUILD

This is a procurement method whereby, the design and construction is done under one roof. Balogun (2002) did describe the design and build method of project procurement as a contract in which a building contractor does some or all of the design work and can produce building very quickly, particularly if the contract was a negotiated one. He went further to state that, design and build may lead to cost savings, if the Builder's practical experience was put to use. Grieson (2008) noted that, the essence of a design and build method of project procurement is that, a single company (firm) takes responsibility for both the design and construction of a project. This, apart from giving one a point accountability to the client, also gives the contractor full control of both major facets (phases) of the project.

Ellis (2010) stated that with design and site work (construction) under one roof, the contractor's knowledge of the building process is released to the design process. It follows therefore, that, those responsible for design and construction are able to see themselves as member of the same team, with a common goal, then, the mutual suspicion and acrimony inherent in the traditional contract method of project procurement is reduced considerably if not completely eliminated. Being members of the same team, they become goal oriented rather than being defensive and protective as they relate with each other, free from the shadows of claims and disputes. The sequence of activities for the design and build method is as shown in Figure 2.1.

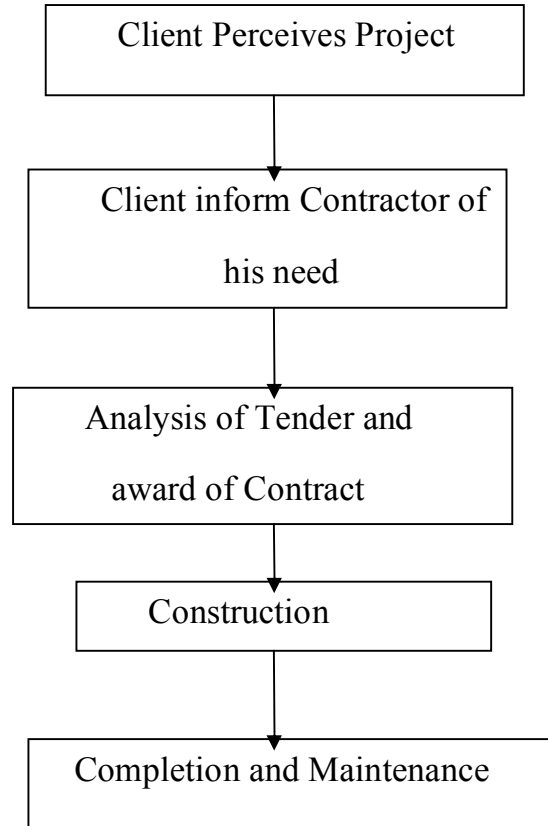


Figure 2.1: Sequence of activities for design and build method

Source: Mojekwe (2004)

The design and build method of project procurement has two variant:

- a. Design and construct
- b. Turnkey or Package Deal.

2.2.1 Design and construct.

This follows from Ishaya (2002); description of the design and build method of project procurement. In this method, the contractor is given performance specifications and drawings, which, although, fully prescribed and predetermined, further works would have to be done on the design to produce a working drawing, which would show all the necessary

details of the construction project. This variant of Design and Build has found great use in the procurement of large industrial complexes, power plants, Civil Engineering projects, etc.

2.2.2 Turnkey or Package Deal

The second variant of the Design and Build method of project procurement is the Turnkey or Package Deal. In this arrangement, the contractor, in addition to designing and constructing the project, may also be involved in site selection and requisition, sourcing of finance, procurement of equipment and furniture, manpower procurement and induction training (if necessary) and many more, depending on the nature of the agreement between the parties involved. Grierson (2008), pointed out that, the concept of a full ‘Turnkey’ situation is one. Where the client simply has to turn the key and walk into an already equipped, ready for use facility – hence the name.

2.2.3 Advantages of Design and Build

Antonio (2002) found the following as the advantages inherent in design and build.

- a. Overlap of design and construction process makes it possible for construction to commence long before design is completed.
- b. Project execution time is shorter, thus:
 - i. Resulting in quick return on investment.
 - ii. Quicker repayment of credit facilities.
- c. One project team as applicable under the method would most likely produce the best solution to client’s problems. This total control would improve quality.
- d. Build to Budget: Design can be tailored to owner’s resources with interplay of financial engineering, budgetary constraints, limitation on expenditure, inflation, interest rates on borrowing and deposit.

- e. Management and coordination of project execution becomes easier for the client.
 - i. The client is easily informed periodically of design and construction programme.
 - ii. The client has constant information and who to reach immediately and the implication of decision changes.
- f. Because contractor was involved in design, he could bring construction experience to bear on the design to prevent problems that may cause delay during construction.
- g. There's a higher level of control on cost and time by the contractor because he has no one to pass the buck to for delays etc, unlike the case in the traditional contract method of project procurement.
- h. Contractor has sub-contractors and suppliers who have worked with him in the past, so, he can push them to meet his cost and time constraints.
- i. Because of the reduced project execution time, considerable cost reduction could be achieved.
- j. Prefabrication of building elements could begin while design work was in progress.

Indeed, Baxter (2000) found that a common feature of the design and build method of project procurement is that, project are delivered on time and at the agreed cost with no quibbles or claims.

2.2.4 Disadvantages of Design and Build

Despite the numerous advantages found to be inherent in the Design and Build method, Antonio (2002) went further to state the following as some of the likely disadvantages of the method:

- a. There's the likelihood that the method may not offer sufficient value for money, since the contractor was the all-in-all on the design board as well as the construction site.
- b. There's the probability that, in order to maximize overall profit, the design solution adopted by the contractor may be sub-standard and not the best or most suitable for the project.

2.3 TURNKEY

The fundamental characteristic of Turnkey contracts is that at completion, the contractor should simply be able to "hands over the keys" to the employer who can then operate the plant in question. Turnkey contracts are typically associated with process or power plants or works with a heavy engineering element and tend to be associated with performance based contracts (Mojekwu, 1998). They typically place most of the risk on the contractor. The main advantages of this method of procurement are single point responsibility by the contractor for both design and construction and the ability to fast track the project. Design and build lends itself more readily to allowing contractors to start on site before the design is completely finished.

This can be important, particularly to government bodies that sometimes need to spend their budget for the project within allocated periods. This procurement method is increasingly common and shares the advantage that most employers and contractors would have experience of it (Eduputa, 2003). The disadvantages of design and build include the loss of design control by the employer. Experience suggests that in an effort to bring projects in on budget design and build, contractors can often compromise on design and this can be a problem for employers. It places a greater responsibility on employers to carefully detail their

requirements without being over to the point where they are effectively providing a design themselves. The client also faces the absence of the contract administrator as his eyes and ears for the project.

2.4 LABOUR ONLY

Labour only method of project procurement is a method involving mainly, the client and the contractor. The client buys the materials required for the project while the contractor is responsible for the actual construction of the project at the chosen site and employs his labour force. Broughton (2005), described labour only method of project procurement as contract for piece works which are prevalent in the smaller building types. In this method, he posited that the owner (client) of the proposed project opts to buy all the building materials needed for the project and a nominated group of consultants (if need be) are charged mainly, with the responsibility of supervising on the client's behalf while the contractor is charged with the task of executing the project at the chosen site.

While agreeing with the view, Bala (2007) found that, this method has now been developed to suit the present economic condition of the country. The downturn in the economy he claimed, with the resultant lean economic resources has forced employers/promoters to expand the scope of its usage to include construction of new projects, primarily as a means of saving cost and yet realizing their set objectives. Tournee and omwanza (2005) submitted that this method of project procurement has found great use in some African countries like; Uganda, Zimbabwe, Botswana, Kenya and South Africa amongst others.

2.4.1 Advantages of Labour Only Method

Followings, amongst others are the reasons that are gradually bringing this method into reckoning. They include:

- a. That, the method could guarantee an appreciable level of cost savings if properly monitored and executed.
- b. It could lead to a saving of time of project delivery.
- c. The contractor may not need to have permanent labour force in his employment.
- d. It offers a high level of satisfaction to both the client and the contractor.

2.4.2 Disadvantages of Labour Only Method

Despite the advantages derivable from this method of project procurement as listed earlier, Butler (2009) found the following as some of the disadvantages one can encounter in the employment of this method on project procurement. They include:

- a. The method is liable to poor standard of workmanship.
- b. The method offers poor working conditions for its labour force.
- c. The method often leads to conflicts, as contractors are always not satisfied with the materials purchased by the client.

2.5 MANAGEMENT PROCUREMENT METHOD

As construction projects become larger and complex, managing such projects equally get more difficult and so, requiring specialized skills of management and approach. Frank (2004) observed that, this method of project procurement sprang up in response to demands for better management of exceptionally large and complex construction projects.

Two variants of this method of project procurement are identifiable. They are:

- a. Management contracting and

- b. Project management.

2.5.1 Management Contracting

Maton (2007) stated that, management is an arrangement where one party (the management contractor) enters into a contractual agreement with another party (the employer) for the management and execution of a project. The contractor's skill in the management of the contract process took primary dominance over the physical execution process to such a degree that he is permitted and required, even, to sublet the entirety of the project's latter process. However, he remains nonetheless, a contractor in a commercial and partisan role. In this method, the role of independent overseer may be undertaken by the consultants or may be sub-sued in the Employer's representative function.

Frank (2004) submitted that the essence of this method was that the contractor undertook to provide the management of the work for a set fee. His fee usually include the cost of the items which appear in the preliminaries bill, in the traditional bills of quantities, items such as site offices, plant, supervisory staff etc, in addition to the services of head office personnel. He does not normally undertake the building work himself, but a subsidiary company within his group (management contractors were frequently among the major firms) may tender in competition with other specialist contractors for one or more of the work packages. The fee the contractor received for undertaking management of the project is usually not directly proportional or related to the value of the work. It is not, for example, charged as a percentage of the whole project. It can therefore, not be said, that, he has anything to gain should the value of the project increase. His fee would, however, be re-negotiated if the extent of work changes significantly.

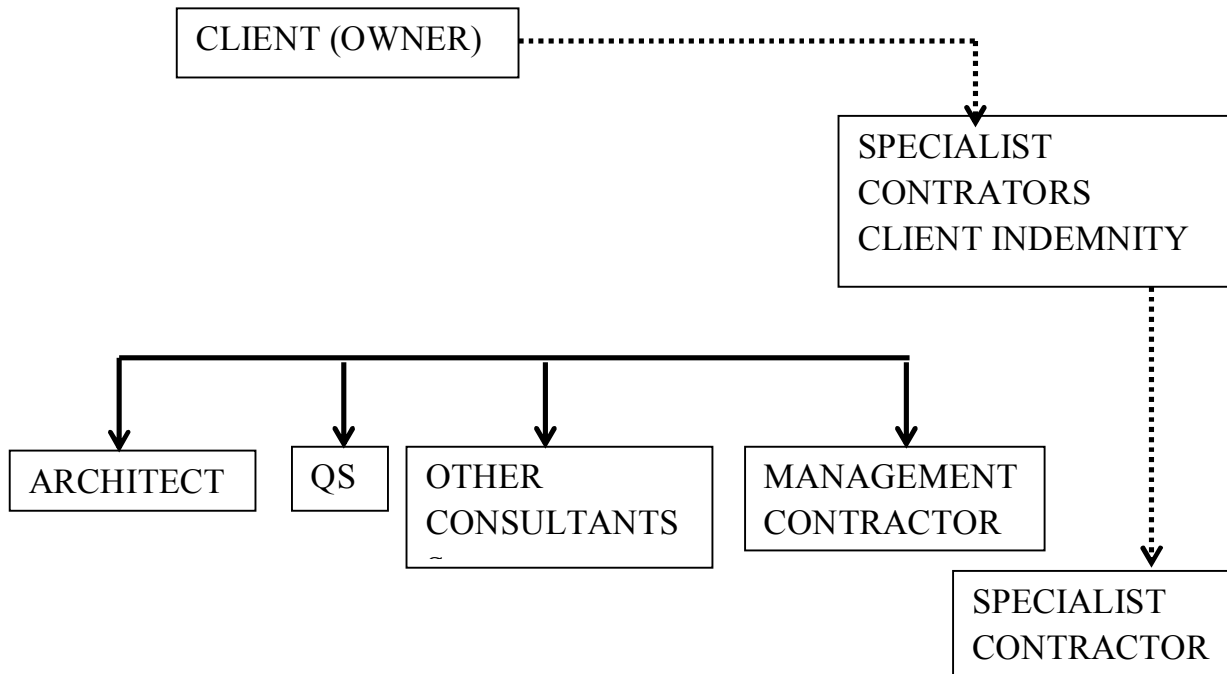


Figure 2.2: Contractual relationship in management contracting method

Source: Mojekwu (2008)

The sequence of activities for this method of project procurement is also shown in Fig 2.3

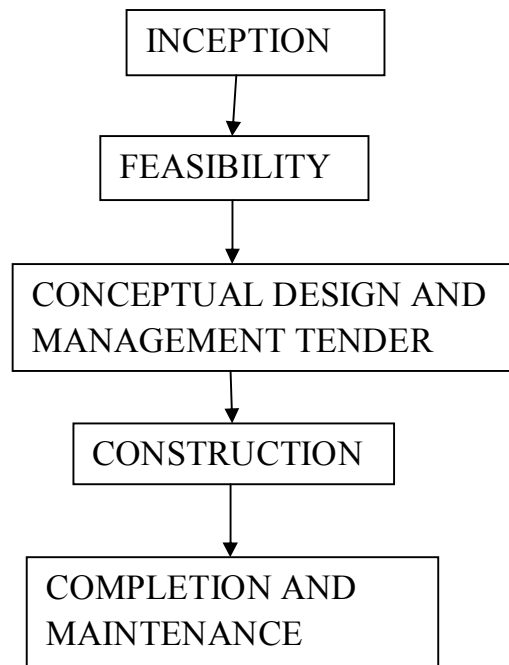


Figure 2.3: Sequence of activities in management contracting

Source: Mojekwu (2008)

2.5.1.1 Advantages of Management Contracting Method

Kettle (2006) stated the following as some of the advantages derivable from the employment of this method of project procurement:

- a. Application of special construction skills with no conflict of interest.
- b. Moderate, owner participation.
- c. Independent evaluation of cost, schedules and construction performance.
- d. Good coordination of construction.
- e. Minimal time for project execution.
- f. Best system to construct a project during a period of rapid changing cost.
- g. Application to any project procurement system if functions are clearly stated.

2.5.1.2 Disadvantages of Management Contracting Method

The following were also found to be the likely disadvantages of the method of project procurement:

- a. Usually, no firm project cost is established in the early stages of construction.
- b. Another layer of responsibility and administrative cost.
- c. Forcing the owner or his agent into position of a referee in settling differences between construction elements.
- d. Lack of fiscal responsibility on the part of the management contractor.

2.5.2 Project Management

Two variants of this method of management procurement method are identifiable in the construction industry; they are the Executive and Non-Executive project management methods. The idea behind the use of project management method of project procurement is to

plan, control and manage on behalf of the owner, the consultants and contractors handling the project.

Project Manager provides a direct service to clients and promoters of construction facilities (Ojo, 2009). He serves as technical and planning arm of the client, ensuring correct interpretation of what the client wants and offering proper planning as well as total control of the project. The Project Manager is basically, the link between the client, consultants, main-contractor and sub-contractors. Eduputa (2003), stated that, the main objective of this method was to apply management skills and techniques to the organization and control of all aspects of a project so as to optimize the use of resources to produce a well designed and constructed facility which will meet the client's requirement. He went further to describe the two types of project management thus:

2.5.2.1 Executive Project Management Method

In this management structure, management was totally separated from the design process and the construction process. A project manager was appointed by the client and he (Project Manager) was the sole contact with the client and acts exclusively as the client's agent in all matters concerning the project and for the integration of all activities of the design and construction teams. Figure 1.5 shows the relationship between the parties involved in this method of project procurement.

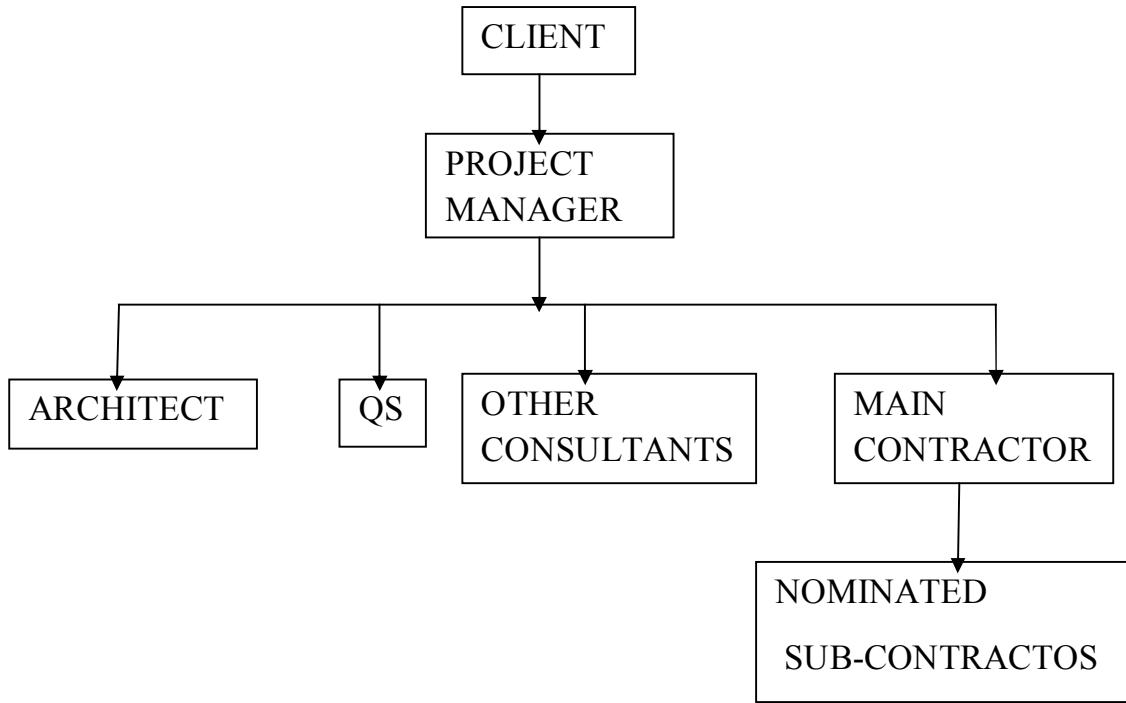


Figure 2.4: Relationship between parties in executive project management method.
Source: Mojekwu (2008)

2.5.2.2 Non-Executive Project Management Method

Eduputa (2003) also described this method as a management system that exists in consortia, Local Authorities etc. In this system, the project manager was at par and similarly appointed as the other professionals. His decision-making role was less than that of the Executive Project Manager and he (the Non-Executive Project Manager) tends to be more concerned with communication and coordination. The final responsibility under this arrangement rests with the consortia or the Authority concerned. Figure 1.5 shows the relationship between the parties involved in this method.

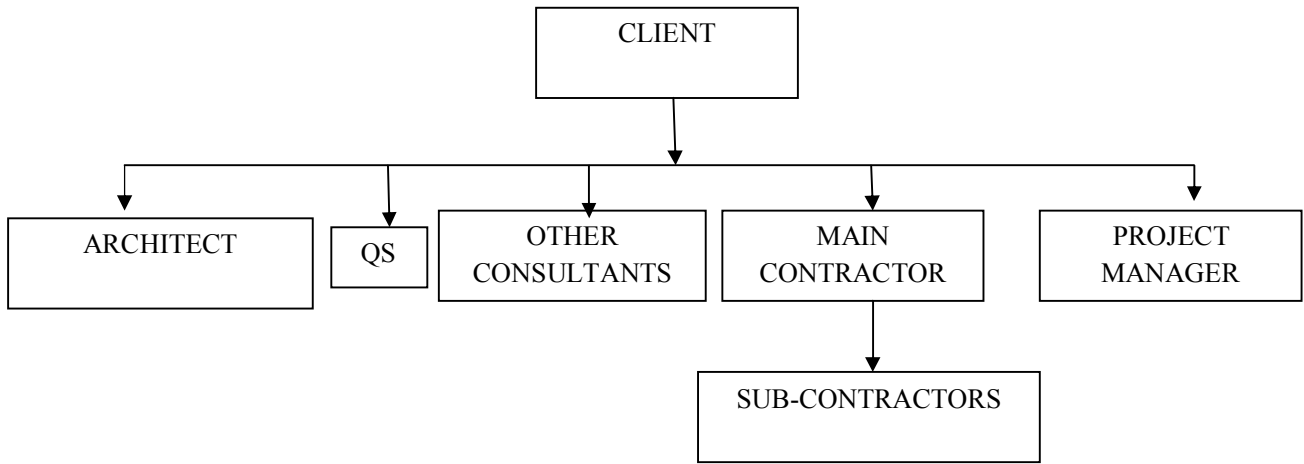


Figure 2.5: Relationship between parties in non-executive project management method

Source: Mojekwu (2008)

2.5.3 Advantages of Project Management Method

The advantages of this system in project procurement were articulated by Camberlain(2008) as:

- a. Project most likely to be completed as scheduled and at a minimum cost to the owner.
- b. The project Manager was able to apply his management and technical skills in controlling cost, time and quality of the project.
- c. The project manager offered expert professional service to the client in order to realize his dreams and procure optimal design and construction for the project.
- d. The project manager relieves the client of the problem of his time and supervision for the project.
- e. The common sight of abandoned projects are avoided because, the project manager had a firm knowledge of the construction industry and the economic situation of the country.

- f. The use of project manager ensures that the project team members perform their individual roles efficiently and in a reasonable manner.

2.5.4 Disadvantages of Project Manager Method

Past studies of this method of project procurement have found that most projects procured using this method that failed, did so, not because they failed to meet technical expectation, but, because they either miss their completion dates or exceeds budget or both. The followings were therefore advanced as the likely disadvantages of this method of project procurement:

- a. Under-Planning of Projects.

The project manager does not plan the project in detail, usually because it was felt that the difficulties of making forecast for the duration and cost of the activities, which make up the project are too great.

- b. Over-Planning of Projects.

A high complex plan was evolved; schedules were cost to the finest degree, so that, when something inevitable went wrong, it was so difficult and costly to change the plan. Alternatively, the pan was changed and the changes themselves consumed so much time and money that once again, the project was abandoned and may revert to the plan-it-back condition.

- c. They were under-communicated.

The professionals involved in the project played their cards close to their chest, usually, because they were apprehensive about exposure to critical colleagues and other participants or because a spirit of competition develops between those individuals or organizations participating in the project.

d. They were over-communicated.

This was a much less common condition, but some clients/project managers believe that the only path to tight control was endless meeting to discuss progress.

2.6 TRADITIONAL METHOD

The traditional method of project procurement is a system whereby the client commissions an architect to take a brief, produce design and construction information, and invite tenders and administer the project during the construction period and settle the final account (Turner, 2007). If the building owner is other than small, the architect will advise the client to appoint consultants such as quantity surveyor, structural engineers and building services engineers. The contractor, who has no design responsibility, will normally be selected by competitive tender or there may be good reasons for negotiating a tender. The design team or independent adviser to the client and the contractor is only responsible for executing the work in accordance with the contract documents, It also covers the situation where the employer employs the main contractor to undertake the construction of the works only, and does not require the main contractor to take responsibility for the design of those works. The main contractor is contractually responsible for undertaking the whole of the construction but will typically appoint several sub-contractors to undertake individual works packages. The design of the works is solely the responsibility of the professional team, who are also employed directly by the employer (Aliyu, 2009). The employer will also appoint his own quantity surveyor, and the architect usually acts as the contract administrator and issues the interim certificates.

This method allows careful planning of the design, the build, health and safety also allows the employer closer control of the works (Baxter, 1999). The risks are that it is unlikely to be the

cheapest method of procurement, there are many points of responsibility and it may need long lead-in times. In this method the Contractor builds to a defined scope of works for a fixed price lump sum. The client retains the responsibility for the design and the project team. The contractor will be appointed normally following a tender process or negotiation and will sign up to a contract for the works.

2.6.1 Advantages of Traditional System

Kettle (2006) listed the advantages inherent in this method of project procurement:

- i. The method is an accepted and historically supported system with legal and contract precedence well established.
- ii. The method allows for the determination of project cost before construction contracts are endorsed by parties involved in the construction.
- iii. The method provides good checks and balances between the client, the consultants and the contractor.

2.6.2 Disadvantages of Traditional System

Griffith (2004) also found the following faults with the traditional method:

- i. Contractors are usually not involved until the start of construction.
- ii. Design changes are often brought in after construction work has commenced at the site.
- iii. Contractors, having secured the job, probably on a lower tender may attempt to make more profits from variations.
- iv. Clients usually have no contractual relationship with subcontractors.
- v. The appointment of subcontractors often takes place after construction has started.

Males and Stock (2008); found that over-emphasis on contractual arrangements rather than an effective organizational problem was the main set-back of the traditional system of project procurement.

2.7 DIRECT LABOUR METHOD OF PROJECT PROCUREMENT

The direct labour method can be described as a system whereby government uses its own resources and expertise to execute its projects or where the client uses his or her in-house human resources to carry out a construction project (Ayeni and Edema, 1988).

Direct labour method of project procurement is a system of project execution where technical civil servants are allowed to be involved fully in the physical execution of government projects. This method of project implementation is not new in the country as it has been in used for executing minor jobs like filling of pot holes of road, repair of broken down machinery etc. It was also practice by the colonial rules (Husseini, 2008). The new things about the method now are the emphasis and the call for direct labour method implementation in both state and federal governments' capital projects, such as buildings, consultancy services, roads and others major capital projects which has always been done by traditional system. The increasing attention concern with the direct labour method of by government and all personnel from all work of life is also new to the implementation of this method in Nigeria (Aliyu, 2009). What is yet alien to implementation of direct labour method of project execution is the intensity with which it is being used nowadays. Furthermore the emphasis of direct labour method of project execution by contractors and professionals alike for the entire abolition of the traditional system is still a new dimension in the implementation of direct labour system.

2.7.1 The Establishment of Direct Labour Method of Project Procurement

The direct labour method has assumed another dimension within the context of the Nigeria construction industries. With the advent of the military rulers, some sets of military officers who had given this slogan a great attention. A new wave is sweeping through the Nigerian construction industry. Suffice to say that our civilization has come a long way into its present socio-economic state. A journey which began through the self-sufficient primitive era transverse to the highly monetize period of oil boom, of different tendering methods, has all of a severe adjustment in every aspect of economic undertaking and indeed, a state of complete self-involvement in project implementations.

The use of direct labour on government project at federal state and local government level is now well established nationwide. For reasons of cost, time, quality and training, it is being used increasingly. In fact, the situation has now led to renewed calls for the elimination of traditional system at all level of government (Dawaki, 2007). Direct labour method is therefore, considered a threat to the traditional system.

2.7.2 Advantages of Direct Labour Method

Both at federal, state and local government with their parastatals, institution and other agencies must have seem the wisdom of executing projects by direct labour method. Thus, they established units and department to achieve the desired goals of getting value for money in addition to their traditional functions of carrying out technical and contract administrations. As already pointed out, direct labour method of project procurement is neither a new concept nor a new philosophy in Nigeria. What is new is the current belief of the contract of the present leadership that it has merit and can gainfully complement the traditional system.

Bukar (2006); identified four major advantages with which direct labour system could broadly be seen and they are:

- i. Generation of employment.
- ii. Promotion of professional competency.
- iii. Elimination of middlemen.
- iv. Cost saving.

2.7.2.1 Generation of Employment

This is achieved through recruitment of additional hands to execute projects. In addition, ministries and parastatals are service organizations rather than profit making organizations in contract with private construction firms. Therefore, one find more people employed in direct labour projects than contracts method, where few staff is employed to save money (Sarki, 2007).

2.7.2.2 Promotion of Professional Competence

Civil servants, by physically executing projects gain experience and proficiency. Because of the past over dependant on the contract system, engineers and other technical staff have had the opportunity to put into practical use the theoretical knowledge acquired in the universities and other institutions. With this, all professionals could come out quite through and confident of themselves.

2.7.2.3 Elimination of Middlemen

This refers to contractors who supply equipment and materials. These contractors are known to deliberately increase cost to maximize profit at the expense of government jobs. If an uneducated contractor can employ hands to execute government job and make profit, trained and experienced servant should be able to execute the same job with greater efficiency.

2.7.2.4 Cost Saving

Here, civil servants are required to purchase materials directly from manufacturers or distributors and execute the project by themselves. This eliminates the cost of labour to be paid to contractors, inflation of prices and other attendant cost. This is evident that there are a lot of benefits derived from the direct labour method of project procurement. If properly organized, well controlled and effectively supervised, direct labour method of project execution has additional benefits.

Other advantages of the direct labour method approach to construction implementation could be explained as follows:

- i. In direct labour method, the very professionals who have been carrying out technical administration now organize and do the job thereby reducing the cost of labour.
- ii. Executing project by direct labour saves time and minimizes cases of abandoned projects with their consequent astronomical escalation in contractual claims. Depending on the availability of funds, such projects can be completed with dispatch with value for money.
- iii. Direct labour system allows the government to proceed with its works at its own pace. In essence, execution of projects may stop when funds are not available without legal complication resulting in tussles which sometimes take years to resolve and hence delaying the project by as many years. In addition, there is no contractual disagreement between client and contractor due to fluctuation which is quite common with contracts nowadays.
- iv. With direct labour, government is able to react more quickly to difficulties arising from design errors and can carry out modification to its design in the

course of construction without having to resort to legal tussle normally required when dealing with independent contractors and consultants.

- v. Since performance ability of the personnel required to execute a project is known to the government, and it is at the same time in control of the stock of materials, project cost is better predetermined with greater accuracy (Dawaki 2007).
- vi. Direct labour system is a good training ground for new entrants like young engineers, architects, builders, quantity surveyors etc because they develop their skill for maximum utilization in the same system later. It will be a major trainer of undergraduates in the Universities, the Polytechnics and other relevant institutions of higher learning.

2.7.3 Direct Labour Method Achievements

The use of direct labour method is now well established nationwide. It is being used increasingly with impressive results. At the Federal Level, direct labour system has brought about tremendous changes in both maintenance culture and execution approach. The Federal Ministry of Works and Housing has, as at January, 1999, maintained 2,076 kilometers of Federal roads (Yakubu, 2009). On capital projects, beautification of headquarters' buildings, completion of government quarters and reactivation of street lighting on some federal roads. The achievement of direct labour system is very much commendable at all states level. In addition to intensification of construction maintenance through direct labour, one finds direct labour units and departments in every state, established in ministries, institutions, parastatals and other agencies, or purposely established to undertake execution of construction projects for the entire state where feasible and available resources permit. Projects so far implemented through direct labour approach include sports centers, industrial buildings, office and

residential buildings (ranging from simple to multi-storey buildings), construction of road networks and bridges, establishment of agricultural farms, rural and urban electricity projects, beautification of state capitals (Lawal, 2007).

In addition, the Directorate of Food, Roads and Rural Infrastructure (DFRFI) intensively advocated the use of direct labour system for the construction of its rural feeder roads. There were laudable achievements to that effect especially in those states of the Federation that have fully adopted the concept of direct labour system (Alabi, 2008). The situation is equally commendable at the local government's level. The success of direct labour is apparently obvious at the local government areas. This is because there is cheaper labour as well as less bureaucratic impact on direct labour machinery at the local government's level. Commitment, collectivism and built in checks and balances amongst the operators of the system is another factor towards the success of direct labour system at the local government's level.

Disadvantages of the direct labour method:

- i. Since there is usually no contractual obligation, projects are sometimes abandoned due to a lack of funds.
- ii. There is usually no standard labour, as would have been the case with established construction firms.
- iii. There may be inadequate incentives for workers involved in direct labour procurement.
- iv. It was noted that there may be a shoddy attitude to work at times on the part of the operatives (Fagbenle, 2009).

2.8 DUE PROCESS AND PROCUREMENT

Based on wide spread corruption, conducting government business degenerated so much by the year 2000. This was due to the fact that no serious attention was paid to Public Service Rule, Financial Regulations and Ethics and Norms because of selfish reasons. The Federal Government noted the urgent need for transparency in government procedures so as to be able to move the system forward. Hence the Federal Government in 2000 commissioned the World Bank to collaborate with some Private Sector Specialists to study Financial Systems and general procurement-related activities in the country. The essence of this request to the World Bank is to assist Nigerian Government “with a process of enthroning efficiency, accountability, integrity and transparency in Government Procurement and Financial Management Systems” (Ekpenkhio, 2003). It was based on this that the Country Procurement Assessment Report was produced through a participatory review approach from key stake holders including representatives from private sectors and the Federal, State and Local Governments with assistance from international and national consultants. The Country Procurement Assessment Report (CPAR) identified some major weaknesses in the procurement system in Nigeria as follows (Ekpenkhio, 2003):

- i. That Nigeria lacks a modern law on Public Procurement and Permanent oversight and monitor purchasing entities
- ii. That the finance (Control and Management) Act, 1958, together with Financial Regulations which set basic rules for managing public expenditure have gaps, deficiencies and faulty implementation of existing regulations on procurement (e.g. lack of permanent arrangements for control and surveillance) which create opportunities for bribery and corruption.
- iii. That due to inflation and lack of regular adjustments on the thresholds of the approving limits of the Tender Boards, their authorization were constantly

being eroded resulting in abuses, prominent among which is splitting of contracts.

- iv. That there was proliferation of tender boards which were perceived by the private sector as sources of delays and non transparency. In addition, these tender boards appeared to have limited mandates with powers to decide contracts *de facto* resting with the permanent Secretary and the Minister/ Commissioner.
- v. That Customs systems and procedures were cumbersome and major causes of delay in clearing goods, and hence a source of corruption; and
- vi. That Procurement is often carried out by staff that substantially lacks relevant training.

Another major problem to the existing procurement system and guidelines in the country is the difficulty of implementation. The reasons for this include absence of economic cost/benefit analysis of projects. There is lack of genuine competition and transparency since applicable rules are usually tilted in favour of a predetermined winner. Most projects are not harmonized and are not selected on priority bases. There are gaps between budget and actual releases, which usually result in under funding, delayed competition, price escalating and abandonment. It is based on the above identified weaknesses that The Country Procurement Assessment Report (CPAR) made the following recommendations (Ekpenkhio, 2003).

- i. The need for a procurement law based on the United Nations Commission for International Trade Model (UNCITRAL).
- ii. The need to establish a Public Procurement Commission (PPC) to serve as the regulatory and oversight body on Public Sector Procurements.
- iii. The revision of key areas of the financial regulations to make them more transparent.

- iv. The streamlining of Tender Boards and the strengthening of their functional authority, including powers to award contracts.
- v. A critical need to rebuild procurement and financial management capacity in the public sector; and
- vi. A comprehensive review of the businesses related to export, import and transit regulations, procedures and practices.

It should be noted that the government “accepted The Country Procurement Assessment Report (CPAR) in its entirety with the exception of the Registration of Contractors and the involvement of political office holders such as Ministers/Commissioners in the award of contracts in excess of fifty million Naira which the report was against” (Ekpenkhio, 2003).

The Obasanjo administration decided to stop the “Business as Usual Syndrome” by establishing the Budget Monitoring and Price Intelligence Unit (BMPIU) in the Presidency. By so doing, the government aimed at formulating and implementing appropriate policies on procurement and contract awards. The Budget Monitoring and Price Intelligence Unit (BMPIU) serves as a “vanguard of ensuring fiscal transparency, strict compliance with Federal Government guidelines on Due Process Certification as it concerns budgeting for and procurement of facilities/services/contracts at appropriate costs. The Budget Monitoring and Price Intelligence Unit (BMPIU) which also addresses the development and operation of procurement of services for Federal Government and its agencies has the following objectives (Ezekwesili, 2005).

- i. To harmonize existing government policies/practices and update same on public procurement.
- ii. To determine whether or not Due Process has been observed in the procurement of services and contracts through the initiation and execution of such projects.

- iii. To introduce more probity, accountability and transparency into the procurement process.
- iv. To establish and update pricing standards and benchmarks for all supplies to government.
- v. To monitor the implementation of projects during execution with a view to providing information on performance, output, compliance with specifications and targets (cost, quality and time).
- vi. To ensure that only projects which have been budgeted for are admitted for execution.
- vii. To ensure that Budget spending is based on authentic reasonable and fair costing.

The mission of The Budget Monitoring and Price Intelligence Unit (BMPIU) is “To use Due Process Mechanism to establish Transparent, Competitive and Fair Procurement System, which is integrity driven, encourages spending within budget and ensures speedy delivery of projects, while achieving value for money without sacrificing quality and standards for the Federal government of Nigeria” For realization of The Budget Monitoring and Price Intelligence Unit (BMPIU) objectives, the government put in place the regulatory functions for regulating standards including the enforcement of harmonized bidding and tender documents, Certification functions for certifying Federal-wide procurements in categories of Resident Due Process Team certification (projects with a threshold of between N1.0 million and N50 million) and Full Due Process Certification (Projects above N50 million at various stages), Monitoring functions to supervise the implementation of established procurement policies and Training and advisory functions to co-ordinate relevant training programme (Ezekwesili 2005). The documents to be forwarded to The Budget Monitoring and Price Intelligence Unit (BMPIU) as requirements for Due Process Review include:

- i. The Project Policy file.

- ii. Evidence of Advertisement as appropriate.
- iii. Tender Returns.
- iv. Tender Evaluation Report.
- v. Contract Award Letter and Agreement.
- vi. Original Contract Bills of Quantities (if any).
- vii. Contract Drawings (if any).
- viii. Other Contract Documents.
- ix. Financial Summary and Statements.
- x. Progress Reports.
- xi. Variation Requests and Variation Orders arising.
- xii. Interim Valuation and Certificates.

However there are some problems which The Budget Monitoring and Price Intelligence Unit (BMPIU) faces. These problems as highlighted by Ezekwesili include; the ignorance and unwillingness of some officials to comply with the provisions of the circulars. Again, at the initiation of some projects there is inadequate project definition and scope definition. Professionals are also not involved in some project packaging and supervision. In other cases there is improper in-house pricing arising out of inadequate continuous professional development. Again, there is in some cases insufficient or inadequate documentation, accompanying requests for certification and delays in responding to issues raised in the draft Due Process Review Report.

It should be noted that Due process and Procurement reforms produced some useful dividends. It resulted in a more transparent, efficient and effective procurement system which creates equal access to bidders of public sector contracts. It leads to increase in Government revenue base by minimizing avenues of wastages and leakages in the economy through

efficient management of government resources. It makes it possible for Contractors and Suppliers to have a fair hearing when aggrieved through filing their protests to a statutory contract appeal Board (Ekpenkhio, 2003). However, it was suggested that to fully maximize the benefits of procurement reforms, that there is need to develop a new cadre of professional procurement officers and contracting officers in the public service for the implementation of procurement reforms. It is also necessary to work out an appropriate scheme of service to be adopted by all the tiers of government for procurement and contracting officers. Capacity building and training (at home and abroad) workshops, Seminars, and Courses, for new cadre of Procurement and Contracting Officers and all those involved in procurement awards should be organized. It is also necessary to restructure Ministries to create cadres of procurement officers and contracting officers in the public service so as to make for uniform implementation and easy monitoring of the procurement reforms. There is also the need to build consensus among the three tiers of government in order to promote the smooth implementation of the procurement reforms by a law which is binding on all the tiers of government. Finally, it should be emphasized that for effective Procurement System through Due Process, a lot still need to be done. There is need for institutionalizing, internalizing and building ownership for the multitude of reforms within the public sector so as to ensure that it sustains the changes in the anti-corruption campaign.

2.9 PERFORMANCE EVALUATION OF PROCUREMENT METHODS

Given unlimited time of delivery, unlimited financial resources and a non-insistence on quality in the procurement of a project, it is certain that any construction professional would execute successfully; any project, using any of known procurement methods; some of which have earlier been highlighted. Nature has however, placed restraints on materials of value as they were never available to meet our wants, but available enough (if well managed), to

satisfy our needs. Clients' choice of a procurement method is determined primarily by the cost of the project, the time of the delivery and the desired quality of the project. These three variables are in essence, the major determinants of project success. A procurement method that would give the best value for money, the earliest time of completion and the highest attainable quality is no doubt the desired choice of most clients, Nigerian Army inclusive.

Turner (2007) submitted that, the design and construction of buildings is a balance, a compromise in the circumstances existing at the time between quality time and cost or put alternatively, product, programme and price. Each of these three constrains, most probably, not always, pull again one or both of the other two. Achieving the balance of product (quality), with programme (time) and price (cost) is emphatically, the challenge of procurement methods. Figure 2.9 (a-d) shows the way, the balance changes from one project to the other depending on the priority of choice on the part of the client.

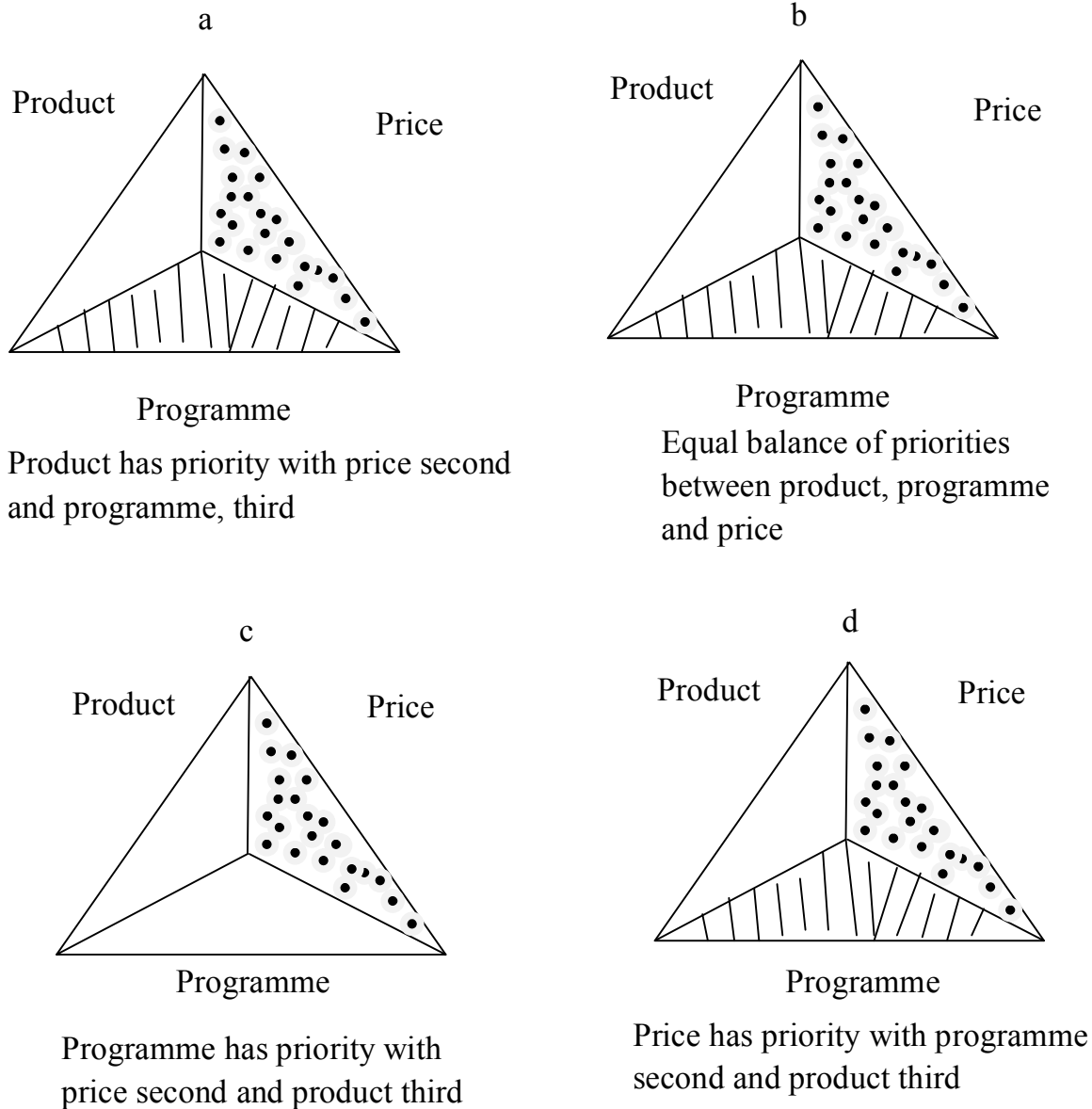


Figure 2.6: The Balance of Product, Programme and Price

Source: Turner (2007)

It therefore follows that, an objective evaluation of the performance of a particular procurement method can be achieved by considering the project cost, overall project time and quality performance of project. For the Nigerian Army though, security implications may take precedence over all other considerations but this is out of the scope of this study.

2.9.1 Project Cost

This could be assessed by comparing cost and cost overruns for the two methods under consideration. Odunlami (2006) postulated a cost saving of up to 25% when the direct labour method is used in a model tender analysis for the repair and modernization of a district hospital as shown in Table 2.1.

Table 2.1: Analysis of Tenders

ITEM	TENDERING CONTRACTOR FIGURE (TCF)	DIRECT LABOUR FIGURE TENDER DISCOUNT TO BE GAINED	DIRECT WORKS BUDGET TARGET
Materials	₦1,480,000.00	Deduct 25% on TCF As materials discount	₦1,110,000.00
Labour	₦850,000.00	Deduct WRA 30% on TCF	₦595,000.00
Plant	₦75,000.00	No hire charges since Own plants are used. Deduct 15% on TCF	₦63,750.00
Nominated	₦1,200.00	Deduct 12.5% on TCF	₦1,050,000.00
Preliminary Items	₦750,000.00	Common Items	₦750,000.00
Risk, overhead and profit	₦650,000.00	Allow 25% of TCF for for incentive etc to DLP operatives and Cost-in-use of plants	₦162,500.00
TOTAL	₦5,005,000.00		₦3,731,250.00

Source: Odunlami (2006)

From the table: % cost savings = $\frac{\cancel{₦5,005,000.00} - \cancel{₦3,731,250.00}}{\cancel{₦5,005,000.00}} \times 100\%$

$$\frac{₦1,273,750.00}{₦5,005,000.00}$$

$$= 25.4\%$$

2.9.2 Overall project time

The various procurement methods perform differently when overall project time is considered. It is however known that, available or non-available of resources plays significant role in the overall project time for any chosen procurement method. The direct labour method is however believed to have some edge here over the traditional method since the tendering process associated with the traditional method is absent. It is known that tendering process take some time from the time of calling for tenders to the time of award of the contract.

Arilesere (2003) summarized the anticipated savings in time and cost when comparison is presented in Table 2.2

Table 2.2: Cost and time savings as anticipated in direct labour compared with the traditional method

DESCRIPTION	TRADITIONAL METHOD (CONTRACT)	DIRECT LABOUR
List and plan of work	Yes	Yes
Preparation of Bill of quantities	Yes/No	Yes/No
Cost estimate	Yes	Yes
Tendering procedure		
Invitation to tender Evaluation		
Of tender choice of contractor	Yes	No
Product/Implementation	Yes	Yes
Profit	Yes	No
Incentive	No	Yes

Source: Arilesere (2009).

2.9.3 Quality Performance

The quality of a project goes beyond aesthetics as functionality and some other requirements must necessarily be considered too. Ellis (2000) opined that quality performance can be measured subjectively as a function of the client's satisfaction in respect of quality. Lawal (2007) supported this view in his work when he said that the objective of quality control is not to produce as high a quality as possible, but to produce a quality that satisfies the customer (client), is as cheap as possible and achievable in a time that meets the delivery requirements. Arilesere (2003) submitted that quality of materials is even more assured with in-house staff because they know that even, long after the defects liability period, they would still be around and defects arising from low quality materials would shown sooner or later.

2.9.4 Theoretical Model

Naoum (2006) in his theoretical model for comparing project performance, found that project success of time, cost and quality depends on client characteristics, professional characteristics, project characteristics, contractual and management methods. This model is as represented in Figure 2.7.

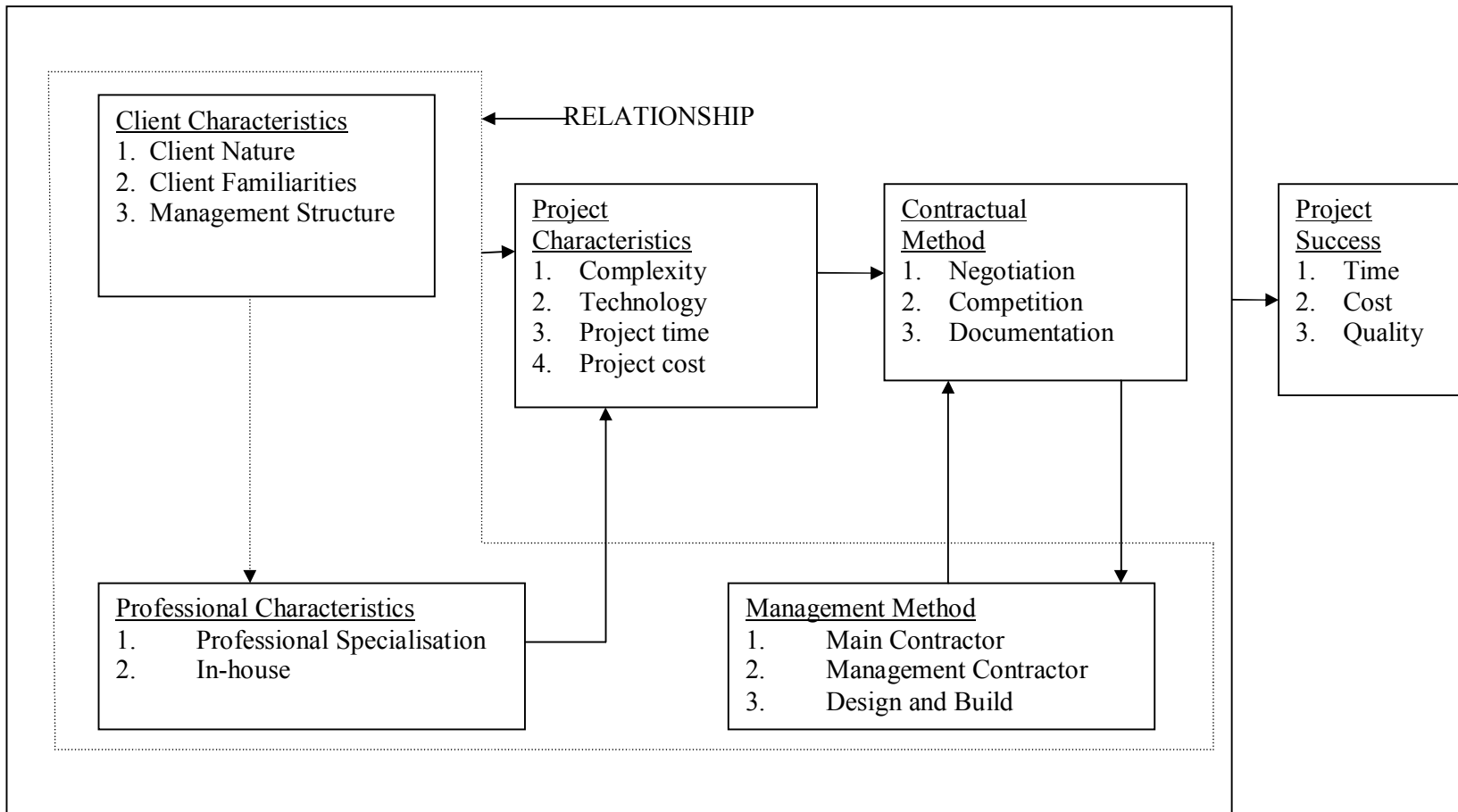


Figure 2.7: Theoretical model for comparing project performance (Naoum, 2006).

Source: Ogunsanmi et al (2007).

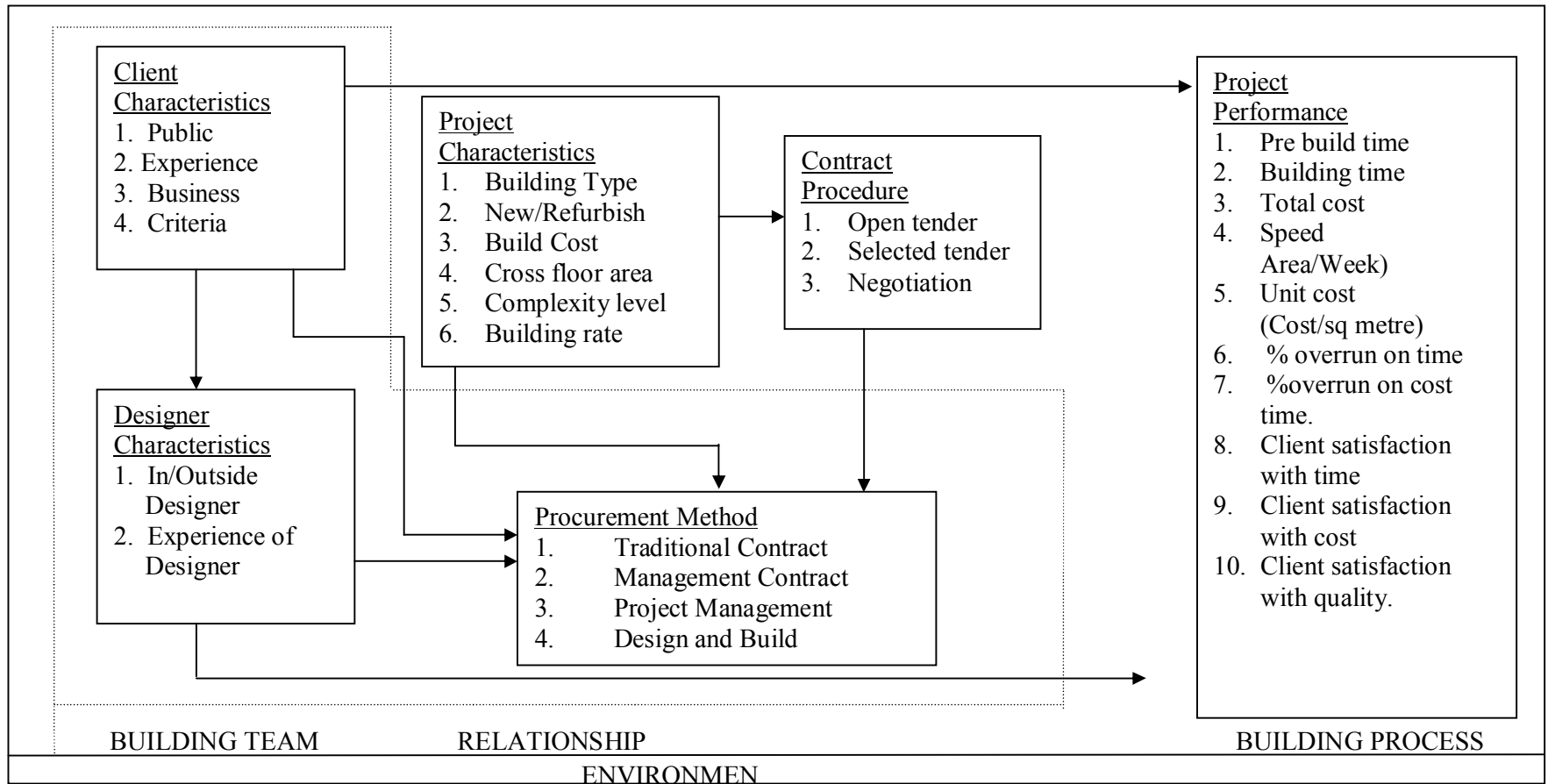


Figure 2.8: Theoretical building process model (Naoum, 2006).

Source: Ogunsanmi et al (2007)

Further works on this theoretical model, led Naoum in 2009 to the conclusion that clients' satisfaction with time, cost and quality as well as the procurement methods employed, affects the performance of a project. He represented his findings in the schematic diagram shown in Figure 2.8 above.

It is in line with the outcome of these past research works that performance variables like, unit cost, cost overrun, time overrun and quality ratings of products is been evaluated and compared to know their performance in the traditional system and direct labour method of project procurement in some selected building projects procured by the Nigerian Army in recent past.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter gives an insight into how the data used for analysis in this research work were obtained, collated and processed to provide answers to the research questions.

3.1 RESEARCH DESIGN

To carry out this research work, the descriptive and survey research design were applied for the purpose of describing and interpreting the existing conditions and prevailing practices. The data used were obtained from structured questionnaires and personal interaction with the respondents to explain terms and clarify issues in the study that may not be clear enough to them. Using quantitative analysis, data obtained from the questionnaire survey were compiled and entered into the Statistical Package for Social Software (SPSS). The use of descriptive statistics produced results which include frequency distribution (represented in Tables and Charts).

3.2 CHARACTERISTICS OF THE STUDY POPULATION

The groups of respondent targeted for this research are those who have been involved in the procurement of projects for the Nigerian Army at one time or the other. They were mainly officers and contractors who have played key roles in these procurements. All of the projects used for this research are building projects. Furthermore, end users of the finished products were also targeted.

3.3 DATA COLLECTION

The primary data was obtained through field survey, using structured questionnaire designed to obtain information regarding the method of project procurement used in realizing their objectives. Research work was obtained through Chief executives of direct labour, Consultants and contractors, staff of Ministry of Defence, Officers and Soldiers of the Nigerian Army. These categories of people are selected because of their years of experience acquired over a period of time and continued involvement in projects execution using any of these procurement methods. Some information was obtained from existing documents of jobs executed by the engineers. These documents include; files, project designs and bill of quantities

3.4 DATA PRESENTATION

For analysis, the descriptive statistical method was used. T-test was used for comparison. Pearson chi-square was used to establish the significance or otherwise of variations in the grouped variables of cost, time and quality which provided the platform for making inferences from the hypotheses.

3.5 ANALYSIS OF RESULTS

For analysis of data, bar charts and tables below are used to show the breakdown of participant interviewed educational background, professional discipline, project category in which a total numbers of twenty buildings are renovation works while ten are new construction and the percentage of each of professional interviewed. The researcher also made use of tables for data presentation and analysis of data to show initial cost, cost overruns, gross floor area and time used in each project.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

This chapter deals with presentation, analysis and discussion of the results obtained from the data generated through structured questionnaires circulated for this research work. Postulated hypothesis were also tested to draw deductions, which led to the making conclusion on the research problems.

4.1 ANALYSIS OF QUESTIONNAIRES

4.1.1 Rate of Response

In carrying out this study, forty structured questionnaires were sent out to targeted respondents. These respondents were professionals and contractors who have been involved in the execution of one project or the other for the Nigerian Army in the last ten years. The contractors were responsible for projects procured using the traditional method whereas; the projects procured by the Nigerian Army through the direct labour method were all executed by the Nigerian Army Engineers. Out of the forty questionnaires sent out, thirty were returned and this gave a response rate of 75% for this study. Based on the assertion of Moser and Kalton (1971), the result of a survey could be considered significant if the response rate is not lower than 30 – 40%.

4.1.2 Respondent's Discipline

Respondents were asked to indicate their professional discipline and the response obtained is shown in Table 4.1.

Table 4.1: Discipline of Respondents

Professional	Quantity	Percentage (%)
Architecture	3	10.0
Engineering	17	56.7
Building	7	23.3
Surveying	2	6.7
Town Planning	1	3.3
Total	30	100.0

From Table 4.1, it is seen that the Engineers formed the largest groups of the respondent; having 56.7%. This is followed by Builders forming 23.3% and Town Planners making up 3.3% of the respondents.

4.1.3 Category of Projects

The research work is restricted to the sample of projects which the NA has procured within the Northern states of Nigeria. Projects considered were similar in cost and executed within the same period of time. From the responses, thirty (30) projects made up of new construction and renovation works were selected as shown in Table 4.2.

Table 4.2: Category of Projects

Project Type	Quantity	Percentage (%)
New	10	33.3
Renovation	20	66.7
Total	30	100.0

Altogether, thirty (30) projects were indentified. A categorization of these projects shows that there were ten (10) new projects and twenty (20) renovation works. However, due to the projects

similarities in terms of initial cost, gross floor area, unit cost and time, fifteen (15) of these projects consisting of five (5) new projects and ten (10) renovation works were thus selected for each of the traditional system and the direct labour methods of project procurement for comparison. The data generated and their analysis is presented in table 4.3 and 4.4.

4.2 PRESENTATION AND ANALYSIS OF DATA

The data generated are as presented and analyzed for the two procurement methods.

4.2.1 Traditional Method

Table 4.3: Projects Procured using Traditional Method

Project	Initial Cost ₦ (M)	Final Cost ₦ (M)	Cost Overrun ₦ (M)	Gross Floor Area	Unit Cost ₦/M ²	Initial Time (Wks)	Final Time (Wks)	Time Overrun (Wks)
TRA	1.80	2.10	0.30	120	0.018	2	3	1
TRB	1.80	1.90	0.10	120	0.016	2	4	2
TRC	1.80	1.90	0.10	120	0.016	2	4	2
TRD	2.10	2.40	0.30	480	0.005	3	5	2
TRE	2.10	2.10	0.00	480	0.004	3	3	0
TRF	2.10	2.10	0.00	480	0.004	3	4	1
TRH	2.10	2.50	0.40	480	0.005	3	4	1
TRI	2.10	2.40	0.30	480	0.005	3	4	1
TRJ	3.20	3.80	0.60	720	0.005	4	5	1
TRK	3.20	3.60	0.40	720	0.005	4	6	2
TNG	4.50	4.90	0.40	480	0.010	10	12	2
TNL	6.80	7.50	0.70	720	0.010	12	14	2
TNM	30.00	36.50	6.50	1200	0.030	22	24	2
TNN	30.00	36.50	6.50	1200	0.030	22	24	2
TNO	30.00	36.50	6.50	1200	0.030	22	25	3

TR = Renovation work procured using the traditional system.

TN = New construction work procured using the traditional system.

Letters A – O = Project numbers.

Table 4.3 shows the presentation and analysis of data of traditional contract method of project procurement. Project TRE and TRF has the same floor area but different unit cost of 0.004 and 0.005 respectively. The difference is negligible hence, no significant difference in terms of cost and time overruns using traditional system.

4.2.2 Direct Labour Method

Table 4.4: Projects Procured using Direct Labour Method

Project	Initial Cost M ₦	Final Cost M ₦	Cost Overrun M ₦	Gross Floor Area (M ²)	Unit Cost M ₦/M ²	Initial Time (Wks)	Final Time (Wk)	Time Overrun (Wk)
DRA	1.10	1.10	0.0	120	0.010	2	3	1
DRB	1.10	1.30	0.2	120	0.011	2	4	2
DRC	1.10	1.10	0.0	120	0.010	2	3	1
DRD	1.50	1.50	0.0	480	0.003	3	4	1
DRE	1.50	1.70	0.2	480	0.003	3	3	0
DRF	1.50	1.80	0.3	480	0.003	3	3	0
DRH	1.50	1.50	0.0	480	0.003	3	4	1
DRI	1.50	1.50	0.0	480	0.003	3	4	1
DRJ	2.10	2.20	0.1	720	0.003	6	8	2
DRK	2.10	2.40	0.3	720	0.003	6	8	2
DNG	3.20	3.50	0.3	480	0.007	12	14	2
DNL	4.50	5.10	0.6	720	0.007	12	15	3
DNM	20.00	25.0	5.0	1200	0.021	24	27	3
DNN	20.00	25.0	5.0	1200	0.021	24	26	2
DNO	20.00	25.0	5.0	1200	0.021	24	26	2

DR = Renovation work procured using direct labour.

DN = New construction work procured using direct labour.

Letters A – O = Project numbers.

Table 4.4 shows the presentation of direct labour method of project procurement. Project DRK and DNL of the same floor area of 720M² has cost overrun of ₦300,000 and ₦600,000 respectively. Project DRK is a renovated work while project DNL is a new works. These however, must have accounted for the difference. However, time overrun is insignificant.

4.3 COMPARISON OF TIME AND COST FOR THE TWO PROCUREMENT METHODS

From tables 4.3 and 4.4, the time and cost of projects using the two procurement methods are represented in pictorial form using the bar chart for easy comparison in figure 4.2 and 4.3.

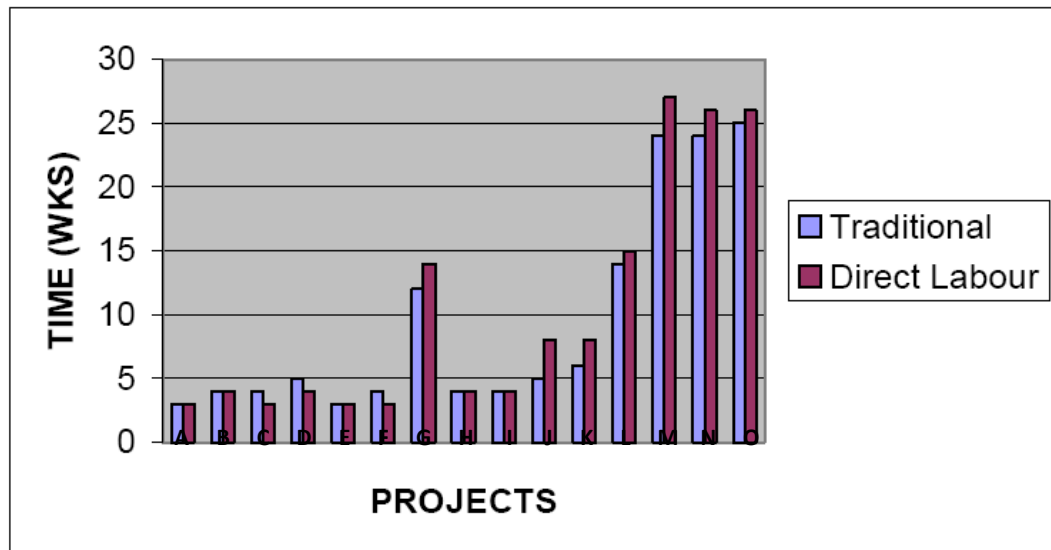


Figure 4.1: Time comparison between Traditional System and Direct Labour methods.

From the bar chart, it is seen that direct labour projects M, N and O takes more time using traditional system in the same projects of equal floor areas. The instances where traditional method took more time were caused by delay in payment by client.

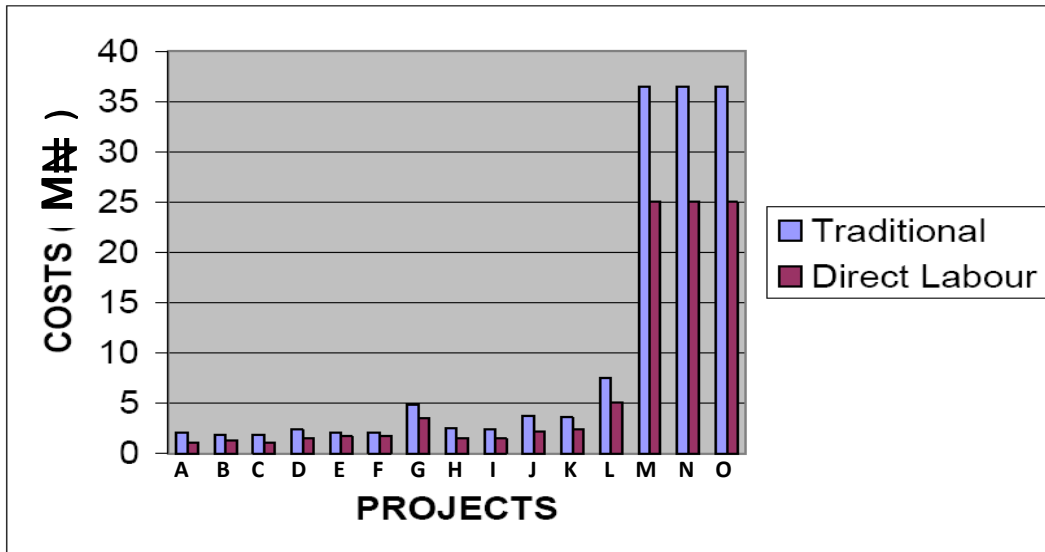


Figure 4.2: Cost comparison between Traditional System and Direct Labour methods.

Figure 4.2 clearly shows that it costs the Nigerian Army more money to procure a project using the traditional contract method than the direct labour method. It is seen for instance that project TNM was procured at a final cost of N7.5 million using traditional method whereas, similar project DNM was procured by direct labour at a cost of N5.1 million having the same gross floor area of 720 sq m. There is a cost saving of 32% in this particular case when the direct labour method is adopted and this is in agreement with Odunlami (2006) submission as cited earlier on cost savings when direct labour method is employed in project procurement.

4.4 TIME OVERRUN FOR TRADITIONAL SYSTEM AND DIRECT LABOUR PROCUREMENT METHODS

Overrun on time and costs for each of the fifteen selected projects are presented graphically for easy comparison.

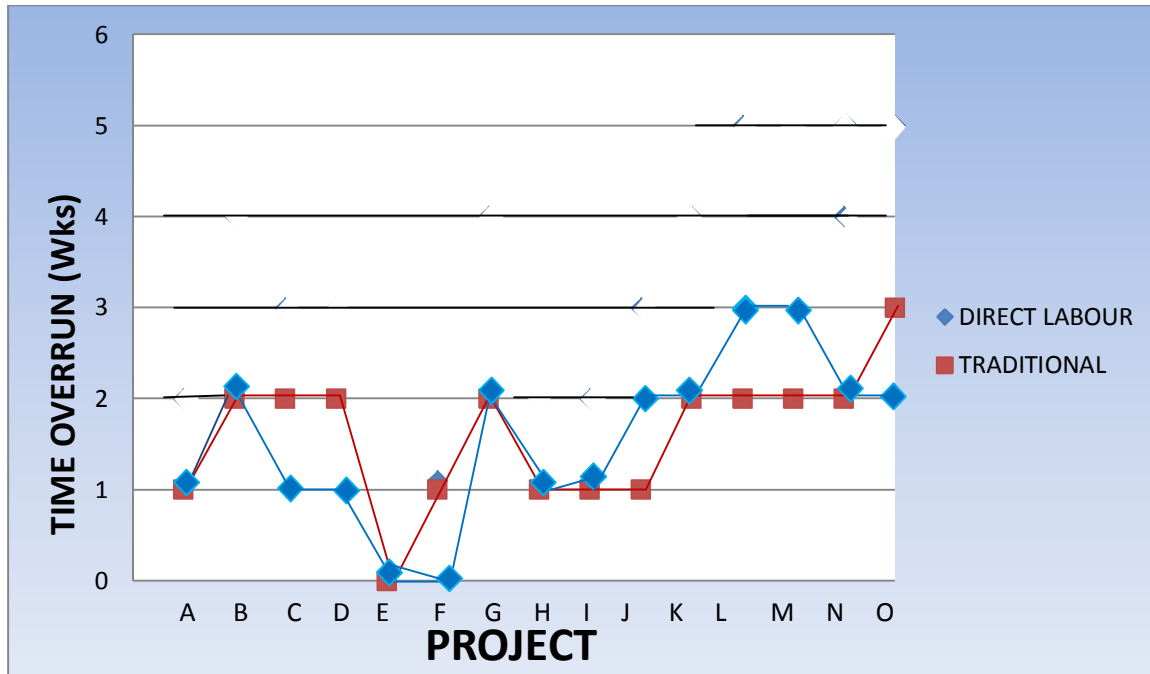


Figure 4.3: Time Overruns for Traditional Contract and Direct Labour methods

From Figure 4.3, it is obvious that the problem of time overrun is more pronounced in direct labour projects as against traditional system.

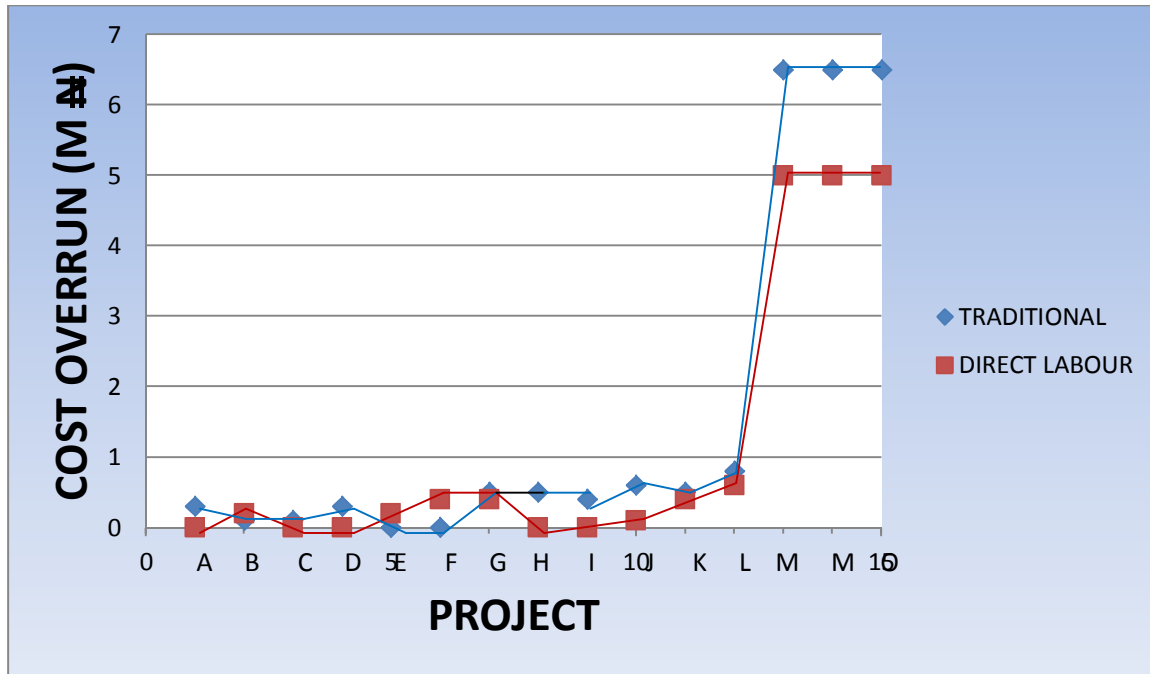


Figure 4.4: Cost overruns for traditional and direct labour methods.

From Figure 4.4 it is seen that cost overrun is lower for projects procured using the direct labour method. The cost overrun of project M of the same gross floor area had ₦5.1 M using direct labour and ₦6.7 M using traditional system of project procurement.

4.5 LIKELY CAUSES OF COST OVERRUN IN TRADITIONAL SYSTEM AND DIRECT LABOUR METHOD OF PROCUREMENT

Factors such as listed in table 4.5 could cause cost overrun whichever of the two methods is used. The response from the respondents on the level of their agreement on how these factors contributed to cost overrun in their projects is presented and analyzed in the table. The mean item score for each of these factors is computed to know their ranking.

Table 4.5: Ranking of likely causes of Cost Overrun

Likely causes of cost overrun	Most likely	Likely	Undecided	Not Likely	Most Unlikely	Mean Item Score (MIS)	Overall Ranking
Rating	5	4	3	2	1		
Lack of proper coordination	3	6	3	16	2	0.55	1
Lack of adequate control	2	9	0	13	6	0.52	2
Changes in scope and quality of work	3	4	1	9	13	0.43	3
Lack of adequate planning	4	2	0	10	14	0.14	4

From Table 4.5, it is seen that lack of proper coordination is ranked first with a mean item score of 0.55 and considered the most influencing factor in cost overruns rather than lack of adequate planning which ranks 4th with a Mean Item Score of 0.41. The implication of this is that a project even when properly planned could experience cost overrun if there is no proper coordination in cause of its execution on site.

4.6 LIKELY CAUSES OF TIME OVERRUN IN TRADITIONAL SYSTEM AND DIRECT LABOUR METHODS OF PROCUREMENT

The factors tabulated in Table 4.6 are some of the likely cause of time overrun in most projects. The effect of these factors on projects procured by the Nigerian Army using any of the two methods are as analyzed using the mean item score to rank them.

Table 4.6: Ranking of likely cause of time overrun

Likely causes of Cost overrun	Most likely	Likely	Undecided	Not Likely	Most Unlikely	Mean Item Score (MIS)	Overall Ranking
Rating	5	4	3	2	1		
Failure to order/purchase Materials as schedule	20	3	1	3	3	0.83	1
Delay due to Subcontractor/supplier's work	11	10	0	3	6	0.71	2
Lack of requisite equipment to Cope with project demand	3	9	0	8	10	0.51	3
Negative attitude of construction Workers	1	2	2	19	6	0.42	4
Inadequate labour force	1	2	0	19	8	0.39	5
Poor motivation of the workforce	2	3	0	10	15	0.38	6
Delay due to inadequate design Information	3	1	0	7	19	0.35	7

From Table 4.6, it is seen that failure to order or purchase materials as scheduled is the major factor that could cause time overrun in the projects with a mean item score of 0.83 rather than inadequate design information which has a mean item score of 0.35. Next to cause delay in project completion time as occasioned mainly by failure to order/purchase materials on schedule is delay that may arise due to a subcontractors work or supplier not making materials readily available at the site when needed which has a Mean Item Score of 0.71.

4.7 TESTING OF HYPOTHESES AND SOLUTION TO SUBPROBLEMS

In order to achieve the objectives of this research work which is the comparison of performance of traditional system and direct labour method of procurement, performance indicators of cost, and quality of product were the main consideration. Variables influencing and determining these success indicators likely to be in conformity with specifications, good standard of workmanship, use of quality materials and application of work scheduling techniques, amongst others were cross tabulated using the Special Package for Social Scientists (SPSS) and the results obtained using the Pearson's chi-square and t-test for comparing traditional contract and direct labour methods are presented subsequently.

Sub Problem 1.

Earlier in tables 4.5 and 4.6 the descriptive statistics carried out on the factors that cause time and cost overruns gave us the ranking of these factors after their mean item scores (MIS) were computed and compared. This sub problem and its hypothesis will now be tested separately for cost and time by cross tabulation of the variables for time and for cost.

Sub-problem 1.1: To determine the difference in the contribution of identified factors that contribute to cost overrun in traditional and direct labour procurement methods.

To test corresponding hypothesis, the following procedure is used:

Hypothesis 1.1

Null Hypothesis, H_0 : There is no significant difference in the contributions of identified factors to cost overrun in traditional and direct labour procurement methods.

Alternative hypothesis, H_A : There is significant difference in the contributions of identified factors to cost overrun in traditional and direct labour procurement methods.

To carry out this test and solve the sub-problem, the identified factors that are likely to cause cost overrun are cross-tabulated and subjected to Pearson chi-square (X^2) test to determine their significance by comparing the calculated X^2_{cal} with the tabulated X^2_{tab} . The outcome of this computation is presented in table 4.7.

Table 4.7 Test Result of Identified Variables to Cost Overrun.

Variable	By Variable	X^2_{cal}	DF	X^2_{tab}	Significance
Lack of Adequate Planning	lack of adequate control	17.663	9	19.023	NS
Lack of adequate Planning	lack of proper coordination	20.821	12	23.337	NS
Lack of Adequate Planning	changes in the scope and quality of work	20.824	12	23.337	NS
Lack of Adequate Control	Lack of proper coordination	30.064	12	23.337	NS
Lack of Adequate Control	Changes in the scope and quality of work	26.443	12	23.337	NS

X^2_{cal} is lower than X^2_{tab} and so, the null hypothesis (H_0) is accepted. There is significant difference in the contributions of identified factors to cost overrun in traditional and direct labour procurement methods.

Sub-problem 1.2: To determine the difference in the contributions of identified factors that contribute to time overrun in traditional and direct labour procurement methods.

Hypothesis 1.2

Null hypothesis, H_0 : There is no significant difference in the contribution of identified factors to time overrun in traditional and direct labour procurement methods.

Alternative hypothesis, H_A : There is significant difference in the contributions of identified factors that contribute to time overrun in traditional and direct labour procurement methods.

The identified factors that are likely to cause delay and hence time overrun are cross tabulated and subjected to Pearson chi-square test to know if the difference between them is significant.

The outcome of this is presented in Table 4.9.

Table 4.8: Test Result of Contribution of Identified Factors to Time Overrun.

Variable	By Variable	X²_{cal}	DF	X²_{tab}	Significance
Poor Motivation of The work force	lack of requisite equipment to cope with project demand	28.192	9	19.023	S
Poor Motivation of the Work force	Negative attitude of construction workers	29.991	12	23.337	S
Poor motivation Of the work Force	failure to order materials as scheduled	8.117	12	23.337	NS
Poor motivation Of the work Force	Delay due to in adequate design information	19.970	9	19.023	S
Poor motivation Of the work Force	inadequate labour force	41.467	9	19.023	S
Poor motivation Of the work Force	Delay due to sub contractor/ suppliers work	11.479	9	19.023	NS
Lack of requisite Equipment to Cope with Project demand	Negative Attitude of construction workers	20.527	12	23.337	NS
Lack of inadequate Equipment to cope With project Demand	Delay due to in adequate design information	21.537	9	19.023	S
Lack of requisite Equipment to Cope with Project demand	Inadequate labour force	24.585	9	19.023	S

Table 4.8: Chi-Square Test Results continued

Variable	By Variable	X^2_{cal}	DF	X^2_{tab}	Significance	Decision
Lack of requisite equipment to cope with project demand	Delay due to sub-contractor/supplier's work	12.973	9	19.023	NS	
Negative attitude of construction workers	Failure to order materials as scheduled	25.846	16	28.845	NS	
Negative attitude of construction workers	Delay due to inadequate design information	16.726	12	23.337	NS	
Negative attitude of construction workers	Inadequate labour force	36.768	12	23.337	S	
Negative attitude of construction workers	Delay due to sub-contractor/supplier's work	10.670	12	23.337	NS	
Failure to order Materials as Scheduled	Delay due to inadequate design information	18.972	12	23.337	NS	
Inadequate labour force	Delay due to sub-contractor/supplier's work	7.437	9	19.023	NS	

There exist situations where X^2_{cal} is higher than X^2_{tab} which makes the difference non-significant. We however reject the null hypothesis and accept the alternative hypothesis, which states that there is significant difference in the contributions of identified factors to time overrun in traditional and direct labour procurement methods. This is in agreement with earlier

deductions from the descriptive statistics where it was discovered that the direct labour method takes more time in comparison with the traditional method of project procurement.

Table 4.9: Chi-square results of the scheduling methods employed

Variable	X^2_{cal}	DF	X^2_{tab}	Significant	Decision
Bar Chart as a Scheduling Method	8.6	2	7.378	S	
CPM as a Scheduling Method	10.0	4	11.143	NS	
PERT as a Scheduling method	7.40	2	7.378	S	

Sub Problem 1.3

To find out the performance of traditional and direct labour methods of project procurement in terms of their conformity with specifications, standard of workmanship and satisfaction with the quality of materials used in the projects. For the purpose of testing the hypothesis, the following procedure is adopted.

Hypothesis 1.3

Null Hypothesis, H_0 : There exists no significant difference between the performance of traditional and direct labour methods of project procurement in terms of their conformity with specifications, standard of workmanship and satisfaction with the quality of materials used.

Alternative Hypothesis, H_A : There is significance between the performance of traditional and direct labour methods of project procurement in terms of their conformity with specifications, standard of workmanship and satisfaction with the quality of materials used.

T-test results for verifying this hypothesis as arrived at using the SPSS is presented in table 4.10.

Table 4.10: T-Test Results of project quality variables.

Procurement Option	N	Variable	SD	t_{cal}	Df	t_{tab}	Significance	Decision
Traditional Contract method	15	Conformity With Specification	0.56	0.303	28	2.048	NS	Accept Ho
Direct Labour	15		0.64					
Traditional Contract method	15	Standard of Workmanship	0.70	-0.887	28	2.048	NS	
Direct Labour	15		0.52					
Traditional Contract method	15	Satisfaction With the Quality of Materials	0.68	-0.487	28	2.048	NS	
Direct Labour	15		0.82					

From the table 4.10, t_{cal} is lower than t_{tab} and so, result is not significant. As a result of this, we accept the null hypothesis (H_0) which states that there is significant difference between the performance of traditional and direct labour methods of project procurement in terms of their conformity with specifications, standard of workmanship and satisfaction with the quality of materials used. This situation may have arisen due to effective supervision given to all projects procured for the Nigerian Army by the Nigerian Army Engineers who usually are the consultants/supervisors when it is traditional method or executors when it is done by direct labour method.

Sub Problem 1.4

To assess the performance of traditional and direct labour methods of project procurement in terms of time and cost overruns.

Hypothesis 1.4

Null Hypothesis, H_0 : There is significant difference between the performance of traditional and direct labour procurement methods in terms of time and cost overruns.

T-test result for testing this hypothesis was obtained using the SPSS and the outcome of the test is tabulated as in table 4.11.

Table 4.11: T-Test Result of the performance of Traditional System and Direct Labour Methods\.

Procurement	N	Variable	SD	t_{cal}	DF	t_{tab}	Significance	Decision
Traditional System	15	Cost	1.0499	-	28	2.048	NS	Accept
Direct Labour	15	Overrun	3.1062	1.071				
Traditional System	15	Time	1.3202	-	28	2.048	NS	Ho
Direct Labour		Overrun	1.6847	1.689				

t_{cal} is lower than t_{tab} which means that there is no significant difference between their performances and so we accept the null hypothesis (H_0) which states that there is significant difference between of traditional system and direct labour procurement method in terms of time and cost overruns.

4.8 DISCUSSION OF FINDINGS

From the questionnaire, it was discovered that more of the projects procured by the Nigerian Army were renovation works. Out of the fifteen projects considered, ten were renovation works while only five were new projects. The two methods have time overruns as seen in tables 4.3 and 4.4 as well as figure 4.1 and 4.3. From all these, it is seen that the direct labour option has higher values of time overruns when compared with the traditional method.

From table 4.3 and 4.4, it is seen that the unit costs of projects procured is lower for direct labour than traditional method. Ranking the likely causes of cost overrun, it was the most likely cause of cost overrun rather than lack of adequate planning with a MIS of 0.41 as shown in table 4.5.

Time overrun was most caused by failure to order/purchase materials as scheduled than delay due to inadequate design information with MIS of 0.35 as indicated in table 4.6. From table 4.8, the most frequently used scheduling technique was the Bar/Gant chart with a MIS of 0.97 while the least used was the line of balance with a MIS of 0.20. The t-test results of project quality variables for the two procurement methods show that there is no significant difference in their performance as seen in table 4.7.

From table 4.8, it is seen that there is no significant difference in time and cost overrun in the two methods. This is most likely due to the fact that most of the projects considered were not of high magnitude. It was however discovered that time taken to execute projects using the direct labour methods was more than the time taken to execute similar projects using the traditional contract method. In terms of cost, the overall cost for the execution of similar projects was more for the traditional contract method of procurement.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This research study dealt with the comparison of the performance of the traditional contract system with the direct labour method of project procurement in some selected projects of the Nigerian Army. The aim of this comparison is to find out whether any of the two methods has a comparative advantage over the other in project procurement by the Nigerian Army. Other methods of project procurement in use in the construction industry in Nigerian were highlighted in chapter two. The method of collecting, collating and analyzing data to test the hypothesis as propounded in chapter one was stated in chapter three. Chapter four was devoted to data presentation, computation, analysis and test of the propounded hypothesis. This chapter which is the concluding chapter will now be devoted to summarizing the findings of this research, drawing conclusions and making necessary recommendations in line with the aim and objectives of this research.

5.1 SUMMARY OF FINDINGS

Findings that emanated from the results of this research study are summarized as follows:

- a. The Nigerian Army has used the two methods of project procurement compared successfully and extensively in its locations spread across the country.
- b. The finding showed 66.7% of the construction projects procured by the Nigerian Army have been mainly renovation of buildings.
- c. Time overrun is experienced more with direct labour project which had mean score of 0.83 than the traditional contract projects with mean score of 0.55.

- d. There is significant difference between the two methods in their conformity with specifications, standard of workmanship and satisfaction with the quality of materials.
- e. The Nigerian Army Engineers lack adequate equipment for better performance.
- f. Security implication was one of the main reasons proffered by respondents for choosing the direct labour method.
- g. There is no significant difference of $26.443 X^2_{cal}$ and $23.337 X^2_{tab}$ in the contributions of identified factors to cost overrun in traditional and direct labour procurement methods.
- h. Time overrun as experienced is not due to lack of adequate planning but due largely to lack of adequate equipment and likely delay due to subcontractor/supplier's work.

5.2 CONCLUSION

Consistent with the findings of this research study, the following conclusion were arrived at:

- a. The direct labour method of project procurement is a cheaper method of procuring projects for the Nigerian Army than the traditional contract method.
- b. The Nigerian Army Engineer would perform better if they have adequate equipment to execute complex projects using direct labour method.
- c. Projects procured using the direct labour method take longer time.
- d. The quality of projects procured using both methods are not significantly different.
- e. There is no significant difference in time and cost overrun in the two methods. This is due to the fact that projects considered were not of high magnitude.

5.3 RECOMMENDATIONS

In line with the conclusions arrived at from this research study, the following are recommended:

- a. For renovation works as observed in most of the projects selected for this study, the Nigerian Army stands a better chance of doing more for the same amount of money by taking advantage of its professionals in having some of the projects done by direct labour method.
- b. Although, time is not of essence for the Nigerian Army in the renovation of its barracks all over the country as it is with an estate developer, there is however, need for a deliberate equipment of the Nigerian Army Corps of Engineers by the Nigerian Army to enable them meet with project delivery.
- c. For projects procured using the direct labour method, there is the need for effective monitoring of the sub-contractors/supplier's work to cut down especially on time overrun as indicated in this study.
- d. There is no significant difference between traditional and direct labour method in procurement. The Army should adopt any of the two methods on different projects when the need arises.
- e. Large and complex projects requiring some specialist input should be procured using the traditional contract method.

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