PROBLEMS AND PROSPECTS OF INDIGENOUS CONTRACTORS IN THE NIGERIAN CONSTRUCTION INDUSTRY.

BY

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NOVEMBER, 1989

DECLARATION

I hereby declare that this thesis has been prepared by me and that it is a record of my own research. It has not been presented in any previous application for a higher degree. All quotations are indicated and the sources of information are specifically acknowledged by means of references.



OWOR, Ngaogute Faustina

November, 1989

CERTIFICATION

This thesis/dissertation entitled PROBLEMS AND PROSPECTS OF INDIGENOUS CONTRACTORS IN THE NIGERIAN CONSTRUCTION INDUSTRY by Owor, Ngaogute Faustina meets the regulations governing the award of the degree of Master of Science in Construction Management of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

To my dear parents:-

Mr. and Mrs. L. A. Owor

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ABSTRACT

The subject of this research is Problems and Prospects of Indigenous Contractors in the Nigerian Construction Industry. The concern of the study is the identification of the major problems that contribute to the below average performance of the contractors as well as a critical examination of their prospects.

The responsibilities of the parties directly or indirectly involved at the different stages of construction project execution, and the management techniques considered relevant for the successful execution of a construction project, were reviewed and served as necessary background information.

A carefully designed questionnaire was administered in conjunction with personal interviews/discussions to the managerial staffs of the indigenous construction firms in Rivers, Imo, Akwa-Ibom, Cross Rivers and Anambra State. Few site visits were also carried out. Information was also sought from Government ministries.

The survey revealed that inspite of the different classifications of the indigenous contractors, each with a speciality of its own, the problems are very much similar. Some of the problems are caused by the contractors themselves while others, are brought about by external forces including the industry's unique characteristics. The identified

problems include: poor finance, difficulty in material/plants acquisition, Government policies, unpatrotic attitude of consultants, bad weather (which applies only to contractors handling projects in the riverine areas) and lack of good organisation. The survey further revealed that the core of the problems that lead to the present criticism of the contractors is that of poor management. The indigenous construction firms also suffer from scarcity of qualified management and technical experts, which could be due to poor educational background. The survey also revealed that the thorough implementation of management techniques is virtually non-existent due to non-familiarity and no perceived benefits of these techniques

A model/training programme aimed at alleviating some of the problems was formulated to enable the contractors appreciate the need and importance of management techniques usage and to serve as the basis for the future.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND:

Before the emergence of the Nigerian Indigenous Contractors, most construction activities were carried out by the Public Works Department (P.W.D.) and the Royal Army Engineers (R.A.E.) which latter, metamorphosed into the Nigerian Army Engineers. The indigenous contractors came into limelight with the introduction of the Nigerian Enterprises Promotion Decree in February, 1972 and have since been playing important roles in the construction industry.

The Construction Industry of today, can generally be said to be the largest Industry contributing to the gross national product, gross fixed capital formation, employment, the provision of social amenities and also the industrial and overall economic development of the Country (Osemenam, 1986; Olaloku, 1987; Wahab, 1987). It is therefore apparent, that there cannot be much progress in the national economy without the basic infrastructural facilities provided by the Construction Industry. Despite these, the Construction Industry has the record of the lowest rate of profit, the highest rate of bankruptcy (Graf, 1980) and subjected to a great deal of criticism.

Recent times which is characterised by a period of gloom and massive foreign debts necessitating the prevailing Structural Adjustment Programme (SAP), have shown a decline of construction activities in comparison with what used to be obtained in the 1970-1980 when it was generally

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assumed that the Nigerian problem was not money but how to spend it. The Construction Industry today is faced with numerous problems which are mostly managerial (Cormican, 1988; Odeyemi, 1988). According to Cormican (1988), companies succeed or fail depending on the quality of their management. If managers make the correct decisions, the organisation is succeeding since it is the management and not the operatives who are ultimately responsible for the success or otherwise of a company.

The present state of the Construction Industry is characterised largely by abandonment and delay of construction projects (Giwa, 1987) hence, Kotey (1986) compared the state to that exhibited in the chaotic motor traffic in Lagos. The spate of abandonment and delay of projects in this country does not project an auspicious image of the client/contractor performance in our economy. According to Akande (1988), the Construction Industry in Nigeria is at a stage where its future is uncertain. The industry is faced with many problems and many Contractors appear to be in serious debts while some are virtually ruined. From the foregoing, one would then wonder what the future holds for the indigenous contractors although Bank-Anthony (1988) asserts that "the building industry has its roots in natural history and as long as human beings continue their search for comfort, the industry will continue to play its role".

It is against this introductory background that the need for this study becomes glaring. The basis for a contract is for all the parties to derive maximum satisfaction from their inputs. Contractors also have to effectively and efficiently execute contracts according to specifications and within the stipulated completion date and cost. The need therefore to find solutions to the problems of the indigenous contractors need not be over emphasised .

1.2 OBJECTIVES:

The objectives of this study are as follows:

(i) To clearly identify the Contractors responsibilities in the different stages of a contract and also those of the other parties.

(ii) To examine the contract system.

(iii) To study the different analytical decision making tools and planning techniques in use in the Construction Industry that can aid effective management operations.

(iv) To survey and analyse the existing practices and hence identify major problems and their causes and also prospects.

(v) To suggest ways of alleviating these problems in order to create a 'tearless', stable and more progressive construction Industry for the indigenous Contractors.

Since the Construction Industry is described as highly competitive and very risky, the broad aim of this research is to highlight approaches to solving the problems of the indigenous Contractors in the industry.

1.3 METHODOLOGY:

In order to achieve the main objectives of this research as outlined in Section 1.2 above, a two-pronged approach was adopted to facilitate and ensure exhaustive survey.

(i) Review of literature on the subject matter;

(ii) Survey and analysis of current practices.

The first approach was accomplished through an indepth study of Construction Magazines, journals, seminar papers and proceedings, newspapers, texts and other publications on the subject matter and related fields. This clearly showed what should be obtained in the Construction Industry in order for the contract aims to be achieved.

The second approach involved oral interviews/discussions and self-administered questionnaires given to only the senior executives of the Construction Industry. In addition site visits were also carried out. The Federal and State Ministries of works and housing and other related ministries were also consulted for further information.

The results of the second approach provided the milieu for the accomplishment of the last objectives (See Section 1.2v).

1.4 SCOPE AND LIMITATIONS:

The focus in this research is on the building and Civil Engineering Contractors since most construction projects in the country are covered within their jurisdiction.

It has not been possible to conduct a survey on the research topic nationwide as is ideal, because of the limitations imposed by time and other resources constraints. However, because of the relative ease of accessibility, five states namely Rivers, Imo, Akwa-Ibom, Cross Rivers and Anambra were covered in the practical survey. Considering the age of the firms, the total number of projects currently executed by the participating firms is quite large (over one hundred). This coverage is arguably, fairly representative of the existing practice and hence the problems and prospects of the indigenous contractors. It should however be noted that not all the problems of the indigenous contractors are covered in this survey.

Finally, only some management techniques considered relevant as planning/decision making tools for the indigenous contractors are covered.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONSTRUCTION INDUSTRY:

In order to fully comprehend the scope of this research, it would be necessary to briefly review the Construction Industry, the environment in which construction Contractors operate and the Contractors/other parties responsibilities.

Some attempts have been made to define the Construction Industry. Diejomaoh (1974) defined it as that which includes residential Construction, industrial and public buildings Construction, Civil Engineering works and the building materials Industry. Adeyemo (1974), in an attempt to define the Construction Industry concentrated on the functional description of its make up. According to him, the Construction Industry is made up of the client, Contractor, Consultant, Material manufacturers and distributors, financial institution and labour force. He further asserts that it includes all those organisations or firms engaged in the erection of dwellings, shops, factories, hospitals and similar public and private buildings including those that specialise in particular sections of the trade like plumbing, installation of air conditioners, electrical wiring, civil Engineering works including roads, bridges and similar structures.

Simply, the Construction Industry can be defined as that sector which undertakes construction works for private or public organisations and also contributes substantially to the national economy. The Construction Industry has always occupied an important position in the structure of the Nigerian

economy and according to Hillebrandt (1974), its importance stems from its characteristics.

2.1.1 CHARACTERISTICS:

It is from the foregoing, that various attempts have been made to characterize the construction Industry and hence its classification. Odepidan (1974), opined that the most important characteristic of the structure of the building Industry in Nigeria is the very wide distribution in the size of the firms. Hence, he adduced that the building concerns in Nigeria might be grouped according to the main character of their work, their location, the number of employees, the annual turnover, the capital resources and in several other ways.

Apart from its general acceptability, this characterization does not hold because the number of employees is a poor measure of size in an activity such as building which is subject to varying sub-contracting arrangements and which is characterised by seasonal variations in employment. Hillebrandt (1974), has a slightly different view on this. According to her, the Construction Industry has characteristics which are separately shared by other industries, but in combination appear in construction alone, making it worthy of separate treatment.

These characteristics fall into four main groups:- the physical nature of the product; the structure of the industry together with the organisation of the construction process; the determination of demand and the method of price determination. Au and Parti (1969) view the characterization of the Construction Industry as a conglomeration of diverse fields that have been lumped together under a common heading for the convenience of

reference. According to them, the diverse and observable characteristics include the following:

(i) It is basically a field of specialisation where each construction company usually chooses to specialise in only one of the categories.

(ii) The optimal position of each company vying to fill the demand in a local market is relatively stationary.

For practical consideration, the broad spectrum of construction activities may be classified into three main categories:- Building Construction - both residential and non-residential, Massive Construction which is subdivided into construction of highways and so forth, Commercial and industrial construction (Au and Parti, 1969; Agha, 1987).

2.1.2 ORGANISATION:

Organisation is the basic structure underlying all management activities. The Construction Industry being a service industry should be thoroughly organised in order to achieve its aim which according to Akande (1988) must be that the employer obtains value for money.

The essentiality of organisation was confirmed by Odepidan (1974) who observed that construction is the ultimate achievement of design, therefore, its organisation has got a purpose namely to produce services efficiently through the systematic grouping of men, materials and equipment in order to make profit. He further emphasized that the Construction Industry's success and efficiency largely depends on its organisational structure, a rational or optimal system of task allocation. He also provided the following summary description of the system:-

> "Given a general purpose of an organisation we can identify the unit tasks necessary to achieve that purpose. These tasks will normally include basic production activities, services activities, co-ordinated activities into individual jobs, to group the job into administrative units, to group the units into larger units and finally to establish the top level departments and to make these groupings in such a way as to minimize the total cost of carrying out all the activities".

The concept of departmentalization designates a distinct area, division or branch or an enterprise over which a manager has authority for the performance of specified activities (Koontz, et al, 1980). The basic purpose of the organisational structure is as clarified by Meredith and Gibbs (1980), that organisation(s) are the natural outcome or mankinds need to co-operate in order to obtain goods and services that would not otherwise be attainable. According to Udy (1959), organisational structure may be bureaucratic or associational as to authority, specific or diffuse but the construction organisations are relatively more likely to be bureaucratic than are organisations carrying on other processes. Illustrated in fig. 1 and 2 are the 'Key Sectors in organisational Design' and the 'Organisational Pyramid' in the Construction Industry.

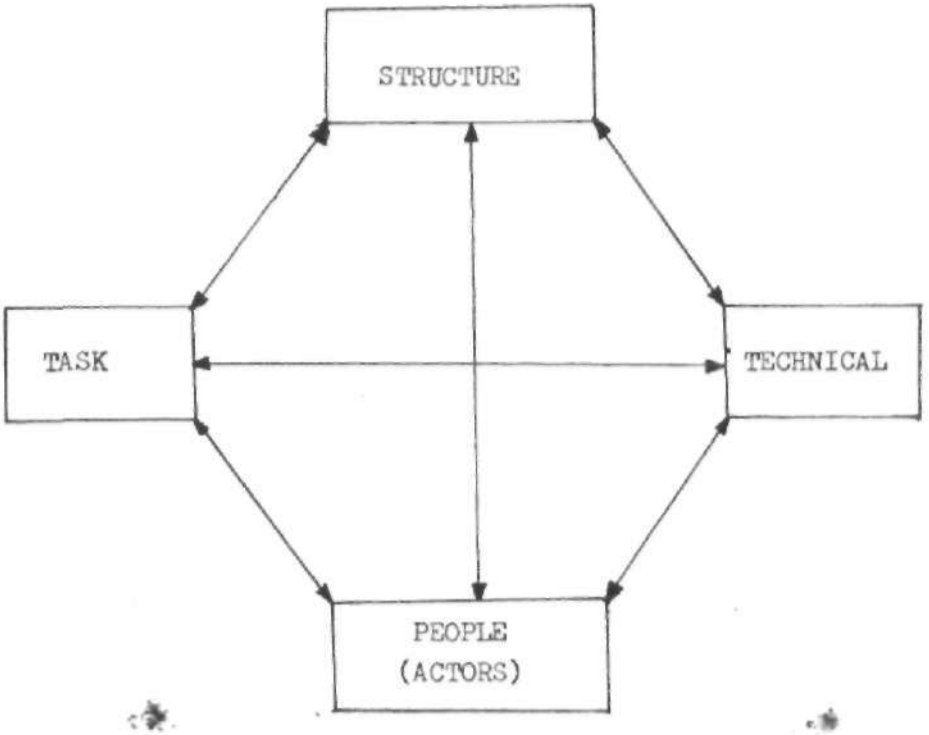
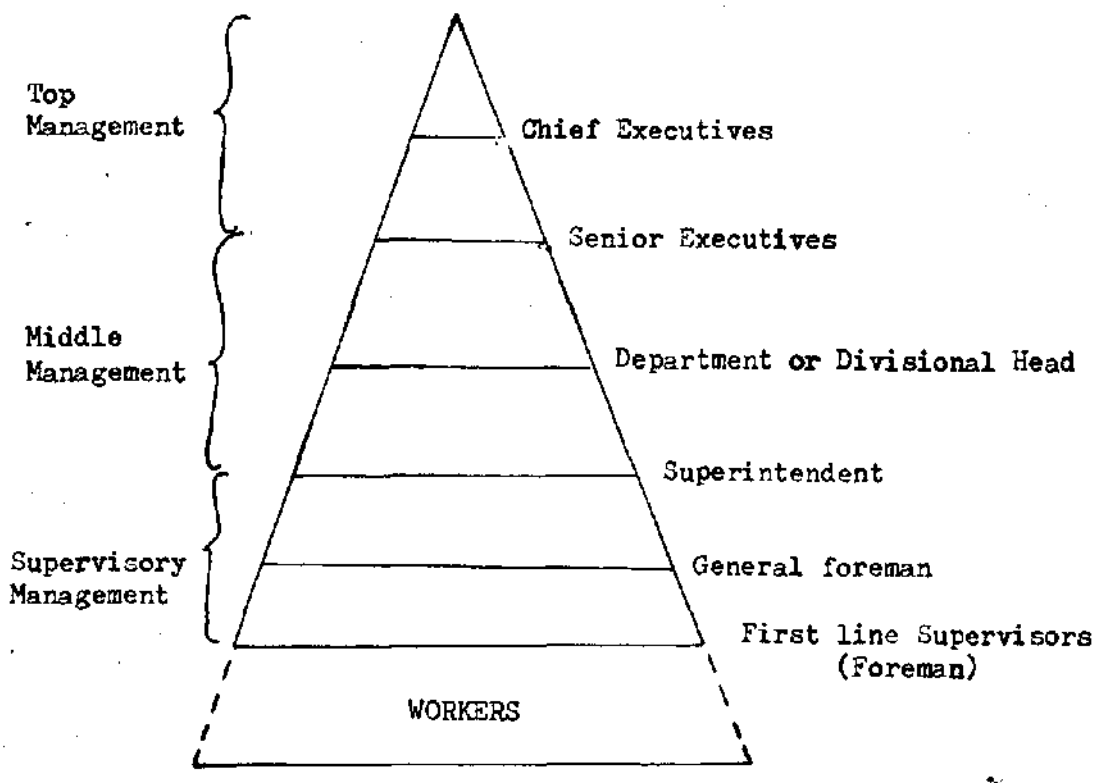


Fig.1: Key Sectors in Organisational Design

(Source: Mcfarland, 1979).

The design of an organisation leads to the achievement of desired goals. The healthy interrelationship between structure, task, people (actors) and technical also leads to efficiency in the Construction Industry. In order to derive optimum satisfaction in the organisational design of the Construction Industry, there must be proper interrelationship and co-ordination between people and structure, the task to be performed and the technical aspects needed.



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Fig. 2: Organisational Pyramid

(Source: Mcfarland, 1979)

The success of any organisation depends on the human participants. This can best be achieved through the setting up of a proper organisational structure to facilitate accomplishment of objectives by people with the minimum unsought consequences or costs. To achieve this, the concept of 'division of labour' where authority delegation and responsibility is employed should be thoroughly implemented, Jaafari (1984). See also Appendix A, a simplified company organisational chart showing the duties of the different departments in the Construction Industry. As indicated in figure 2, there is better co-ordination since any

member of the organisation knows whom he is directly responsible to. Hence all construction organisations must aim to achieve that.

Various attempts have been made at defining Organisation (See Brech, 1975; Miles and Snow, 1978; Mcfarland, 1979), Mcfarland (1979), defined organisation as "the structure or network of relationships among individuals and positions in a work setting and the processes by which the structure is created, maintained and used". Bowley (1966) highlighted that it has been found that the main obstacles to efficiency in the building industry are due to the fact that the Industry is enmeshed in an outworn pattern of organisation. This was further clarified by Jaafari (1984), when he opined that organisational problems are of a high magnitude in the Construction Industry, and that they are as a result of increase in size and complexity of projects, and the unprecedented improvement in design and efficiency of equipment in the postwar year.

According to the foregoing, some of the shortcomings of the organisation are as follows:-

(i) Inefficiency at head office:- This is due to the fact that most Organisations tends to remain virtually unchanged regardless of the fluctuation in workload.

(ii) Confusion and Conflict:- This is inevitable because of lack of unity of command, blurred objectives and low morale.

(iii) Organisational Inertia:- This is also inevitable, both at head office and site levels due to the phenomenon best explained by Parkinson's law, which states that

work tends to expand to fill the time available.

(iv) Resistance to Change.

2.2. CONTRACT PROCEDURE:

Definition of contracts in most literature appear to be entirely in traditional legal terms (See Keating, 1969; Akande, 1988; Ayeni and Edema, 1988). For example, Akande (1988) defined a contract as an agreement that creates an obligation. Its essentials are competent parties, subject matter, a legal construction mutuality of agreement and mutuality of obligation.

According to Ayeni and Edema (1988), the contract documents can vary in formality from a simple form to a voluminous legal document. The form the document takes does not necessarily have to be the same for all works. This was confirmed by Nkado (1987) who highlighted that, the contract documents required and specified by these forms of contract (which include the Joint Contract Tribunal (JCT) standard form of building contract and the Institute of Civil Engineers (ICE) form of Contract for works of Civil Engineering Construction) would depend, on the amount of information concerning the scope of the work available at the time of entering into the contract.

Like any other commercial contract, a building contract is made by an offer by one party to do something in return for a consideration to be paid by the other party and the subsequent acceptance of that offer by the second party.

2.2.1 OBJECTIVES OF CONSTRUCTION CONTRACT:

Seeley (1984) succinctly defines two objectives of construction contracts and they are as follows:-

(i) Defining the agreement of the parties in respect of design, time and cost.

(ii) Providing a sound, definitive, legal and administrative basis for the construction process.

2.2.2 TYPES OF CONTRACTS:-

Many types of construction contracts are currently in use and are discussed in many construction literatures. According to Nkado (1987), there are basically two main types of contracts of divergent characteristics: the fixed price contracts and the cost reimbursement contracts. Variants of these two forms have been developed in order to enhance their applicability under various conditions. The choice of a particular type often depends on the circumstances surrounding a specific project.

The Aqua Group (1982) however enumerated the following types of contracts in common use as follows:

(i) Fixed price contracts, with or without fluctuations, based on:

Performance specification

Specification and Drawings

Schedule of rates

bill of quantities

bill of approximate quantities

(ii) Cost reimbursement contracts

Prime cost + percentage

prime cost + fixed fee

(iii) Target cost Contracts

(iv) Management Contracts

(v) Design/build Contracts

A brief description of these is followed by a review indicating the mode of payment as the determining factor of the type of contract for the client and contractor.

(i) Fixed Price Contract:-

According to Nkado (1987), this in its modified form which includes a provision for interim payments based on periodic valuations and further documents such as the Bills of Quantities, is the most commonly used type of contract in Nigeria. It is one where the contractor agrees to complete a defined package of work in exchange for a sum of money fixed by the contract (Clough and Sears, 1972). If the actual cost of the work should exceed this Figure, then the contractor absorbs the loss. Under this type of contract, the owner (client) is obligated to make only such total payments as is stipulated in the contractual agreement. This type of contract may be either called lump sum or Unit Price Contract (Clough and Sears, 1972; Stillman, 1978; Seeley, 1984; Barnes, 1988).

(ii) Cost Reimbursement Contract:-

The determination of the contractor's fee is usually clearly stipulated in this type of contract. The three

different ways of calculating the fee identify three variates of this contract type as prime cost plus percentage contract, prime cost plus fluctuating fee and prime cost plus fixed fee. Under this contract, the owner or client is obliged to reimburse the contractor for all construction cost and pay a fee for his services (Clough and Sears, 1972).

Traditionally, this type of contract was regarded as one which led to wasteful expenditure on behalf of the client. This view is not now so widely held. This is because, the cost reimburseable contract provides the client, through his project manager, with the greater scope for controlling construction activities.

(iii) Target Cost Contract:

This type of contract is mostly used on projects in developing countries and in other situations where a high total risk, must be allocated between the client and the contractor. The basic arrangement is that, the contractor is paid his actual cost but that his payment is adjusted according to whether the actual cost exceeds or is less than a target set at the beginning (Barnes, 1988).

(iv) Management Contract:

Management contracts may include or exclude design work. It is a type of contract whereby a main contractor is appointed by negotiation or in competition to work closely with a team of professionals and plan, organise and

supervise or manage the execution of the work with the aid of sub-contractors selected in competition by him. The valuations for interim payments for all sub-contractors will be on a similar basis to a fixed price contract. Payments for remaining work follow closely on the line for cost reimbursable contract.

This type of contract is yet to gain popularity in Nigeria.

(v) Design and Build Contract:

This type of contract can also be referred to as 'package deal' or 'turnkey' contract. It basically involves a contractual arrangement, whereby the contractor offers to design and build a construction project for a sum inclusive of both the design and construction costs.

An obvious advantage of this arrangement is that the contractor's knowledge of construction methods can be fully brought to bear on the design decisions with resulting economies of cost and time. Similarly, problems of responsibility for defects are clarified as responsibility for design is not separated from responsibility for construction.

This type of contract could be on a fixed price or cost reimbursement basis, competitive or negotiated and can also incorporate the management contracting system (Seeley, 1984).

Irrespective of the type of contract signed by the contractor, the main responsibility which is achieving the client's desired objectives still remains.

According to Nkado (1987), the most important factor to consider when deciding the type of contract to adopt is the degree of risk or uncertainty surrounding the work. This assertion is not generally held since, other authors like Hollins, (1971); Cooke , (1981), hold the view that it is just one of the most important factors to be carefully handled in order for the contractor to successfully execute his obligations.

2.2.3 TENDERING PROCEDURE:

The purpose of any tendering procedure, is to select a suitable contractor at a time appropriate to the circumstance, and to obtain from him at the proper time an acceptable tender or offer upon which a contract can be let. The tendering procedure used are greatly influenced by prevailing circumstances. This simply implies that a particular situation would require the use of a specific tendering procedure for convenience and best results. However, the success of any tendering procedure depends to a great extent on those concerned.

According to (McCanlis, 1967; Keating; 1969; Seeley, 1977), the placing of contracts can be done by any of the following methods:

(i) Competition (Open tendering or automatic selection method)

(ii) Negotiation with a selected contractor (subjective Selection method)

(iii) Selective tendering.

Normally, forms of tender are sent out with the conditions of contract. The contractor then estimates the cost of the works on the basis of the amount of works, and materials shown on working drawings and described in the Bill of Quantities and Specification. Other tender documents include the form of tender; schedule of basic prices of labour, materials and plant charges and daywork; a form of questionnaire and specially marked envelope for submission of Bills of Quantities and tender form containing the tender sum. Thereafter, the contractor forwards his estimate (tender). The assumption underlying the submission of a tender is that it is an offer capable of acceptance. In order to arrive at this, the contractor executes his responsibility in the pre-tender stage of a contract. Briefly, a review of the contractor's responsibilities in order to arrive at an offer (tender) follows:-

2.2.3.1 The Pre-tender Stage:

Hollins (1971) adduced the objective of this stage as that which reduces or eliminates the risk of inaccurate opinions influencing decisions which affect the pricing of the estimate.

Attempts have been made by various construction literature to highlight the activities involved at this stage in the contractor's Organisation (See Hollins, 1971; IOB, 1973; Cooke, 1981; Oxley and Poskitt, 1980). For example, IOB (1973)

categorised the activities involved in this stage as follows:

(i) The decision to tender

(ii) Collection of information

(iii) Preparation of information

(iv) Tender

(v) Action with a successful tender (See Section 2.2.5.)

The decision to tender is a relatively straight forward one made by the management and usually includes a number of factors (See the foregoing authors), but essentially, the most important factors include: the type of client/consultants; the location/nature/value of the proposed site; the available resources of the firm; available information from tender documents and market conditions.

The process of collection of information includes detailed examination and understanding of the contract drawings and tender documents, visit or visits to the proposed site and its locality, enquiries to sub-contractors and suppliers, estimating programme and construction method preparation.

According to the IOB (1973), the preparation of the estimate comprises the following: Establishment of all -in rates of key items; use of the established all-in rates and production standards to calculate unit rates for the Bill of Quantities items; the preparation of reports for management consideration.

Thorough care at this stage is necessary, although it might be contended that, a realistic estimate can be prepared without a systematic implementation of the foregoing steps especially for an experienced estimator and where the project falls within the categories usually executed by the firm and is in a well known locality. But, Nkado (1987) highlighted that the pitfall involved is that no two projects are entirely similar, so collection of information, however cursory could very well alleviate major estimating errors.

2.2.4 CONTRACT AWARD:

Tender submitted for most works are cross-checked for errors and appraised by the Consultants. Recommendations on each tender is passed to the client. However, the client is not bound to act on such recommendation. He is at liberty to use his discretion in making the award.

The basic factors usually considered in making contract awards according to Creswell (1957) can be summarized as follows:

(i) Sufficiency of the tenderer in resources. These include financial, personnel and material resources.

(ii) The number and magnitude of projects a contractor is currently handling. This is to enable the client determine the extent an additional award of contract

will stretch the contractor's resources thereby hampering his expected performance.

(iii) The credibility of the contractor based on his past performance on similar project with the client or elsewhere.

(iv) The category/grade of the contractor's registration. This however does not often apply when the project is complex in nature and requires special skill.

(v) The quoted tender figure and project duration.

According to McCanlis (1967), the basic factors involved after the award of the contract are as follows:

- Obtaining from the selected contractor a firm offer that is acceptable as a basis for contract
- Establishing the terms and conditions of a contract with the selected contractor.

Thereafter, the contractor strives to achieve the clients objective. Briefly a review of the contractor's responsibilities at the pre-contract and contract stage follows:

2.2.5 THE PRE-CONTRACT STAGE:

A contract is a commitment. Hence, once the contractor has accepted this, he must review the information available to him and establish his plan. For the actions with a successful tender, See Appendix B. In any organised construction firm, detailed planning ofconstruction activities according to Butler (1979) is carried out during the pre-contract period by all those who are critically involved in

the project under the supervision of the project manager, who by virtue of his post is versed in construction planning and scheduling.

Cooke (1981) highlighted the activities at this stage to include the following:

(i) Pre-Contract arrangement prior to commencing a project

(ii) Appointment of sub-contractors and suppliers

(iii) Availability of information requirements and resources

(iv) Preparation of master programme

(v) Decision relating to financing of the contract

From the foregoing, it becomes apparent that for a successful project implementation, the management must devote a disproportionately large amount of time, effort and expertise to the planning phase since according to Hollins (1971), failure to plan properly before work starts invariably delays completion and involves heavy additional cost.

2.2.6 THE CONTRACT STAGE:

This is carried out as work progresses on site. According to Cooke (1981), the activities involved at this stage include the following:-

(i) Monthly planning review

(ii) Weekly or short term planning

(iii) Daily Planning

(iv) Monthly and weekly reports of progress (this includes site/progress meetings).

(v) Updating of progress and comparison of budget with performance.

The objectives/aims of this stage are illustrated in the figure below.

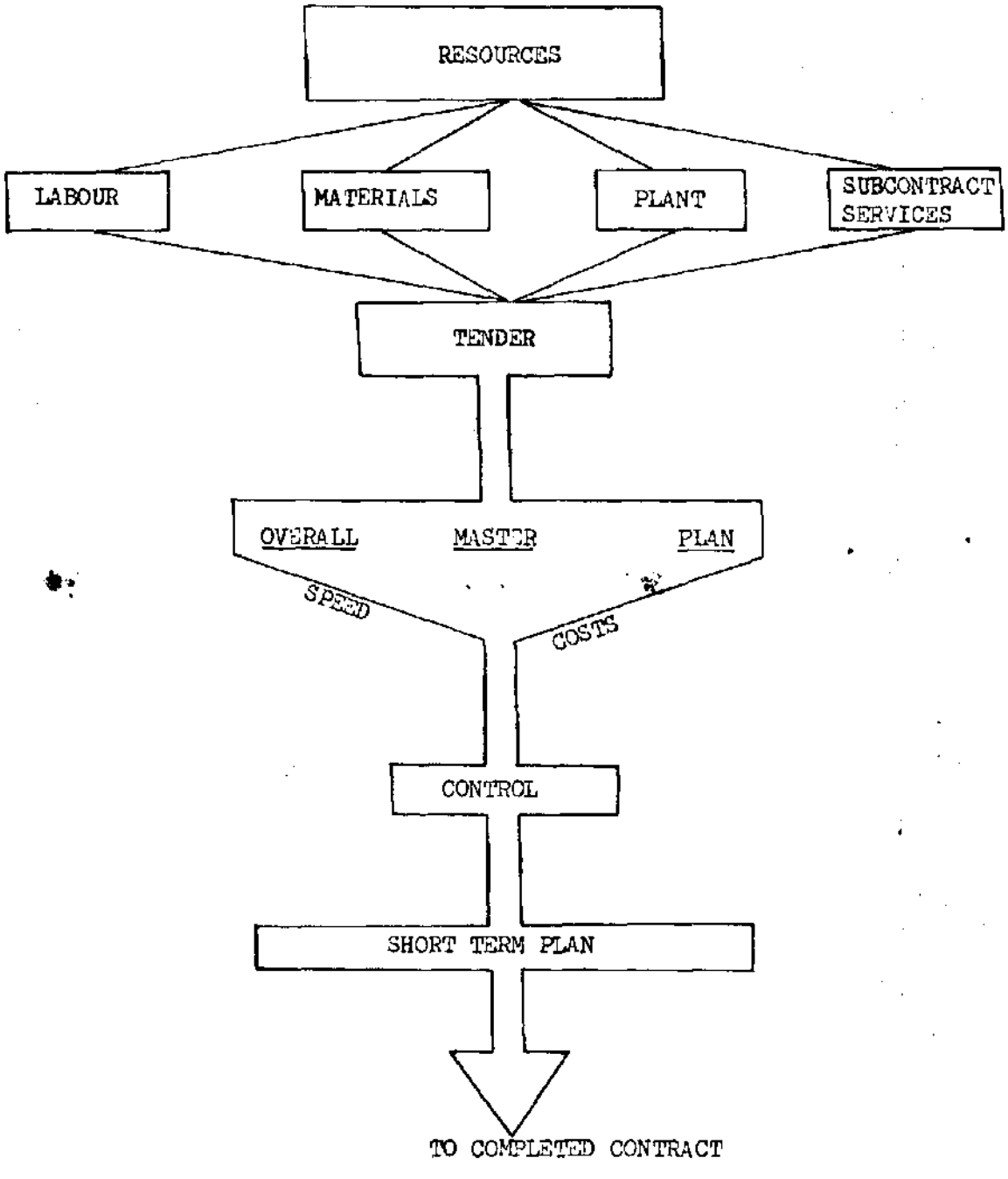


Fig.3: Aims of Short Term Planning
(Source:- Hollins, 1971; Page:- 95).

2.3 THE CONTRACTOR'S OPERATIONAL ENVIRONMENT

Various literatures have tried to define who a contractor is (See Keating, 1969; Clough and Sears, 1972). For example, Clough and Sears (1972) defined a Contractor "as the firm that is in contract with the owner for the construction of a project, either in its entirety or for some specialised portion thereof". According to (Armstrong, 1980; Owor, 1988), Contractors can be generally classified as Large, medium or small depending on their operational levels. The basic contractual structure is as shown in figure 4 including the materials and equipment vendors, the labour supply and Sub-contractors and the financial institution.

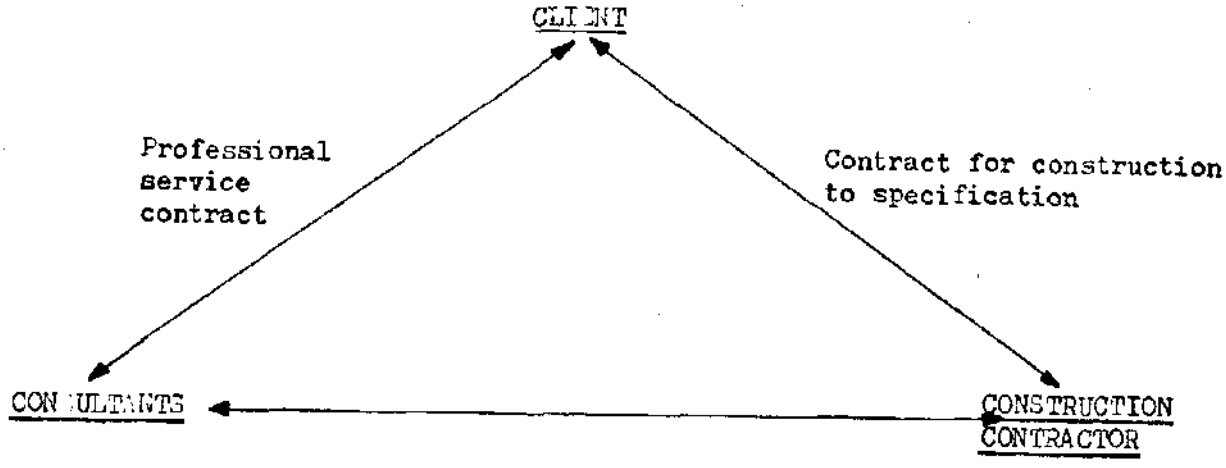


Fig.4:- Modified Contractual Structure

(Source:- Reve and Levitt, 1984; Page:-23)

2.3.1 THE CONTRACTOR - DESIGN FIRM RELATIONSHIP

It has been adduced that design and construction are very important phases in the Construction process, Baldwin and Manthei, (1971), hence, the parties to the contract must work together to achieve the ultimate aim of construction. Lack of good co-operation would hinder the progress of work on site. This was further confirmed by Owette (1988) who asserts that the inefficient management of construction work on site could be attributed to incompetence on the part of the contractor and lack of flexibility on the part of the consultants.

Stillman (1978) summarized the relationship that should exist between both parties as follows:-

> "The Architect and his representative should (and usually do) try to co-operate with the contractor from the start of a project to its conclusion. However, co-operation is not a 'one-way street', it demands equal effort from both sides. Thus, if a contractor is deviating from contract documents or from general good practice the Architect must take decision action. In short, a construction project embraces the combined efforts of several teams. If each team, does it best at all times, so that the owner is well served, then the work of each team will be lessened to the essential gain of all concerned".

The Architect has the responsibility of presenting the contractor's certificates to the client for payments to be made as stipulated in the contract conditions.

2.3.2. THE CONTRACTOR - SUB-CONTRACTOR RELATIONSHIP

Sub-contractors can and often play important roles in achieving project time and goals. Hence, the contractor must establish good working relationship with them.

According to the Aqua Group (1981), many problems that arise on the building contrqcts are due to the difficulties arising from the liaison between the contractors and sub-contractors.

The management control of sub-contractors centre about getting them on the job when they are needed and insuring that they accomplish their work in accordance with the established job schedule. Clough and Sears (1972), have the view that for a contractor to effectively achieve his goals, three main considerations are involved:-

(i) The Contractor should consult with each of the major Sub-contractors during the planning and scheduling of the project.

(ii) The form and content of the sub-contract agreement would enable the contractor have better enforcibility on the Sub-contractors.

(iii) The contractor ensuring that the sub-contractors order their major materials in ample time to meet the Construction schedule.

2.3.3 THE CONTRACTOR - MATERIAL VENDOR RELATIONSHIP

Materials and components used on site account for rather under one-half of the total cost of construction (Hillebrandt, 1974), hence the necessity of ensuring the existence of good relationship between both parties.

Where this does not exist, construction work could be unnecessarily delayed. Hillebrandt, 1974 confirmed that, possible reasons for cost variations might be caused by shortage of materials or late deliveries. In Nigeria, about 75% of materials used in the Construction Industry are imported either as raw materials or as finished products (See Appendix C) hence, Olaloku (1987) adduced it as one of the problems facing the Construction Industry.

2.3.4 THE CONTRACTOR - EQUIPMENT VENDOR RELATIONSHIP

By far, the greatest challenge facing the contractor is that of equipment acquisition and management (Agha, 1987; Olowo-Okere, 1988). The oil glut which has brough about an acute shortage of foreign exchange has made the procurement and maintenance of heavy construction equipment in this country a near impossible feat. However, due to the non-availability which according to Anekwe (1987) is on of the reasons for the poor performance of contractors, the contractors have the responsibility of managing the few available and also keeping good working relationship with those plants and equipments are hired from, in order to ensure efficient execution of the project.

2.3.5 THE CONTRACTOR - CLIENT RELATIONSHIP

The Contractor and Client of a project have a lot in common. Therefore, a good relationship between them would ensure that the ultimate aim of construction is achieved. This was further confirmed by Massman and Cox (1971), when they highlighted that nothing can be done in isolation in the construction industry.

The good co-operation from both parties would further enable the objective of the contract which includes client's satisfaction, within the budgetted cost and time to be achieved.

Owor (1988) highlighted that in Nigeria today, a careful study of the most successful contractors show that they have had good working relationship with the clients. Without this, work could be un-necessarily delayed, project costing too much and even the required standard not being achieved. However, the responsibility does not lie solely on the contractor since an owner active in most project activities would tend to promote better project management and co-ordination between the parties, generally resulting in more effective project execution.

The conditions of contracts usually make provision for the contractor to be paid at specified intervals for work done and the client should adhere to this in order to prevent or reduce projects abandonment (Nkado, 1987). The client is obliged to make payments on presentation of the interim certificates, certificate of practical completion of the work, completion of the contract certificate and finally the final certificate by the Architect. For details, See the JCT (1980) and ICE Conditions of Contract. The final certificate is issued by the Architect only after the final account has been prepared by the Quantity Surveyor. The final account preparation takes note of all the

variations and claims, fluctuations in rate of labour and prices of materials (if applicable), remeasurement of provisional quantities in the Bill of Quantities, nominated sub-contractors/suppliers account. If there were no new instructions to the contractor, after the contract award, there would be no variations (as shown in the figure below). But, this rarely occurs in Nigeria.

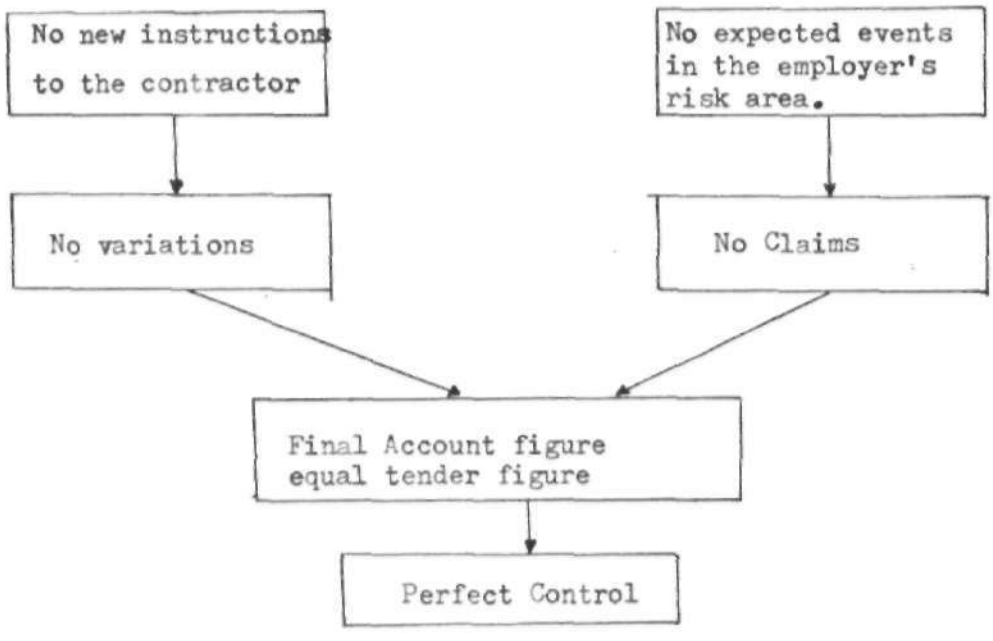


Fig.5: Control of Variations and Claims
(Source:- Barnes, 1988; Page: 74)

2.3.6 THE CONTRACTOR - FINANCE INSTITUTION RELATIONSHIP

One of the key problems sometimes encountered by the Construction firms is liquidity (Anekwe, 1987; Odeyemi, 1988). This is because working capital is the life blood of a firm as wages and salaries have to be regularly paid, materials and goods purchased and plants hired or put to use (Dogo, 1987).

According to Odeyemi (1988), this liquidity problem remains with most contractors because the Construction Industry is still regarded as a less preferred sector in banking allocation and borrowing classifications. Before a financial assistance is got, the character and ability of the contractor is analyzed in addition to the contractor's financial position.

The contractor often requires a vast amount of insurance coverage on the contract works. This is inevitable since risk stems from the fact that the future is beset with uncertainties both in terms of human behaviour and the characteristics of certain physical elements. In fact, it has been said that "risk, like death and taxes is always with us" (Cullen, 1980). Hence, Hertz and Thomas (1983) highlighted that risk refers to lack of predictability about structures, outcomes or consequences in a decision or planning situation. Since risk is related to the concept of chance such as the probability of loss or ruin, insurance becomes very necessary.

In order to emphasize the need for insurance of construction contracts, Lichtenberg (1981) classified the general uncertainties associated with contracts into three main categories:-

(i) Local uncertainties including cost parameters for materials, productivity data for labour and machines, soil conditions, construction methods etc.

(ii) Nature, including force majeure, weather, soil, accidents, certain failures and lack of supplies.

(iii) Human and social factors such as management and political forces, security measures, theft and wild damage, trends in wages and salaries, lack of timely decisions, motivation, last minute change orders, other social forces and in appropriate project management.

The foregoing author strongly contends that the last group of uncertainties (human and social factors), otherwise tagged 'real life uncertainties" is the most significant of the three as each of its individual factors is able to bias the final result by considerable amounts. The forms of contract (JCT and ICE) also identify these uncertainties (risks) and hence, the need for insurance.

It is thus apparent that the need for the contractor to keep very close relationship with the financial institution is inevitable.

2.4 PROJECT MANAGEMENT:-

According to Barnes (1988), the object of project management is to produce a complete project which complies with the client's objectives (See figure 6 below).

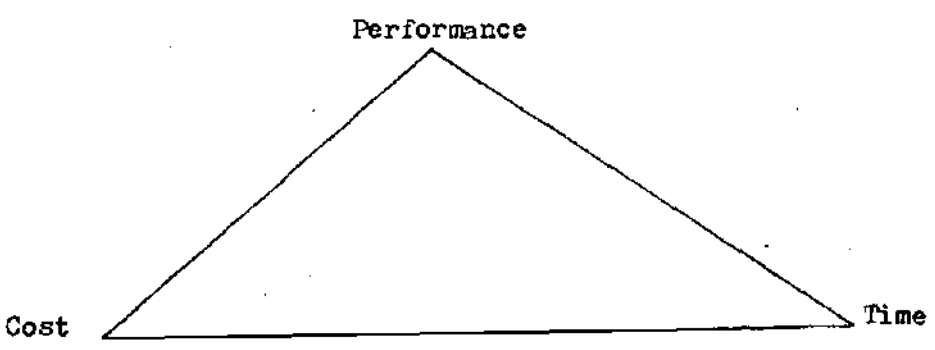


Fig. 6:- The Client's Objectives
(Source:- Barnes, 1988; Page:- 70)

In simple terms, the client's objectives are always a combination of the objectives for performance of the completed scheme, for achieving this performance within a named cost or budgetary limit and for getting the project into use by a target date. Good project management ensures that there is a widespread unity of view as to the client's objectives and that this view is maintained throughout the project.

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Martins (1976) described project management as a highly effective tool which is particularly useful in projects involving organisational complexity, when a number of separate divisions of an organisation are required to work together, or when a number of activities which include project simulation, project planning, resource allocation, project scheduling, project budgetting, project control and evaluation are involved.

The strategy of successful contracting depends more upon management judgement than upon anyother single factor. According to Park (1966) certain decision - making 'tools' can provide a valuable supplement to the executive's personal skill and experience although, they can hardly be expected to substitute for his informal judgement. Some of the decision - making/planning 'tools' used in the construction Industry for better judgement and hence achieve project goals are as follows:-

- Statistics and Probability Theory
- Operational Research

- Bar or Gantt Chart
- Line of Balance
- Network Analysis (Critical Path Method - CPM)

Other planning techniques applied but not covered in the scope of this work are matrix schedule and Progress Curves.

Every important management decision involves a process of selection between one or more alternative courses of action. Otherwise, no decision would be necessary. In making best possible decisions,

(i) The objectives must be defined

(ii) Different approaches that might be used to attain the desired objectives must be identified

(iii) Analyses and comparison of these alternatives to see which offers the best possibilities

(iv) Choosing the approach that is best suited to the firm's capabilities and objectives.

Today's Contractors have a variety of tools from which to choose to plan and control their projects. These tools vary widely in ease of use and analytical demands. According to Graf (1980), some factors which might affect the choice of a particular management tool are as follows:

- The size and complexity of the project
- The educational level of the manager(s)
- The past experience of the manager(s)
- The contractual requirements
- The time and cost to implement

Briefly, a review of these decision - making 'tools'/ Planning techniques follows:

2.4.1 STATISTICS AND PROBABILITY THEORY:

A contractor's success depends primarily upon the knowledge and judgement of its management. Also, a sound understanding of statistics and statistical techniques can provide the necessary knowledge for better managements' judgement.

Statistical techniques are valuable to the contractors in collecting, classifying and analyzing numerical data, and in using these data as a basis for predicting the outcome of future events. The usefulness of statistics as a tool for construction management will, depend to a large extent upon the availability of suitable data. The inferences to be drawn from statistical analysis can be no better than the raw data as a basis for the study (Park, 1966).

Probability theory also plays an increasingly important role in business decisions. Most management decisions require that the probable outcome of different events be predicted. Since predictions of future events can never be made with complete certainty, the most successful contractors (managers) are those who make predictions more often than their competitors.

2.4.2 OPERATIONS RESEARCH:

This is among the more exotic new aids to management decision - making. According to Park (1966), with the notable exception of critical Path Method (See Section 2.4.5), the Construction Industry has probably lagged behind most others in employing these valuable management tools. But with

or without such analytical aids, the modern construction executives must make more decisions in less time. Many decisions involve more than facts, they require subjective evaluations rather than objective measurements.

The ultimate aim of operational research is working within the framework of all that is known or than can be anticipated. It is a systematic and scientific approach to solving complex business and organisational problems. Operations Research generally involves the use of Mathematics in examining and evaluating possible alternative solutions to such diverse problems such as inventory control, resource allocation, waiting time analysis, construction scheduling, repair - replacement and competitive problems.

While many applications of operations research are quite complex, and therefore require a relatively high degree of mathematical sophistication, most problems can be solved through its intelligent application. As Park asserts, the operations research approach to management problem solving usually consists of five basic steps:-

(i) Definition of the problem in terms of the desired objectives

(ii) Accumulation of the necessary data

(iii) Evaluation of the effect of proposed plan on the company's operations

(iv) Testing of the proposed plan

(v) Putting the plans into effect

2.4.3 BAR OR GANTT CHART:

This method introduced as a production tool at the beginning of this century by Henry L. Gantt is the most commonly used planning techniques (Goodman and Love, 1980; Stillman, 1978). Goodman and Love (1980) have the view that bar chart can be used as a simple and easily understood model for communicating information to all levels of project management and supervision. According to Graf (1980), although a bar chart is simple, easily understood and used by field personnels, it has some shortcomings, since it provides no capabilities for resource management, optimization or project crashing, monitoring and control.

The technique consists of breaking down a construction project into arbitrary but logical activities or phases of work. Each of these activities are then plotted on a time-scaled bar and the relationship between the commencement and completion of each activity are readily observed. The length of the bar depicts the time required to complete the activity.

2.4.4 LINE OF BALANCE:

These schedules are a series of inclined bar lines, one for each trade or operation. According to Harris and McCaffer (1979), line of balance is a planning technique for repetitive work, it has been applied in the construction work mainly to house building, and to a lesser extent to jetty work and in conjunction with networks to roadworks. Butler (1979) emphatically concluded that "the method of planning, although long used in factory production line

situations, has only been adopted to any great extent in the building Industry since the early 1970's and has since proved very effective when applied to repetitive work, especially housing and flats with similar floors.

Line of balance main aim is to eliminate non-productive time, thus substantially reducing the period taken to build units.

2.4.5 NETWORK ANALYSIS:

The three techniques involved here are the CPM, the Program Evaluation and Review Technique (PERT) and the Activity box, among which the most commonly used is the CPM. According to McLaren and Buesnel (1969) CPM was developed by E. I. du Pont de Nermours and Co. of America in 1958. Naaman (1974) emphasized on this technique (CPM) when he adduced that "it is useful at various stages of a given project". Elerers (1971) also emphasized on its usefulness thus "since its inception, the technique has been an effective tool in the fundamental planning of the construction projects".

Anthill and Woodhead (1970) also described the CPM as a new and powerful tool, for the planning and management of all projects. He concluded that it is highly suited to the Construction Industry and provides, a far more useful and precise approach than the conventional bar charts and progress charts, that precisely formed the nucleus of construction planning and control.

The Critical Path Method involves the breakdown of the project into work activities as done in the Bar Chart. These activities are then arranged in a network fashion, which indicates the precedence and relationships with respect to time among these activities. The adjustment of non-critical activities, provides management with flexibility for purposes such as resource management (See Section 2.5) and decision affecting project economies. The other advantages are resource smoothing, total resources can easily be calculated and time/cost/resource techniques can be utilised. The most important functions of management, planning and controlling are effectively fulfilled by this technique.

Major sub-contractors and specialists can contribute to the planning function by examining their relevant section of the network, assessing its soundness and thus avoiding the possibility of unrealistic and superficial planning. This technique also facilitates the use of a computer to deal with calculations. Like any other technique it has its own disadvantages (Cooke, 1981). See table 2.1 for comparative factors of some planning techniques.

Table 2.1:- Modified Comparative factors of some Construction planning techniques

No.	FACTOR	BAR CHART	LINE OF BALANCE	CRITICAL PATH METHOD (NETWORK) ANALYSIS)	PROGRESS CURVE	MATRIX SCHEDULE
1	For planning	Very Good	*Good	*Very Good	Fair	Fair
2	Cost schedule Alternative	*Poor	*Fair	*Very Good	Poor	Poor
3	Provision for uncertainty in estimates	*None	*None	*None	None	None
4	Flexibility	*Good	*Fair	*Very Good	Fair	Fair
5	Usefulness for allocation of resources	*Fair	*Good	*Very Good	Fair	Fair
6	Usefulness for large and complex projects	Fair	Poor	Very Good	Poor	Poor
7	For projects that are repetitive in nature	Fair	Very Good	Fair	Poor	Fair
8	Ability to show cummulative progress of work	Fair	Poor	Poor	Very Good	Poor

*Source:- Finch (1976)

2.5 RESOURCE MANAGEMENT:

According to Clough and Sears (1972), the completion of a construction project at maximum efficiency of time and cost requires the judicious scheduling and allocation of available resources. The resources include materials, manpower, finance and plant/equipment.

The basic objectives of resource management is to supply and support the field operations so that established time objectives can be met and costs can also be kept within the budget. The scheduling and allocation of these resources are interrelated and the action affecting one often affects the others in same manner.

2.5.1 MATERIALS MANAGEMENT:

Management control over materials is concerned with ensuring that the materials, in the quantities and qualities required are on the sites as needed. Hence, Bell and Stukhart (1986) highlighted that materials management is generally recognised as the integrated co-ordination of materials take-off, purchasing, expediting, receiving, warehousing and distribution.

Materials management has been defined as the management system for planning, controlling all necessary efforts to make certain that the right quality and quantity of materials as appropriately specified in a timely manner, are obtained at a reasonable cost and are available when needed.

Materials management can be carried out efficiently only when sufficient emphasis is placed on early project planning, personnel training and communication. Basically, management control of materials is directed primarily towards achieving timely delivery. This is achieved by a good co-ordination with the materials vendor. The establishment of the order lead time is also an important aspect of material control.

Inadequate materials management could thus constitute a problem to the contractor hence, Otobo (1985) asserts that lack of essential construction materials/ irregularity and uncertainty of supply constitutes one of the major problems facing the indigenous Contractors.

2.5.2 MANPOWER MANAGEMENT:

Manpower is of utmost importance in order to achieve the ultimate goal of the Contractor's organisation (See Teicholz, 1974). For a successful manpower management, there has to be detailed compilation of daily labour requirements, needed to maintain the established project schedule and manpower levelling which according to Clough and Sears (1972), is the process of selective re-scheduling of non-critical activities.

Improper manpower management could thus constitute a problem to the contractors hence, Ayyub and Halder (1985) attribute manpower skill and experience as one of the factors affecting Construction operations. Stillman (1978)

also emphasized on manpower management when he highlighted, that organisational (manpower) supervision must be accomplished by men who are fully knowledgeable about all the facets of construction in order to ensure smooth project execution. Barwell (1985) also had the view that, one of the most difficult problems facing a contractor on the award of a contract is in making available a number of company men sufficient to mobilise the job expeditiously.

2.5.3 FINANCE (MONEY) MANAGEMENT:

Finance should be adequately managed and thoroughly apportioned in order to achieve the ultimate aim of the contract. According to Adeyemo (1974), the management of financial resources should be carried out by the use of techniques like the return on capital employed, working capital analysis, the use of financial ratios for the control of operations as well as for the analysis of financial resources. Good financial record-keeping and some measure of good accounting, and also attitude of the contractors to financial matters generally is very necessary.

The need for thorough management of finance by the contractors is of paramount importance since, a lot of problems are usually attributable to mis-management of finance. This was confirmed by Barwell (1985), when he argued that, money is the most important resource. For without it, the others cannot be obtained.

2.5.4. PLANT/EQUIPMENT MANAGEMENT:

According to Clough and Sears (1972), the following are important for the proper selection, use and maintenance

of equipment on the job sites. They are:

(i) Equipment sent to the job should be of the type that will best perform the work under actual job conditions.

(ii) Work should be planned and scheduled to achieve the fullest use of every equipment item

(iii) Field maintenance should be a part of the prejob planning.

(iv) In order to facilitate getting the machines back as quickly as possible, repair services may be provided by the contractor's central equipment shop or by a nearby equipment dealer.

(v) Prevention of the temptation of overloading the equipment in an effort to get more production.

(vi) Actual production rates and costs should be checked on the site for each major piece of equipment.

With an effective management, the equipment can be better utilised. The use of equipment schedule ensures that they are brought as when needed since, a pre-knowledge would be had. It also ensures, that maximum production is achieved and cost minimized and hence the ultimate target achieved.

Lack of proper management of Plants/Equipment could, constitute a major problem to the contractor. Otobo (1985) confirmed this, when he opined that the non-availability of plants/equipment constitutes one of the major problems of the indigenous contractors during project execution.

CHAPTER THREE

RESEARCH PROCEDURE

After a thorough review of the literature as regards what should obtain in the Construction Industry for smooth project execution, the purpose of this chapter is to find out what actually obtains in practice in the Nigerian Construction Industry, and thus, deduce the problems and prospects of the indigenous contractors.

3.1 DATA COLLECTION :

For the purpose of data collection the indigenous construction firm was subdivided into the following categories, (Armstrong, 1980; Owor, 1988):

(i) Large Construction firm

(ii) Medium Construction firm

(iii) Small Construction firm

The subdivision was based on Odepidan's (1974) work. See Section 2.1.1. This include most especially the annual turnover. Factors such as number of employees, equipment owned, could not be used because of the varying nature of the Construction Industry. The information needed for this research was collected with the aid of self administered questionnaires, oral interviews/discussions and site visits in order to achieve more realistic data.

3.2 STRUCTURE OF THE QUESTIONNAIRE:

In order to ascertain and identify the major problems of the indigenous construction firms as well as their prospects, the questionnaire method was adopted. The questionnaire was designed in a very simple format devoid

of ambiguity, taking cognisance of the varied educational background of the prospective respondents and yet, covering a fairly wide scope of relevant issues (See Appendix E).

The format basically involved answers that just needed to be ticked and any other relevant information. This was done in order to facilitate the ease of response by busy executives of the Construction Industry.

The questionnaire was pretested and responses of those who participated led to an improvement in its standard in terms of clarity and meaningful responses.

The questionnaire can be subdivided into the following sections:

(i) Information about the Respondent (Nos. 1-6)

(ii) Information about the Company (Nos. 7-15)

(iii) Information about the actual or current practices in the Construction Industry and prospects (Nos.16-29)

A space was allowed for any additional comments by the respondents in relation to the subject matter.

A covering letter was attached to each questionnaire explaining the objectives of the research, and also assuring the respondents of the confidentiality of the information provided and the urgency with which the information was required (See Appendix D).

3.3 DISTRIBUTION AND RESPONSE:

The questionnaires were administered mostly to the Senior executives of the Construction Industry, both at the head offices and also on site (where applicable). This is because they are the central figures in the firm and hence, would be able to give meaningful responses to the questions asked since they are the main co-ordinators of theprojects.

In the survey, the following states were covered - Rivers, Imo, Akwa-Ibom, Cross Rivers and Anambra. So it could be reasonably assumed that geographically speaking, the survey covered the eastern part of Nigeria.

All the questionnaires were administered personally, this made the responses faster than anticipated and also created better contact and familiarity with the executives in ease of any future call back or research. The questionnaires collection were followed up with oral interviews/discussions.

Within the two and half ($2\frac{1}{2}$) months period of intensive effort and extensive travelling, a total of fifty-two completed copies of questionnaires were collected out of the 72 distributed and this is quite appreciable because a majority of the respondent companies are currently handling different projects (See Tables 3.9; 3.10; 3.11).

From observations, the few questionnaires that were not responded to can be presumed to be as a result of the following reasons: Lack of time; No interest; Present condition of the Company (no job at hand); lack of trust (oath of secrecy).

It should however be noted that the firms covered were with the help of consultancy firms in each of the states visited who readily gave the lists of the indigenous construction firms in that area. That not withstanding, random sampling was still carried out since all the firms could not be reached and also all the executives in a particular firm could not be interviewed.

3.4 OTHER SOURCES OF INFORMATION:

The Federal and State ministries of works and housing were contacted, for the registration requirements and classification of the indigenous contractors and also, other relevant information with regards to management of the projects (especially payments to contractors). This was done bearing in mind that the Federal and State governments are the largest clients: Diejomaoh (1974).

Since the respondents showed a lot of interest and speedy response to the questionnaires, and also actively participated in the oral interviews/discussions, it can therefore be reasonably assumed that the responses are objective, well-intentioned, reliable and hence would constitute a sound basis for the subsequent analysis.

3.5 PRESENTATION AND ANALYSIS OF RESPONSES

For ease of comparison and deductions, the data (responses) presentation is expressed in percentages except where otherwise specified.

Of the states covered, 39% of responses were from Rivers, 19% from Imo, 15% from Akwa Ibom, 15% from Cross-Rivers and 12% from Anambra state.

These responses are presented in a tabular form in the table 3.1.

Table 3.1. Survey Area Covered

SURVEY AREA (STATES)	NO. OF FIRMS SURVEYED	PERCENTAGE (%)
Rivers	20	39
Imo	10	19
Akwa Ibom	8	15
Cross Rivers	8	15
Anambra	6	12
TOTAL	52	100

The data collected (survey) is analysed by collating and interpreting the data on the respondents' background, companies covered, contractors problems assessment criteria and prospects.

3.5.1 THE RESPONDENTS' BACKGROUND

Respondents' age/maturity:

Table 3.2. below shows a breakdown of the respondents according to their ages.

Table 3.2: Respondents' Age

AGE RANGES (YEARS)	NO. OF RESPONDENTS	PERCENTAGE (%)
24 - 30	20	38
31 - 36	22	42
37 - 40	2	4
41 - 50	6	12
Over 50	2	4
TOTAL	52	100

A total of 80% of the respondents indicated ages in the range of 24 to 36 years, 16% indicated ages in the range of 37 to 50 while only 4% of the respondents are over 50 years.

This implies that the respondents have attained maturity and thus makes the responses more objective.

Respondents and Qualifications:

Table 3.3. shows a breakdown of the respondents according to their qualifications.

Table 3.3. Respondents' Qualifications

QUALIFICATION	NO. OF RESPONDENTS	PERCENTAGE (%)
First School Leaving Certificate	-	-
WASC/GCE/Grade II	1	2
HND/B.SC.	48	92
Postgraduate Diploma/Degrees	2	4
Others	1	2
TOTAL	52	100

The Higher National Diploma/Degree were the highest qualifications attained by 92% of the respondents. 4% of the respondents attained Postgraduate qualifications, while 2% of the respondents possessed both degrees/diploma and professional qualifications. The other 2% are without qualifications.

As regards the field of specialisation, 44% of the respondents studied Civil Engineering, 38% Quantity Surveying while 16% studied building/building technology (See table 3.4).

Table 3.4: Respondents Specialisation Areas.

SPECIALISATION AREA	NO. OF RESPONDENTS	PERCENTAGE (%)
Civil Engineering	23	44
Quantity Surveying	20	38
Building/Building Technology	8	16
Others (un-educated)	1	2
TOTAL	52	100

Respondents' Experience:

Table 3.5 shows a breakdown of the respondents' tenures in the companies.

Table 3.5: Respondents' Tenures in Companies

TENURE (YEARS)	NO. OF RESPONDENTS	PERCENTAGE (%)
Under 3	10	19
3 - 6	18	35
7 - 9	9	17
Over 9	15	29
TOTAL	52	100

Of their tenure as company staff, the largest percentage (35%) indicated 3 to 6 years, 29% indicated over 9 years, 19% indicated under 3 years while 17% indicated 7 to 9 years experience in the company. Generally speaking therefore, it could be reasonably assumed that at least 46% of the respondents have been staff of their companies for 6 years.

Respondents' Status:

Project/Contract/Construction Managers represent 59% of the total number of respondents, Engineers represent 19%, 12%is represented by Chief Estimators/Quantity Surveyors and Directors respectively. In addition, Directors/Project Managers is represented by 10% of the total number of respondents.

From the foregoing, it is obvious that majority of the respondents have attained maturity age, reasonably well-educated, fairly well experienced and also functioning in significant managerial capacities. This result is auspicious of the Nigerian Construction Industry and thus enhances the applicability of theoutcomes of this study as further discussed in the subsequent chapters.

3.5.2 COMPANIES COVERED:

As stated in Section 3.1, the companies surveyed were classified as shown in table 3.6.

Table 3.6: Classification of Companies

CLASSIFICATION OF COMPANIES	NO. OF COMPANIES	PERCENTAGE (%)
Large	11	21
Medium	24	46
Small	17	33
TOTAL	52	100

The total number of respondent companies is a collation from all the states surveyed (See table 3.7)

Table 3.7: Classification of Companies Covered in each Survey Area.

CLASSIFICATION	NUMBER OF COMPANIES UNDER EACH CLASSIFICATION IN EACH SURVEY AREA (STATE)					TOTAL NO. OF COMP-ANIES	PERCENTAGE (%)
	RIVERS	IMO	AKWA IBOM	CROSS RIVERS	ANAMBRA		
Large	4	2	2	2	1	11	21
Medium	10	4	4	3	3	24	46
Small	6	4	2	3	2	17	33
TOTAL	20	10	8	8	6	52	100

A total of 21% of responses were received from large construction firms, 46% from medium-sized construction firms while 33% of the responses were from small construction firms. This implies that generally speaking, the different classifications of the firms were almost evenly surveyed.

3.5.2.1 COMPANY HISTORY AND OPERATIONS:

Of the firms surveyed under the different classifications, all were registered with both the Federal and States Works Registration boards. This showed that all the firms surveyed were recognised as construction firms.

On the period of existence, only 7% of the companies indicated less than 10 years of operation. It could thus be reasonably assumed that majority (93%) of the response is from well established firms.

As regards field of speciality, 92% of the firms surveyed under the different classifications specialise in building and civil Engineering construction, 4% specialise in building construction only, a further 4% specialise in Civil Engineering Construction only (See table 3.8).

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Table 3.8: Construction firms Specialities

CONSTRUCTION SPECIALITIES	NO. OF COMPANIES	PERCENTAGE (%)
Building Only	2	4
Civil Only	2	4
Building and Civil	48	92
TOTAL	52	100

In the space provided for any other speciality, a total of 6% indicated water projects. This shows that building and Civil Engineering Construction firms form the bulk of the main contracting organisations covered by the survey, and by extension of the Construction Industry at large.

As regards the operations of the companies surveyed, see tables 3.9 - 3.11.

Table 3.9: Operational Record of Large Construction firms.

MAXIMUM NUMBER OF PROJECTS / SITUATIONS	0	1	2	3	4	5	6	7	8	9	10	Over 10
	NUMBER OF COMPANIES (in %)											
Projects handled in the past 5 years	-	-	-	-	-	-	-	18	-	9	-	73
Projects Completed on Schedule	46	-	-	-	27	-	9	-	9	-	-	9
Projects currently handled at different sites	-	-	-	-	-	-	-	-	-	-	-	100

Table 3.10: Operational Record of Medium-Sized Construction firms.

MAXIMUM NUMBER OF PROJECTS / SITUATIONS	0	1	2	3	4	5	6	7	8	9	10	Over 10
	NUMBER OF COMPANIES (in %)											
Projects handled in the past 5 years	-	-	-	-	-	8	8	13	21	16	21	13
Projects completed on Schedule	54	-	-	4	-	-	8	4	8	18	-	4
Projects currently handled at different sites	-	8	4	25	-	-	46	-	-	-	-	17

Table 3.11: Operational Record of Small Construction firms

MAXIMUM NUMBER OF PROJECTS / SITUATIONS	0	1	2	3	4	5	6	7	8	9	10	Over 10
	NUMBER OF COMPANIES (in %)											
Projects handled in the past 5 years	-	-	-	6	41	-	-	6	29	-	12	6
Projects completed on Schedule	76	-	-	12	-	-	-	-	6	-	-	6
Projects currently handled at different sites	12	16	12	18	-	-	24	-	-	12	-	6

From the foregoing three tables, the survey revealed that 73% of the large firms had so far in their history handled over 10 projects in the past 5 years. As regards the number of projects completed on schedule, 9% of the firms indicated having

completed over 10. Similarly, over 10 projects are currently under construction by each of the large firms surveyed.

For the medium-sized construction firms, at least 92% of the firms have handled over 5 projects in the past 5 years. 54% of the firms indicated not having completed any project on schedule while all the firms were engaged on site.

The small construction firms have all handled projects in the past 5 years of their existence. As regards projects completed on schedule, only 6% indicated having completed over 10 projects. 12% of the firms indicated no contractual engagement.

It could be generally inferred that the firms are in an averagely healthy condition although, this cannot be over emphasized since most of the projects handled were not completed on schedule and also considering the fact, that lack of engagement was one of the presumed reasons for non-participation of some firms during the survey.

3.5.3 CONTRACTORS PROBLEMS ASSESSMENT CRITERIA

Manpower availability is said to have much influence on the contractor's success in the contract as earlier mentioned (See Section 2.5.2.). As regards the number of

professionals on the payroll in the large construction firms surveyed, 82% indicated having all the professionals while 18% indicated not having both Architects and Builders. In the medium-sized construction firms, 59% indicated having all the professionals on thepayroll while 33% indicated not having Architects and Builders. 8% indicated not having only Architects on their payrolls.

In the Small Construction firms, 12% indicated having all the professionals on their payroll, while the survey revealed that 77% do not have Engineers and Builders. Similarly, 11% indicated not having Builders, Architects and Engineers only on their payroll. A majority of the directors claimed that they do not perceive any benefits from any professional, since they can effectively execute their functions.

The following reasons were given for the shortage or absence of the professionals:

(i) State of the economy (89%)

(ii) No perceived benefits (26%)

(iii) Scarcity of qualified manpower (8%)

(Note that some respondents proffered more than one group of reasons).

The responses on contracts most often signed by the contractors is tabulated in tables 3.12 - 3.14.

Table 3.12: Contracts Often Signed in Large Construction Firms.

TYPES OF CONTRACTS	NO. OF COMPANIES	PERCENTAGE (%)
Lump Sum Contracts based on Bill of Quantities (BOQ), drawings and specification only	9	82
Cost reimbursable contract	-	-
Target Cost contract	-	-
Package Deal or TurnKey contract	1	9
Lump Sum and Package Deal Contract	1	9
TOTAL	11	100

Majority (82%) of the firms sign lump sum contracts most often. 9% respectively sign package deal or turnkey and lump sum/Package deal more often.

Table 3.13: Contracts often signed in the Medium-sized construction firms.

TYPES OF CONTRACTS	NO. OF COMPANIES	PERCENTAGE (%)
Lump Sum Contracts based on Bill of Quantities (BOQ), drawings and Specification only	19	79.2
Cost reimbursable Contract	1	4.2
Target Cost Contract	-	-
Package Deal or Turnkey Contract	2	8.3
Lump Sum and Package Deal Contract	2	8.3
TOTAL	24	100

Similarly, in the medium-sized construction firms, 79.2% of the firms surveyed indicated lump sum contracts as that most often signed while 4.2% indicated having signed Cost reimbursable contracts most often. 8.3% respectively have signed Package Deal and Lump Sum Contract most often.

Table 3.14: Contracts often signed in the small construction firms.

TYPES OF CONTRACTS	NO. OF COMPANIES	PERCENTAGE (%)
Lump Sum Contracts based on Bill of Quantities (BOQ), drawings and Specification only	11	65
Cost reimbursable contract	1	6
Target Cost Contract	4	23
Package Deal or Turnkey Contract	-	-
Lump Sum and Package Deal Contract	1	6
TOTAL	17	100

In the small Construction firms surveyed, 65% indicated signing the lump sum contract most often. 6% sign Cost reimbursable contract, 23% sign Target Cost contract most often. No percentage indicated signing Package Deal or Turnkey contract often. 6% indicated signing Lump sum contract and package Deal most often.

It could be deduced that on the type of contracts most often signed by the different classifications of the construction firms surveyed, an overwhelming majority, 75%, of the respondents indicated the lump sum contracts based on BOQ, drawings and specifications only. This thus upholds the view that it is the most popular and commonly used contract in the area studied.

Different reasons were given for the preference of the lump sum contract based on BOQ, drawings and specification only to other contracts and they are summarized as follows:

(i) It is the easiest type of contract to manage in case of variations either in prices of items or quantities.

(ii) Although the risk is on the contractor, once the estimator is competent, then it is very ideal as post contract management is very easy to monitor.

(iii) It spells out in detail the obligations of the parties.

(iv) Quantities of the bulk of work can be ascertained with reasonable accuracy before work starts. In addition, contract conditions, drawings and specifications are available to be followed.

In the space tagged 'others' (please specify) the Measurement and Contractor finance Contract were indicated.

Different tendering methods are used in the construction firms. For the tendering methods preferred in the different classifications of the Construction Industry, See tables 3.15 - 3.17.

Table 3.15: Tendering Methods preferred in the Large construction firms.

TENDERING METHODS	NO. OF COMPANIES	PERCENTAGE (%)
Competitive	-	-
Negotiated	5	45
Selective	6	55
TOTAL	11	100

55% of the respondents prefer the selective tendering while 45% prefer negotiated tendering method. None of the companies surveyed showed any interest in competitive tendering method. The reason given for this was that there are lesser chances of winning the jobs. Perhaps, this indicates the generally low-level of competence of contractors.

Table 3.16: Tendering Methods Preferred in the Medium-Sized Construction firms.

TENDERING METHODS	NO. OF COMPANIES	PERCENTAGE (%)
Competitive	7	29
Negotiated	8	33
Selective	9	38
TOTAL	24	100

38% of the companies surveyed prefer selective tendering method while 33% prefer negotiated and 29% competitive tendering.

Table 3.17: Tendering Method Preferred in the Small Construction firms.

TENDERING METHODS	NO. OF COMPANIES	PERCENTAGE (%)
Competitive	5	29
Negotiated	4	24
Selective	8	47
TOTAL	17	100

47% of the companies surveyed prefer selective tendering while 29% prefer competitive and 24% negotiated tendering.

The highlight from the different classifications of the Construction Industry surveyed is that the selective tendering method is generally preferred.

The reasons given for the preference of selective tendering method over the others are as follows:

(i) There are more chances of getting jobs

(ii) It offers class distinction and competition among class and thus does not give room for incompetent contractors

(iii) It makes room for the preparation of more realistic bids.

As regards the Contractor's Operational environment relationship in the Construction firms, tables 3.18 - 3.20 and the follow up oral interviews/discussions show the current

practices. As earlier mentioned, nothing can be done in isolation in the Construction Industry (See Section 2.3.5), hence, the relationship between the contractor and the other parties to the contract has great influence on the project.

Table 3.18: Contractor Operational Environment Relationship in the Large Construction firms.

CONTRACTOR'S OPERATIONAL ENVIRONMENT	NO. OF COMPANIES (in %)		
	VERY CORDIAL	CORDIAL	NOT CORDIAL
Contractor - Design Consultants Relationship	4	82	14
Contractor - Sub contractors Relationship	-	55	45
Contractor - Materials Vendor Relationship	-	100	-
Contractor - Equipment Vendor Relationship	18	82	-
Contractor - Client Relationship	-	73	27
Contractor - Finance Institution Relationship	-	100	-

Majority of the respondents indicated cordial relationship with other parties to the contract (The follow-up interview results give futher details).

Table 3.19: Contractor Operational Environment Relationship in the Medium-Sized Construction firms.

CONTRACTOR'S OPERATIONAL ENVIRONMENT	NO. OF COMPANIES (in %)		
	VERY CORDIAL	CORDIAL	NOT CORDIAL
Contractor-Design Consultants Relationship	4	92	4
Contractor-Sub-contractors Relationship	-	29	71
Contractor-Materials Vendor Relationship	-	54	46
Contractor-Equipment Vendor Relationship	-	92	8
Contractor-Client Relationship	-	83	17
Contractor-Finance Institution Relationship	-	75	25

Similarly, majority of the respondents indicated the the existence of cordial relationship with other parties to the contract (the oral interview results give further details).

Table 3.20: Contractor Operational Environment Relationship in the Small Construction firms.

CONTRACTOR'S OPERATIONAL ENVIRONMENT	NO. OF COMPANIES (in %)		
	VERY CORDIAL	CORDIAL	NOT CORDIAL
Contractor-Design Consultants Relationship	29	71	-
Contractor-Sub-contractor Relationship	-	88	12
Contractor-Materials Vendor Relationship	-	12	-
Contractor-Equipment Vendor Relationship	-	71	29
Contractor-Client Relationship	-	59	41
Contractor-Finance Institution Relationship	-	18	82

Also the existence of cordial relationship was indicated by a majority of the respondents. As regards materials vendor relationship, only 12% of the respondents claimed having cordial relationship. 88% (un-indicated in the table) make direct purchase hence, no relationship with the materials vendor (See follow-up results).

From the oral discussions, the following results were obtained:

Contractor - Design Consultants Relationship:- The consultants include both the Architects and the Mechanical/Electrical Consultants. Problems are created for the contractor in terms of incorrect designs, incomplete drawings and also in most cases, the design consultants are incompetent and careless about site details and this subsequently creates un-necessary delays for the contractor. In terms of preparation of certificates for payments, the contractors generally highlighted the Architects attitude towards that as very poor.

Contractor - Subcontractors Relationship:- Contractors claimed (especially the large and medium-sized firms) that subcontractors do not co-operate (especially the nominated subcontractors) with them on site and this sometimes delays project completion. This could perhaps be due to stuborness, non-dedication to duty and most essentially finance problem.

Contractor - Material Vendor Relationship:- Only very few contractors in the large and medium-sized construction firms claimed having encountered some problems. Majority have

resolved to making materials purchases directly just like in the small-sized Construction firms.

Contractor - Equipment Vendor Relationship:- Most of the contractors claimed not having encountered problems with equipment vendors. Although, they would have preferred to own their equipment personally (especially the medium and small-sized construction firms).

Contractor - Client Relationship:- The relationship between the contractor and client is crucial for the success of any project. Clients create one of the contractor's major problems which is also one of the factors contributing to the present state of the Construction Industry. The problem is that of non-payments for jobs already executed at the specified time in the conditions of contract. This was further confirmed when all the companies indicated that they have at one time or the other suffered from non-payments for jobs already executed. The effects of this on the companies are cash flow problems, retrenchment of skilful workers, project delays and subsequently project abandonment.

Majority of contractors specifically mentioned Government projects as being the worst affected in terms of non-payments. To find out the purpose of this, some top officials in the Government ministries were contacted and the reason for this was given as lack of good feasibility and priority factor.

Contractor - Finance Institution Relationship:- The assistance received from finance institution by contractors was said to be very inadequate. This in most cases, does not allow the contractors meet up commitments.

From the foregoing, it could be inferred that the issue of good relationship between the contractor and the other parties to the contract is not highly practised in the Nigerian Construction Industry. Hence, any cordial relationship between a contractor and any other party to the contract occurs by chance and not with the intention that better results could be achieved.

Planning/Decision Stages Activities:

The effectiveness and accuracy of a contractor at the Pre-tender stage determines his participation in a particular contract, and the ultimate achievement of the client's objectives.

On the factors considered during bidding, all the respondent firms considered financial requirement of the project and resources availability. A significant proportion (over 50%) considered size of project, location of project, site conditions, Name of client and consultants, current and immediate future workload, level of competition, Possible Weather effect and type of contract. On the average

only a noticable minority (over 10%) considered political effect on the project while none of the companies considered costs of preparing the bid and technology (method of construction).

The salient deduction from the foregoing and oral discussions held is that these factors do not constitute any major problems to the contractors.

As regards Pre-Contract planning, it could be deduced that generally, adequate/proper planning is not carried out before work commences on site. Majority (over 70%) of the medium and small-sized construction firms interviewed, adduced that in most cases, it is considered a waste of time since planning can be carried out as work progresses on site. It was also observed that in some construction firms, plans put on paper are not carried out because of the managements' orders which considers that as waste of time.

This issue of planning could be further elaborated with enquiry made on the employment of management techniques (planning and decision making) in the construction firms.

Table 3.21: Management Planning Techniques Application in the Large Construction firms.

TECHNIQUES APPLIED	NO. OF COMPANIES ADOPTING TECHNIQUE	PERCENTAGE (%)
Bar (Gantt) Chart only	6	55
Critical Path Method only	-	-
Bar Chart/Critical Path Method	4	36
Line of Balance	-	-
Computer Approach	1	9
TOTAL	11	100

55% of the firms surveyed use bar chart planning technique only, 36% apply both bar chart and critical path Method while only 9% of the firms surveyed apply the computer approach.

The highlight is that in the large Construction firms surveyed, a larger proportion still adopt only the bar chart planning technique and the reason given for this is its simplicity and ease to understand. The respondent that indicated the use of Computer approach highlighted its immense importance to the firm.

Table 3.22: Management Planning Techniques Application in the Medium-Sized Construction firms.

TECHNIQUES APPLIED	NO. OF COMPANIES ADOPTING TECHNIQUE	PERCENTAGE (%)
Bar (Gantt) Chart only	18	75
Critical Path Method only	1	4
Bar Chart/Critical Path Method	4	17
Line of Balance	1	4
Computer Approach	-	-
TOTAL	24	100

75% of the medium-sized firms surveyed apply only bar chart technique as its planning technique, 4% apply only the Critical Path Method (CPM), 17% apply both the bar chart and CPM while only 4% apply the line of balance. None of the companies apply the computer approach.

The inference here is that a very large proportion of the medium-sized firms adopt basically the bar chart planning technique while the Computer approach is not yet being used. Same reason as above was given for its preference.

Table 3.23: Management Planning Techniques Application in the Small Construction firms.

TECHNIQUES APPLIED	NO. OF COMPANIES ADOPTING TECHNIQUE	PERCENTAGE (%)
Bar (Gantt) Chart Only	10	59
Critical Path Method Only	-	-
Bar Chart/Critical Path Method	3	18
Line of Balance	-	-
Computer Approach	-	-
None	4	23
TOTAL	17	100

59% of the firms surveyed apply bar chart only while 18% apply both bar chart and critical Path Method. None of the companies indicated adopting either the CPM only, line of balance or computer approach. 23% of the companies indicated not applying any planning technique at all.

The enquiry on the employment of planning techniques elicited an averagely positive response. At the follow-up interview, over half of the respondents admitted that these techniques are not actually carried out on site. Some indicated that the manual approach which involves intuition, past experience and rough paper work is used. It is therefore glaringly evident that planning techniques are not thoroughly implemented in the construction firms.

With regards to decision making 'tools' application by the indigenous contractors, See tables 3.24 to 3.26.

Table 3.24: Management Decision Making 'tools' Application in the Large Construction firms.

'TOOLS APPLIED	NO. OF COMPANIES ADOPTING 'TOOL'	PERCENTAGE (%)
Statistics and Probability Theory Only	1	9
Operations Research Only	8	73
Statistics and Probability Theory/Operations Research	2	18
None	-	-
TOTAL	11	100

9% of the firms indicated the application of Statistics and Probability theory, 73% of the firms surveyed indicated the application of Operations Research only while 18% apply both Statistics/Probability theory and Operations Research.

Table 3.25: Management Decision Making 'tools' Application in the Medium-Sized Construction firms.

'TOOLS' APPLIED	NO. OF COMPANIES ADOPTING 'TOOLS'	PERCENTAGE (%)
Statistics and Probability Theory Only	13	54
Operations Research Only	1	4
Statistics and Probability Theory/Operations Research	3	13
None	7	29
TOTAL	24	100

54% of the companies applied statistics and Probability theory only, while 4% indicated the use of Operations Research only, 13% claimed the use of both tools while 29% indicated not applying any of these tools at all in its management decision making.

Table 3.26: Management Decision Making 'tools' Application in the Small Construction firms.

'TOOLS APPLIED	NO. OF COMPANIES ADOPTING 'TOOL'	PERCENTAGE (%)
Statistics and Probability theory only	1	6
Operations Research Only	-	-
Statistics and Probability Theory/Operations Research	-	-
None	16	94
TOTAL	17	100

Application of statistics and Probability theory is by only 6% of the company. None of the companies applied Operations Research or Statistics and Probability theory/ Operations Research. An overwhelming percentage of 94% indicated the application of none of these 'tools' in their management operations.

At a follow-up interview, majority claimed that these decision making 'tools' are not thoroughly implemented in the firms. This is because, most decisions are based on past experience and intuition. But a few of the respondents claimed that it has been of much importance to their organisations. It is therefore glaring that majority of construction firms have not realised the importance of the application of decision making 'tools' in its management operations.

Of the various reasons suggested for the non-implementation of management techniques in the construction firms, 50% indicated non-familiarity with the techniques, 38% identified no perceived benefits while 36% claimed lack of time. 48% indicated lack of qualified technical expertise. Another indication was lack of understanding and interpretation of these techniques (planning techniques) by the site operatives (24%). It should be noted that some respondents indicated more than one reason.

The deduction from the above is that the application of management techniques needs technical expertise.

Ranking of Contractors Problems:

It has been discovered that the contractors problems are numerous. Seven major problems identified were ranked by the respondents according to how it affects their companies. The feedback tables are shown in Tables 3.27 to 3.29 in which adjustments have been made for tied ranks (observations).

To test the degree of agreement of the firms in ranking these problems and also to determine whether the ranks total (Rj) differ significantly thereby, ranking these problems in order of importance in the different classifications of the construction firm, the Friedman Two-way Analysis of Variance by Ranks, χ_r^2 based on the following formula was used (See Siegel, 1956):

$$\chi_r^2 = \frac{12}{Nk(k+1)} \sum_{j=1}^{k} (R_j)^2 - 3N(k+1)$$

Computation:

To compute the value of the statistic which Friedman denotes as χ_r^2 we first find the sum of ranks, Rj, in each row of a K x N table after adjustments have been made for tied ranks (observations). Then we find $(Rj)^2$ in each column. Finally the sum of $(Rj)^2$ - $\sum_{j=1}^{k}(Rj)^2$ is found. Knowing these values, we may compute the value of χ_r^2 using the formula above.

Where:

N = number of columns

K = number of rows

Rj = Sum of ranks in Jth row

$\sum_{j=1}^{k}$ directs one to sum the squares of the sum of ranks over all K conditions.

Tied Observations:

When tied observations occur, the observations are each assigned the average of the ranks they would have been assigned had no ties occured, the usual procedure in ranking tied scores. For the test in question, Friedman stated that "the substitution of the average rank for tied values does not affect the validity of the χ_r^2 ".

Test of Significance:

The small and large sample criteria is applied here. Also, the hypotheses and the decision rule are defined when testing significance. These are as follows:

Null Hypothesis (Ho): All the firms are not in agreement as regards the ranking of the problems of the indigenous Contractors in the Construction Industry.

Alternative Hypothesis(H_1): All the firms are in agreement as regards the ranking of the problems of the indigenous contractors in the Construction Industry.

Decision Rule : If χ_r^2 is greater than $\chi_{.05}^2$ reject null hypothesis and conclude that there are no significant differences between the ranking of the indigenous contractors problems.

Table 3.27: Ranks Assigned to 7 Problems of the Indigenous Contractors by Large Construction firms.

PROBLEMS	NO. OF COMPANIES											Rj	$(Rj)^2$
	1	2	3	4	5	6	7	8	9	10	11		
Non-availability of funds	2	1	1	1	2	3.5	2	1	5.5	1	2	22	484
Non-availability of materials	3.5	3	2	2	5	5.5	3.5	2.5	3	2	3.5	35.5	1260.25
Non-availability of plants/ Equipment	1	4.5	5	4	3.5	5.5	3.5	6	3	4.5	3.5	44	1936
Shortage of Manpower	7	7	7	7	6	7	1	7	7	7	7	70	4900
Effect of Government Policies/ Change of Government	6	6	6	6	7	1	6	2.5	5.5	4.5	6	56.5	3192.25
Lack of co-operation amongst parties to a contract	5	2	3.5	4	3.5	2	6	4	3	4.5	5	42.5	1806.25
Lack of qualified technical expertise	3.5	4.5	3.5	4	1	3.5	6	5	1	4.5	1	37.5	1406.25

$\sum_{j=1}^{k}(R_j)^2 = 14985$; $\therefore \chi_r^2 = 27.9$

Table 3.28: Ranks Assigned to 7 Problems of the Indigenous Contractors by Medium-Sized construction firms.

PROBLEMS	NO. OF COMPANIES																								Rj	$(Rj)^2$
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
Non-availability of funds	1	3	1	1	2	3	2	2	4	1	3	2	2	2	3.5	2	2	2	3	3	2.5	2	3	1	53	2809
Non-availability of materials	2	3	2	3.5	1	4.5	3.5	2	4	2	3	3	3	3.5	3.5	3.5	6	3	4	5.5	2.5	1	4.5	2	75.5	5700.25
Non-availability of plants/Equipment	3	3	4.5	3.5	3.5	4.5	3.5	2	4	3	3	3.5	4.5	3.5	5.5	3.5	5	4	1	5.5	2.5	4	4.5	3	89.5	8010.25
Shortage of Manpower	6.5	7	6.5	7	7	7	5	7	1	7	6.5	1	7	7	7	5.5	1	7	7	7	6	7	6	7	143	20449
Effect of Government Policies/Change of Government	6.5	6	6.5	2	6	2	1	6	2	6	1	5.5	1	5.5	1	1	7	1	2	1	2.5	3	1	6	82.5	6806.25
Lack of co-operation amongst parties to a contract	5	3	3	5.5	5	6	6	4.5	6	4	5	5.5	4.5	1	5.5	5.5	4	5	5.5	2	6	6	2	4	109.5	11990.25
Lack of qualified technical expertise	4	3	4.5	5.5	3.5	1	7	4.5	7	5	6.5	5.5	6	5.5	2	7	3	6	5.5	4	6	5	7	5	119	14161

$\sum_{j=1}^{k}(R_j)^2 = 69926;$ $\quad \chi_r^2 = 48.33$

Table 3.29: Ranks Assigned to 7 Problems of the Indigenous Contractors by Small Construction firms.

PROBLEMS	NO. OF COMPANIES																	Rj	$(Rj)^2$
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Non-availability of funds	1	1	1	2	1.5	1	2	1.5	1	1	1.5	1.5	1	2	1	1	2	23	529
Non-availability of Materials	3	2	3	3.5	1.5	4	1	1.5	4	2.5	1.5	1.5	2	1	6	2	1	41	1681
Non-availability of plants/ Equipment	5	5	6	1	4	3	4	4	6	4	4.5	3.5	4	3.5	3.5	4	4	69	4761
Shortage of Manpower	6.5	7	7	7	6.5	5.5	6	4	7	5	7	6	4	7	3.5	4	5	98	9604
Effect of Government Policies/Change of Government	2	3	2	3.5	4	2	3	4	5	2.5	3	3.5	4	3.5	2	4	3	54	2916
Lack of Co-operation amongst parties to a contract	4	5	4	5.5	6.5	5.5	6	6.5	2	6	4.5	6	6.5	5	6	6	6	91	8281
Lack of qualified technical expertise	6.5	5	5	5.5	4	7	6	6.5	3	7	6	6	6.5	6	6	7	7	100	10000

$\sum_{j=1}^{k}(Rj)^2 = 37772$; $\chi_r^2 = 68.11$

After the statistic(s), χ_r^2 have been calculated to be 27.9; 48.33; 68.11 for the different classifications of the construction firm, then its significances were tested. In all the cases above, N is large since it exceeds 9 and similarly K exceeds 3 so the use of the 'small sample' test suggested by Friedman was not applicable. The 'large sample' test was consequently adopted. In this case, χ_r^2, was distributed approximately as Chi Square, χ^2, with degree of freedom (df) = k-1.

Therefore df = 7-1

= 6

Reference to statistical table (See Appendix F) indicates that $\chi^2_{.05} = 12.59$. Thus in all the classifications of the construction firms, the Null hypothesis (Ho) is rejected because χ_r^2 calculated is greater than $\chi^2_{.05}$. Hence, it can be concluded, that all the classifications of the construction firms are in agreement as regards the ranking of these problems.

Following Siegel's suggestion, the 'true' ranking of the problems have been derived by the order of the various sums of ranks Rj as shown in Tables 3.27 to 3.29. It follows that in the large construction firms, the order of the problems is as follows in descending order:

- Non-availability of funds
- Non-availability of materials
- Lack of qualified technical expertise
- Lack of co-operation amongst parties to a contract
- Non-availability of plants/Equipment
- Effect of Government Policies/Change of Government
- Shortage of manpower

Similarly in the medium-sized construction firms, the order of the problems is as follows:-

- Non-availability of funds
- Non-availability of materials
- Effect of Government Policies/Change of Government
- Non-availability of plants/Equipment
- Lack of co-operation amongst parties to a contract
- Lack of qualified technical expertise
- Shortage of manpower
-

In the small construction firms the order of the problems were ranked as follows:

- Non-availability of funds
- Non-availability of materials
- Effect of Government Policies/Change of Government
- Non-availability of plants/Equipment
- Lack of co-operation amongst parties to a contract
- Shortage of manpower
- Lack of qualified technical expertise.

From the foregoings, it is obvious that non-availability of funds and materials are the most important problems to all the classifications of the firm while shortage of manpower is on the average the least important.

The slight differences in the orders of the ranking of these problems in the different classifications of the firm could be explained to be due to the unique characteristics and structure of the firms. For instance the non-availability of funds problem could be partially attributed to the inadequate collaterals by firms.

Other problems identified at follow-up interviews and discussions include the following:

(i) Weather Problem (especially for contractors handling projects in Riverine areas)

(ii) Consultants Problem

(iii) Organisational Problem

(iv) Management Problem

It was also deduced from the oral interview that main core of the indigenous contractors problems is management (lack of technical expertise, planning and managerial know-how).

These identified and ascertained problems form the basis for further discussions in chapter 4.

In an attempt to find solutions for the highly ranked non-availability of materials (Materials Acquisition) problem, respondents were requested to rank six factors considered to be the causes. Similarly, the same test as above was used. The responses are tabulated in tables 3.30 to 3.32.

Table 3.30: Ranks Assigned to 6 Causes of Materials Acquisition Problem by Large Construction firms.

CAUSES	NO. OF COMPANIES											Rj	$(Rj)^2$
	1	2	3	4	5	6	7	8	9	10	11		
Scarcity of Essential Materials	2	1	3.5	4	2	2	4	2	4	2	1.5	28	784
Government Policies(SAP,FEM etc)	6	4	1.5	3	2	4	3	4	1	3	3	34.5	1190.25
Bad Weather	4.5	6	5.5	5.5	5	3	5	6	5	5	6	56.5	3192.25
Fluctuation of Material Prices	1	2	1.5	1	2	1	2	1	2	1	1.5	16	256
Delay caused by Manufacturers	3	3	5.5	2	5	5	6	3	3	4	4	43.5	1892.25
Transportation Problem	4.5	5	3.5	5.5	5	6	1	5	6	6	5	52.5	2756.25

$\sum_{j=1}^{k}(R_j)^2 = 10071$; $\chi_r^2 = 30.58$

Table 3.32: Ranks Assigned to 6 Causes of Materials Acquisition Problem by Small Construction firms.

CAUSES	NO. OF COMPANIES																	Rj	$(Rj)^2$
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
Scarcity of Essential Materials	2.5	3	2	3.5	5.5	2	1	2	3	1	3	2	5	1	5.5	2	1	45	2025
Government Policies (SAP.FEM etc)	4.5	2	3	1.5	5.5	1	2	3	1	2.5	2	1	2.5	2	3	1	2	39.5	1560.25
Bad Weather	2.5	4	5	3.5	2	5	6	4	4	5	5	6	5	5	4	6	6	78	6084
Fluctuation of Materials Prices	4.5	1	1	1.5	1	3	3	1	2	2.5	1	3	2.5	3	2	4	3	39	1521
Delay caused by Manufacturers	1	5.5	5	5.5	3.5	5	4	5	5.5	5	5	4	5	5	5.5	4	4	77.5	6006.25
Transportation Problem	6	5.5	5	5.5	3.5	5	5	6	5.5	5	5	5	1	5	1	4	5	78	6084

$\sum_{j=1}^{K}(R_j)^2 = 23280.5$; $\chi_r^2 = 39.31$

The statistic(s), χ_r^2 have been calculated to be 30.58; 88.36; 39.31 for the different classifications of the construction firm, then its significances were tested using a large sample as presented by the data. χ_r^2 was then distributed approximately as Chi Square, χ^2 with df = k-1 = 6-1 = 5.

Reference to satistical table (See Appendix F) indicates that $\chi^2_{.05} = 11.07$. Thus all the classifications of the construction firms are in agreement as regards the ranking of the causes of materials acquisition problem since (Ho) is rejected.

Following Siegel's suggestion, the 'true' ranking of the causes of materials acquisition problem has been derived as shown in tables 3.30 to 3.32.

The orders of ranking of these causes in descending order by the different classifications of the firm are shown in table 3.32^B

Table 3.32[B]: Order of Ranking of the Causes of Materials Acquisition Problem.

Large firms	Medium-Sized firms	Small firms
- Fluctuation of Materials Prices	- Fluctuation of Materials Prices	- Fluctuation of Material Prices
- Scarcity of Essential Materials	- Scarcity of Essential Materials	- Government Policies
- Government Policies	- Government Policies	- Scarcity of Essential Materials
- Delay caused by manufacturers	- Delay caused by manufacturers	- Delay caused by manufacturers
- Transportation Problem	- Transportation Problem	- Bad Weather and Transportation Problem
- Bad Weather	- Bad Weather	

It can be deduced from the analysis that on the average in different classifications of the construction firm, fluctuation of material prices, scarcity of Essential materials and Government policies are the most important causes of materials acquisition problem while transportation problem and Bad Weather are the least.

3.5.4 CONTRACTORS PROSPECTS ASSESSMENT:

As regards the prospects of the indigenous contractors, all the respondents claimed that the future is bright. This was further supported when majority of the respondents opted for the adoption of management techniques in the industry in order to improve performance. This foresight is encouraging and helps to fulfill one of the objectives of this study (See Section 1.2).

These identified problems and comments on prospects form the basis for discussion in the next chapter.

3.5.5. Additional Comments by Respondents:

Provision was made in the questionnaire for any free comments by the respondents. The summary of the comments are as follows:

Expectation: Some of the respondents indicated their utmost desire to have a copy of the findings (if possible) of the investigation.

Hinderance: Lack of databanks for the construction industry creates some hinderances which if available would have improved the performance standards of the Construction Industry to an extent.

Wishes: Majority of the respondents wished the research student all the best as regards the investigation.

Suggestions:

(i) An investigation into the foreign (multinational) Construction Companies and their practices which makes them more successful was also proposed instead of the total focus on the indigenous contractors only.

(ii) The need for the production of building materials in this country would be welcomed

(iii) Attempts should be geared towards the computerisation of construction activities.

Time:

(i) It is hoped that the information supplied by completing this questionnaire would be useful, otherwise more time has been spent than can normally be afforded in this sort of exercise.

(ii) This is a long and time consuming exercise especially for busy business oriented contractors.

3.6 SUMMARY:

A survey was conducted to establish the actual practices in the indigenous construction firms and hence ascertain the problems and prospects of the indigenous contractors.

The number of Companies covered in the different classifications of the construction firms was fairly large and were almost evenly represented. The majority (92%) of the firms covered in the survey specialise in building and Civil Engineering Construction and most of the firms have a fairly good operational record.

Most of the respondents have attained maturity age, reasonably well-educated and experienced in the industry and occupying responsible managerial positions.

The survey revealed that the lumpsum contract based on BOQ, drawings and Specification and the Selective tendering method are generally preferred.

The creation of good working relationship between the contractor and his operational environment does not exist, instead it occurs by chance. The survey also revealed that pre-contract planning is not adequately carried out. As regards the application of management techniques, the most outstanding reasons given for its non-application are non-

familiarity with the techniques and lack of qualified technical expertise.

The major problems identified in the survey include non-availability of funds, non-availability of materials, non-availability of plants/Equipment, Shortage of manpower, Effects of Government Policies, lack of co-operation amongst parties to a contract, lack of qualified technical expertise, Weather problem, Consultants problem, organisational and management problem (core of the problems). The survey also revealed the causes of materials acquisition (non-availability of materials) problem.

As regards prospects, majority claimed bright future for the Industry and hence the Indigenous Contractors.

CHAPTER FOUR

IDENTIFIED INDIGENOUS CONTRACTORS PROBLEMS AND PROSPECTS

From the data collected and its analysis, the basis for the discussion of the problems and prospects of indigenous contractors have been established. The problems facing the indigenous contractors in the Construction Industry, apply in most cases to almost all the different classifications of the construction firms although in a few cases, the degree of effect of these problems vary.

4.1 PROBLEMS OF LARGE INDIGENOUS CONSTRUCTION FIRMS:

4.1.1 FINANCE:

Lack of funds was identified as one of the problems encountered in the Construction Industry by the indigenous Contractors in the course of project execution. Inadequate financial provision is a very common problem in both the private and public sectors although it was highlighted, that the situation is worse with the public sector clients whose slipshod financing arrangements for executing projects constitute a major cause of construction cost escalation and a constant source of irritation to the contractors.

This problem is caused mainly by the Consultants (Architects) in some cases, the clients and also the lack of co-operation from financial institutions. As regards the design consultants (Architects), contractors adduced that in some instances Architects do not issue certificates on time (as stipulated in the conditions of contract).

But when that is finally done by the Architect, the client does not effect payments as at the period stipulated. This situation occurs in most cases as a result of the following reasons:

- Wrong projection of eventual cost of project at inception and the clients inability to fund future cost overruns
- Client's overoptimistic projections of their revenue expectations which does not materialise
- Total reliance on procurement of funds from financial institutions.

Since majority of the respondents highly emphasized the fact that Governments are their largest clients, efforts were made to find out correct situations from some top officials in the Government sectors. Due to the oath of secrecy, what was proffered was that Government as a client does not carry out adequate planning and feasibility studies before awarding contracts. Also, there is this lack of priority among projects (proper identification of the need for a project), hence in most cases there is no determination to achieve the ultimate goals of the project since adequate planning is not made. Thus constituting problems to the indigenous Contractors. Contractors also attested to the fact that a substantial amount of their profits are lost as kickbacks in order to get payments for projects already executed. Also, lack of adequate financial assistance

from Banks cripples the contractor's financial capabilities and ultimately delays projects completion. But it could be argued as previously mentioned in the preceeding chapter that lack of collaterals might constitute one of the reasons for such un-friendly acts.

The consequence of the effect of this finance problem is that the contractor is lumbered with an avalanche of cash flow problems during construction, culminating in delays and in some cases abandonment, considering the fact that capital is the life-blood of any project.

4.1.2 MATERIALS ACQUISITION:

The non-availability of materials was also identified as one of the problems encountered by the indigenous contractors. It was ascertained to be caused by the following reasons:

(i) Fluctuation of Material Prices

(ii) Scarcity of Essential Materials

(iii) Government Policies (SAP, *FEM and others)

(iv) Delay caused by manufacturers

(v) Transportation Problem

(vi) Bad Weather

4.1.2.1 Fluctuation of Material Prices: Contractors adduced that the acquisition of materials poses a lot of problems due to the fact that material prices are always fluctuating.

*FEM - Foreign Exchange Market.

This leads to occasional variations and in some cases huge losses to the contractor and delays in project completion.

4.1.2.2 Scarcity of Essential Materials: Some of the materials specified by the consultants are imported and this tends to create delays for the contractors. Also because of the present government policies (high import duties), materials and plants/Equipment acquisition become a near impossible feat.

4.1.2.3 Delay Caused by Manufacturers: Occasionally manufacturers cause problem of delay for the contractors. This results from the fact that materials are not readily available when needed on site.

4.1.2.4 Transportation Problem: Majority of contractors that have handled or are currently handling projects in the riverine locations considered transportation as a major problem. Delays often occur on site due to transportation problem. Materials acquired are often lost because of the poor transportation resulting in huge losses to the contractors.

4.1.3 WEATHER CONDITIONS:

Contractors engaged on riverine project sites have the weather effect as one of their problems. The unpredictable weather (rains) occasionally results in floods and thus creates lots of problems for the contractors with regards to damages to projects and also preventing plans from being effectively executed.

In some cases, the unpredictable weather conditions delays completion of projects since partial abandonment often results. Heavy additional losses are also incurred by the contractors.

4.1.4 CONSULTANTS PROBLEM:

Contractors highlighted that the incompetence of some design consultants (Architects and Mechanical/Electrical Consultants) and also the hurried nature in which most jobs are done creates problems to them. This results in the supply of incomplete drawings/omissions and also frequent changes in designs and this affects the contractors.

4.1.5 ORGANISATIONAL PROBLEM:

This problem includes both the organisational structure of the construction firms and the leadership style. The leadership style exhibited in construction organisations lead to the poor result obtained from construction activities. In the large firms for instance which is characterised with board of directors and its many managers is yet to be properly and thoroughly organised in order to achieve better results. Due to the lack of proper co-ordination/communication within the firms, the adequate manpower level required is rarely obtained. For instance inexperienced site supervisors and unco-operative/stuborn workmen and employed.

Also, the issue of purposely creating very cordial relationship with other parties is not too common.

In the large construction firms, the directors and managers have not realised the need for trained manpower in order to achieve more realistic goals. Hence, the pancity of trained manpower at various levels of the firms.

There is also no adequate and capable expertise to co-ordinate the firm's activities. This has often resulted in strikes action as a result of lack of incentives from the company (administrative set-back) and has often led to delays in project execution.

4.1.6 MANAGEMENT PROBLEM:

From the oral discussion/interview carried out in Chapter 3, management problem was identified and ascertained as the core of the major problems of the indigenous contractors in the Construction Industry. This problem was identified to include lack of technical expertise, planning and managerial know-how.

Management problem also tends to incorporate some aspects of the organisational problem. This problem boarders on the management of resources (money (finance), machineries, materials and manpower) in the firms. As earlier mentioned, resources management are of utmost importance in the Construction Industry.

Due to the low level of technical expertise in the construction firms, much is not achieved. This lack of technical expertise also leads to the inability of adequate planning being carried out by the contractors.

machineries, materials and manpower) in the firm. As earlier mentioned, resources management are of utmost importance in the Construction Industry.

This lack of technical expertise also leads to the inability of adequate planning being carried out by the contractor. Optimal targets are not met and the desired results not achieved. The indigenous contractors are yet to appreciate the need for planning in the Construction Industry. As highlighted, majority of the respondents indicated the application of the bar chart techniques especially. At the follow-up interview it was revealed that the application of management techniques is not highly implemented due to a number of reasons most important among which were non-familiarity with the techniques and lack of technical expertise.

From the foregoing, it can then be opined that better results are rarely obtained in the Construction

Some respondents specifically pointed out that if management standards can be improved in the firms, the contractors would always meet the required standards. It was in line with this, that majority of the respondents opted for the adoption of management techniques by the indigenous contractors.

Finally it would be worth mentioning that the resultant effect of this problem is that resources are mis-managed, and therefore delays which often results to abandonment occurs on site.

4.2 PROBLEMS OF MEDIUM-SIZED CONSTRUCTION FIRMS

Just like in the large construction firms, the major problems earlier mentioned and discussed affect the medium-sized construction firms. Minor differences only occur in the organisational/leadership style but basically the problem still remains. Unlike in the large Construction firms, the medium-sized firms have fewer labour force. That not withstanding, problems still arise. The medium-sized firms surveyed were generally made up of mostly family members and this affects the leadership

effectiveness. The resultant effect of this on the organisation is a relatively low productivity.

The organisational/leadership problems result from lack of communication and co-ordination between the upper and middle managers. The Upper Managers tend to have direct relationship with the workers and take decisions without the consent of the middle managers. This in most cases results in problems which subsequently affect the progress of work on site.

4.3 PROBLEMS OF SMALL CONSTRUCTION FIRMS:

Among the prominent problems being encountered by contractors in the small.construction firms are those that can be grouped under the headings: finance, material/ Equipment acquisition, Consultants, Weather and most essentially Management.

4.3.1 FINANCE:

Like in the large and medium-sized construction firms, finance was identified as one of the major problems. The resultant effect on the contractors is that cash flow problems are created with the attendant retardation of progress of work on site. This leads to delays and subsequent abandonment.

4.3.2 MATERIALS AND EQUIPMENT ACQUISITION:

Its causes and consequences on this classification of firms are as previously discussed in the large and medium-sized construction firms.

4.3.3 CONSULTANTS PROBLEM:

The problem of incomplete drawings which leads to occasional variations and delays in project completion still remains like in the other classifications of the firm.

4.3.4 WEATHER CONDITIONS:

This problem creates problems to contractors handling projects in the riverine areas. It delays project completion and also huge financial losses.

4.3.5 MANAGEMENT PROBLEM:

This problem still exists in this classification of firm despite its size. Due to the averagely low level of technical expertise of the managers of these firms, planning and management of resources are not properly done. Application of management techniques are least applied in this classification of firms (as shown in the previous chapter) because of the main reasons which include: no perceived benefits and non-familiarity with the techniques.

From the identified and discussed problems of the indigenous contractors, it would be worth mentioning that of all the problems, the most important which was ascertained from the oral interviews and on which others emanate, is that of management.

4.4 PROSPECTS OF THE INDIGENOUS CONTRACTORS:

From the discussions with the contractors and part of

the analysis, it can be summarized that the following three major factors determine the prospects of the indigenous contractors:

(i) The construction activities overall level in the economy

(ii) The portion of such activities taken up by foreign firms and other agencies

(iii) Environmental obstacles presented.

This was supported by Akeredolu-Ale (1974).

All the respondents had the conviction that the future of the construction Industry is bright and so are the prospects of the indigenous contractors. Although a few respondents highlighted that due to the huge cost of execution of new projects, more efforts would be geared towards improving maintenance culture - alteration and refurbishment.

Respondents claimed that even though the prospects of the indigenous contractors are bright, the need for a more direct and serious look by the Government on its policies (SAP, FEM and others) on the control of material prices, fluctuation and scarcity cannot be over emphasized. Also the need for production of building materials was advocated.

The realisation of the ultimate aim of construction activities by clients is also very necessary. Therefore, more emphasise should be placed on competence rather than

monetary gains. This would further help to improve the contractors performance.

One of the greatest obstacles of the indigenous construction firms as identified by some of the respondents is the existence of the foreign firms who deprive them of challenging jobs. This they believe is as a result of lack of confidence and trust in them by the clients. In order to ensure better performance and trust in the bright future of the construction industry and hence the indigenous contractors, the need for the adoption/implementation of management techniques was highly accepted.

4.5 SUMMARY:

The outcome of the survey and analysis carried out in Chapter 3 led to the discussion of the identified major problems facing the indigenous contractors in the Construction Industry.

Even though the Construction Industry is composed of different types of contractors, each with a speciality of its own, the problems are still similar. Some of these problems are caused by the contractors themselves while others, are brought about by external factors including the industry's unique characteristics.

The major problems of the indigenous Contractors have been discussed but generally speaking, the core of the

problems facing the contractors that, according to Akande (1988) - See Section 1.1, has led to its uncertain and unenviable state, is that of management. This scarcity of management talents (lack of technical expertise/know-how, planning and managerial technocrats) has led to failures and low profit margins. It is in line with this problem that majority of the respondents though convinced about the bright prospects of the indigenous contractors, accepted the implementation of management techniques in its operations now and in the near future in order to meet the challenges of the Industry.

This is the pre-occupation of the next chapter in this research.

CHAPTER FIVE

PROPOSAL FOR ALLEVIATING THE INDIGENOUS CONTRACTORS PROBLEMS

5.1 PRE-AMBLE:

As clearly outlined in the preceeding chapters, the indigenous contractors problems are numerous. The main core of the problems which has resulted in generally low performance and dominance by expatriate firms is management problem (lack of technical expertise, planning and managerial know-how).

In chapter 3, the following reasons were given for the non-implementation of management techniques in management operations:

(i) Non familiarity with the techniques

(ii) No perceived benefits

(iii) Lack of time

(iv) Lack of qualified technical expertise

It was thus proffered that the non-implementation of these management techniques is basically due to the lack of adequate training or rather low-level of education of these personnels.

To meet the challenges of the bright prospects of the indigenous contractors, the need to minimize this management problem becomes very necessary.

5.2 TRAINING PROGRAMME:

This is proposed in order to improve the management skills of the indigenous contractors as well as improve their performance now and in the future.

Its main objective is to create awareness in the managers' of these construction firms and thus enable them employ competent hands (expertise) to carry out the management operations in the firm.

5.2.1 Scope of Training:

The training is meant to inculcate and thoroughly acquaint the indigenous contractors with the basic management techniques in order to improve the management style or operations in the industry.

The course should be run for a period of four days and should be regularly and jointly organised by the Departments in Universities where Construction Management is offerred at higher degree level and the Federation of Building and Civil Engineering Contractors.

The training should be done by well qualified and experienced Construction Management Consultants and/or Construction Managers in the industry. They should also have previous experience on such training.

The suggested four days training course may be programmed as follows depending on the convenience.

Programme for Day I

DURATION	ACTIVITIES
9.00 am - 11.00 am	Discussion Period: - General discussion on the Current situation in the Construction Industry - Individual experiences in the Industry - Identification of the major problems in the Industry and its causes - Suggestions on possible solutions
11.00am - 11.15am	Tea Break
11.15am-1.15pm	- General introduction of Construction Management techniques - Its Uses, advantages and disadvantages - Breakdown of the management techniques into Decision making 'tools' and planning techniques.

1.15pm-2.30pm	Lunch Break
2.30pm-4.30pm	- Introduction of the Micro-Computer Appreciation and Utilization in the Construction Industry. - Appreciation:- Software Playback of Computer Software - Utilization (Application): Transportation Problem, Resource allocation problem and so forth. - Advantages and Problems associated with its use
4.30pm-4.45pm	Short Break
4.45pm-5.30pm	Discussions and Questions on the day's lessons
END OF DAY I	

4.30pm-4.45pm	Short Break
4.45pm-5.30pm	- Take-home assignment on practical applications of Operations Research as a decision making tool in the Construction Industry. - Recapitulation on decision making tools (statistics/ Probability theory and Operations Research).
END OF DAY 2	

Programme for Day 3

DURATION	ACTIVITIES
9.00am-11.00am	- General discussions on how planning, monitoring and controlling of project work is carried out in order to achieve targetted dates. - General introduction of Construction planning Techniques: Bar (Gantt) Chart, Line of Balance, Network Analysis (CPM). - Topic: Bar (Gantt) Chart - Its Origin, Illustration of basic representation on the class-board.

11.00am-11.15am	Tea Break
11.15am-1.15pm	- Lesson on Bar (Gantt) Chart continues - Application of Bar Chart to management problems in the construction Industry - Advantages and disadvantages of Bar Chart. - Class exercise on typical application in the Construction Industry
1.15pm-2.30pm	Lunch Break
2.30pm-4.30pm	- Lesson on planning techniques continues - Topic: Line of Balance (LOB) - Introduction of LOB, Brief history of its origin, practical representation of LOB on the classboard - Basic formulae involved - Advantages and disadvantages - When best to be applied
4.30pm-4.45pm	Short Break
4.45pm-5.30 END OF DAY 3	- Class exercise on the drawing of LOB with particular reference to an application in the Industry

Programme for Day 4

DURATION	ACTIVITIES
9.00am-11.00am	- General Introduction to Network Analysis - Topic: Critical Path Method (CPM) - Origin, Basic representation of symbols on board, Representation of a simple network diagram on classboard
11.00am-11.15am	Tea Break
11.15am-1.15pm	- Lesson on CPM continues - Application with regards to: Time Analysis, Critical Events, Critical Activities, Critical Path - Class exercise on more complicated networks; identifying the critical path, critical activities and events.
1.15pm-2.30pm	Lunch Break
2.30pm-4.30pm	- Application of CPM for project control (cost control inclusive), resource allocation - Application of CPM for crashing of cost and time - Advantages and disadvantages of CPM application
4.30pm-4.45pm	Short Break
4.45pm-5.30pm END OF COURSE	- Recapitulation of all the techniques studied - Further discussions on the application and usefulness of these techniques

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

Attempts have been made in the preceeding chapters to identify and discuss the main problems of the indigenous contractors and their prospects. The conclusions and recommendations drawn from this study are discussed as follows:

6.1 CONCLUSIONS:

It has been shown that the responsibilities of the contractors and that of the other parties to the contract are very essential in order to achieve the ultimate aim of construction. This further goes to emphasize the need/ importance of cordial relationship between contractors and the other parties to the contract. The contract system was also highlighted.

The different management techniques were shown, their benefits highlighted. It includes most essentially ensuring that the ultimate aim of the contract objectives are achieved through effective management of resources.

The research constrained essentially to the East of the country, has revealed that the problems of the indigenous contractors are numerous and diverse, but yet similar to the different classifications of the firm. Some are caused by the contractors themselves while other

are caused by the other parties and the industry's unique characteristics. In spite of these, their prospects are bright.

As regards the relationship between contractors and the other parties to the contract, the survey revealed that this occurs by chance and partially contributes to the averagely poor performance standards, and this is a very poor result from the construction firms. The relationship between contractors and clients hinders progress of work on site. As revealed, the slipshod attitude of clients as regards payments/proper co-ordination of their projects due to inadequate financial provision and lack of proper identification of project needs, disrupts the contractor's cash flow and often leads to delays and subsequently, abandonment. In addition, financial institutions do not give the required assistance to contractors during projects execution. The consultants (Architects in particular) also cripple/retard contractors progress by not preparing payment certificates as at when due and also incomplete drawings. The survey also revealed that the present policies of the Government as the largest client (SAP, FEM and others), affects contractors and the Construction Industry to a large extent since the acquisition of materials/plants and Equipment is a very difficult task.

From the study, it can be concluded that the greatest problem/core of theindigenous contractors is that

of scarcity of management talents (lack of technical expertise, planning and managerial know-how). This was proffered to be due to the generally low level of education of the indigenous contractors. As shown, the application and benefits of management techniques is yet to be fully incalcated and appreciated by the contractors.

Considering the highly competitive and risky nature of the Construction Industry and also the downward economic trend of Nigeria, the need for the indigenous contractors to adopt management skills/techniques to improve managerial efficiency and overall project profitability becomes very necessary. Hence, the training programme was proposed to acquaint contractors with the basic managerial skills. It is opined that the proposed model advocated herein if conscientiously adopted, would justify the use of management techniques in terms of efficient management of resources in all respects.

Finally there is no illusion that the proposed approach and other recommendations (See Section 6.2) are ideal or panacea. Rather, they are advocated as a commencement step for the indigenous contractors who have performed below expectations as highly acclaimed, and thus need to face the challenges of a highly competitive and risky industry.

6.2 RECOMMENDATIONS:

Arising from the above, it has become relatively clear that in order for the speculated bright future to be achieved, we must be willing to make adjustments. The following recommendations are thus made:

The organisational set-up style of the indigenous construction firms should be highly improved in terms of communication links. This would help to ensure or create better working relationships between the contractor and the other parties to the contract.

The Clients should realise their expectations and responsibilities in contract. Adequate planning which should include identification of need, feasibility of the project and availability of funds, executive capacity, monitoring and operational expertise on completion should be ensured.

The financial institutions should as a matter of urgency revert its attitude towards the indigenous contractors by granting loans.

The Government should look into ways of minimizing the effects of its present policies on contractors.

6.2.1. Suggested Areas for further studies:

In the process of conducting this study, related research areas of interest emerged. These could not be treated within the scope of the study and hence are being recommended for further studies as follows:

(i) General review of registration of Contractors

(ii) Encouragement and production of local building materials.

(iii) Harnessing relevant construction information into databanks and micro-computer utilization.

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APPENDIX - A

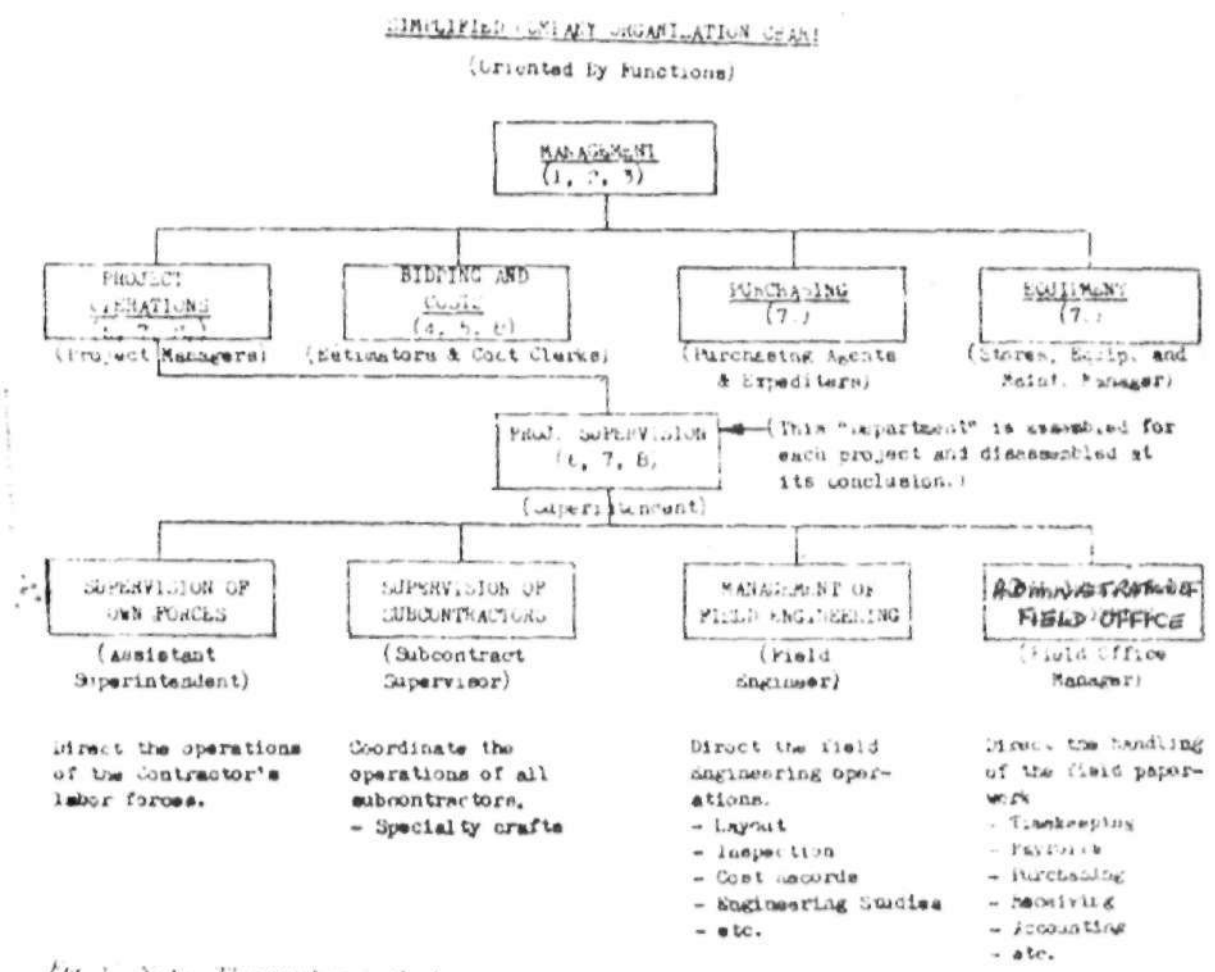
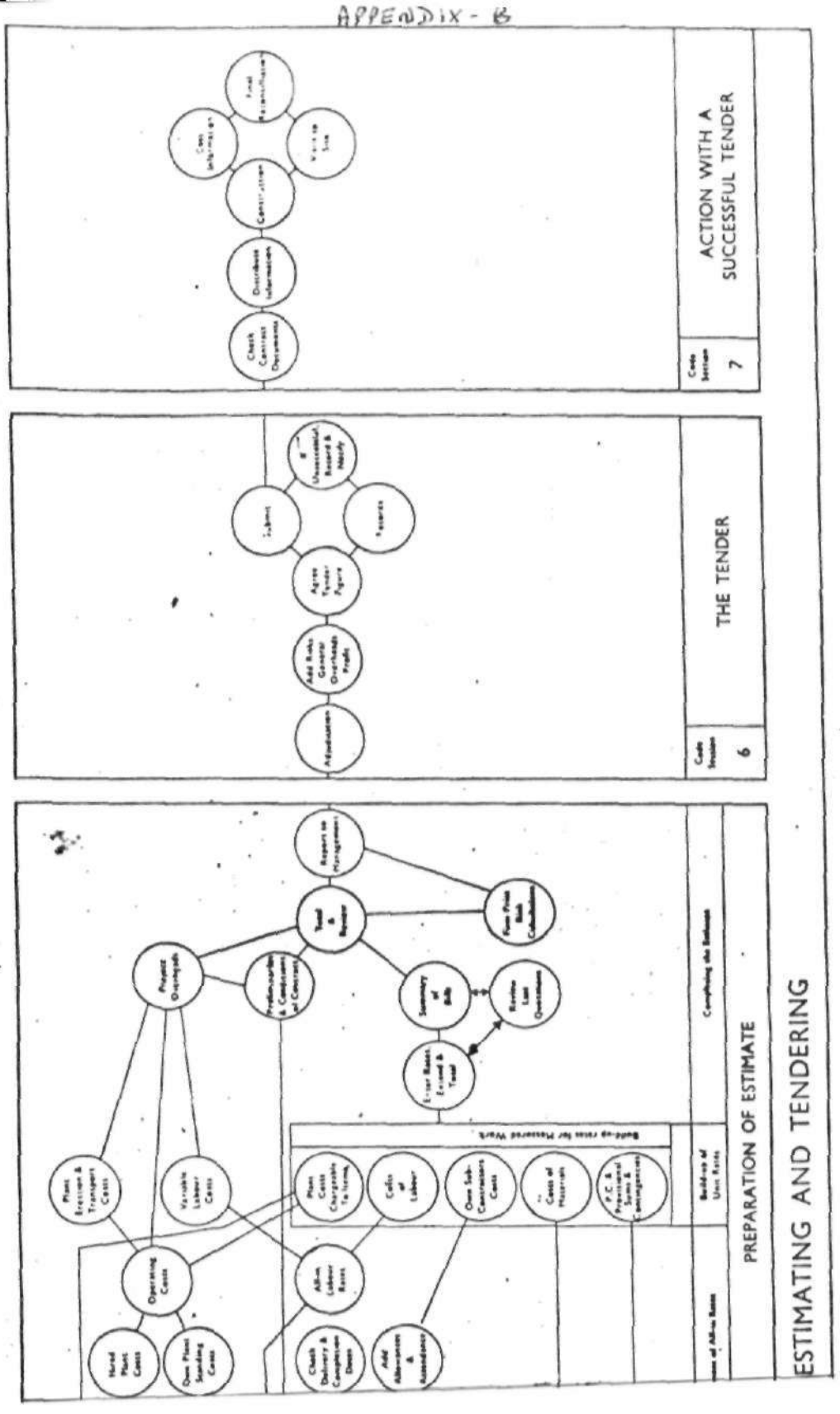


Fig. 2 Note: The numbers in the boxes represent the sections which denote the business area of the firm.

SOURCE:- The Construction Industry in Nigeri
(Proceedings of the 1974 Annual Conference of the Nigerian Economic Society).

Odepidan (1974)



SOURCE: Institute of Building, Code of Estimating Practice (1974)

NIGERIA: DOMESTIC AND FOREIGN COMPONENTS OF THE SUPPLY OF SOME MAJOR CONSTRUCTION MATERIALS OF SELECTED YEARS

CONSTRUCTION MATERIALS

Years Supply	Cement ('000 Tons)	Roofing Sheets '000 Tons)	Paints and Allied Products (Million Litres)
1970			
Domestic Production	587	47,597	2,287
Imports	459	13,831	433
Total	1,046	61,428	2,720
Percentage Share of Imports	43.9	22.5	15.9
1971			
Domestic Production	654	70,338	2,486
Imports	962	26,747	693
Total	1,616	97,085	3,169
Percentage Share of Imports	59.6	27.5	21.8
1972			
Domestic Production	1,103	62,413	8,738
Imports	699	9,173	795
Total	1,802	71,586	9,533
Percentage Share of Imports	38.8	12.8	8.3
1974			
Domestic Production	1,199,800	70,100	14,100
Imports	1,061,300	7,500	3,800
Total	2,261,100	77,600	17,900
Percentage Share of Imports	46.9	9.7	21.2
1975			
Domestic Production	1,275,900	110,300	18,800
Imports	2,047,800	4,800	8,900
Total	3,047,800	115,100	27,700
Percentage Share of Imports	16.6	4.2	32.1
1976			
Domestic Production	1,273,400	128,900	22,300
Imports	1,751,500	63,000	9,400
Total	3,024,900	191,900	3,700
Percentage Share of Imports	57.9	32.8	29.7
1977			
Domestic Production	1,305,900	160,400	30,300
Imports	6,846,300	401,300	12,900
Total	8,152,200	561,799	43,200
Percentage Share of Imports	84.0	71.4	29.9

SOURCE: CONSTRUCTION (The Journal of the Federation of Building and Civil Engineering Contractors) Olaloku (1987)

AHMADU BELLO UNIVERSITY

ZARIA — NIGERIA

DEPARTMENT OF BUILDING

Head of Department

Telephone: 32691

Telegrams: UNIBELLO ZARIA

Your Ref: .....

Our Ref: .....

Date 24th January, 1980 19....

Dear Respondent,

The attached questionnaire is concerned with problems and prospects of indigenous contractors in the Construction Industry. As you already know, the performance of the indigenous contractors is on the average below expectations. It is presumed that quite a number of factors lead to this inefficient performance of the contractors and we hold the view that these problems can be solved by the application of modern analytical/planning tools. This approach if properly implemented would be beneficial to the construction Industry. To successfully do this, we need to gain insight intb your view as a principal actor so that our attempt to provide a solution will be in an environment of realism. The importance of your help in providing facts, evaluations and judgements called for in this questionnaire cannot be over emphasised.

We wish to assure you that all the data supplied in completing this questionnaire will be held in Strictest Confidence and will be reported only in the form of statistical summaries hence, the identification of a particular company/ individual is virtually impossible.

Your prompt attention (inspite of your busy schedule) and co-operation would be very highly appreciated as it would facilitate the speedy realisation of the objectives of the study.

Yours sincerely,

Dr. J. O. Kolawole
(Chairman, Supervisory Committee)

Owor, N. F. (Miss)
(Research Student)

APPENDIX - E

QUESTIONNAIRE ON THE PROBLEMS AND PROSPECTS OF INDIGENOUS CONTRACTORS IN THE CONSTRUCTION INDUSTRY

1. Name of Respondent (Optional):----------

---

2. Address of Respondent:----------

---

3. Please indicate your age in one of the following categories (tick one).

(i) 24 - 30 years ☐

(ii) 31 - 36 years ☐

(iii) 37 - 40 years ☐

(iv) 41 - 50 years ☐

(v) Over 50 years ☐

4. Please indicate the highest qualification you have attained stating the field of specialisation applicable.

			SPECIALISATION
(i)	First School Leaving Certificate	☐	----------
(ii)	WASC/GCE/Grade II	☐	----------
(iii)	OND/HND/B.Sc.	☐	----------
(iv)	Postgraduate Diploma/Degree	☐	----------
(v)	Others(Please specify)	- - - - -	----------

5. How long have you been a staff of your Company?

(i) Under 3 years ☐

(ii) 3 - 6 years ☐

(iii) 7 - 9 years ☐

(iv) Over 9 years ☐

6. Please indicate your status in the company

(i) Director ☐

(ii) Project/Contract/Construction Manager ☐

(iii) Plant Manager ☐

(iv) Engineer ☐

(v) Chief Estimator/Quantity Surveyor ☐

(vi) Architect ☐

(vii) Foreman/Supervisor ☐

(viii) Other (please specify) ----------

7. Name of Construction Company (optional)----------

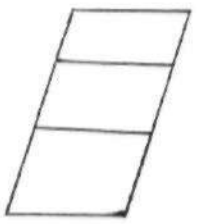
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8. Address of Construction Company:----------

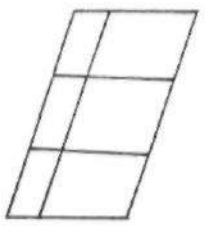
(if different from No.2 above) ----------

9. Please state your registration category indicating whether it is Federal, State or Local Government levels.

CATEGORY



LEVELS



10. How long has the company been in existence?

(i) Under 3 years ☐

(ii) 3 - 6 years ☐

(iii) 7 - 10 years ☐

(iv) Over 10 years ☐

11. Please indicate your Construction Speciality.

(i) Building Only ☐

(ii) Civil (roads, bridges etc) only ☐

(iii) Building and Civil ☐

(iv) Others (please specify)----------

12. How many projects have you handled in the past 5 years

----------Number

13. How many were completed on schedule?

----------Number

14. How many at different sites are you currently handled?

----------Number

15a. How many of the following professionals does you company currently maintain on the payroll?

(i) Project/Contract/Construction Manager(s) ☐

(ii) Architect(s) ☐

(iii) Quantity Surveyor(s) ☐

(iv) Engineer(s) ☐

(v) Builder(s) ☐

(vi) Others (please specify)----------

15b. Please indicate if the shortage or absence of any of the professionals listed in No.15(a) above is as a result of the factors below:

(i) Scarcity of qualified manpower ☐

(ii) State of the Economy/lack of funds ☐

(iii) No perceived benefit ☐

(iv) Others (please specify)----------

16a. Which of the following contracts do you sign most often?

(i) Lump Sum Contracts on drawings and specification only ☐

(ii) Cost reimbursable Contract ☐

(iii) Target Cost Contract ☐

(iv) Package deal or turn key contract ☐

(v) Others (please specify)----------

16b. Please state with reason(s) which of the following types of contracts listed above you prefer.

---

17. Please indicate with reason(s) which of the following types of tendering methods you prefer.

REASON(S)

(i) Competitive ☐ ----------

(ii) Negotiated ☐ ----------

(iii) Selective ☐ ----------

18. On the average, do you consider the relationship between your company and:

	VERY CORDIAL	CORDIAL	NOT CORD
(i) The Design Consultants as			
(ii) The Sub-contractors as			
(iii) The Materials Vendor as			
(iv) The Equipment Vendor as			
(v) The Client as			
(vi) The Finance Institute as			

19a. Please indicate if you have suffered from non-payments for jobs already executed.

YES ☐ NO ☐

19b. If 'YES' please comment briefly on its effect on your company.

---

20. Below is a partial lists of factors considered to be of importance when considering bidding for a particular project. Add any other relevant factors and please indicate (by ticking) the most important factors considered by your company.

(i) Size of project ☐

(ii) Location of project ☐

(iii) Site conditions ☐

(iv) Name of client and consultants ☐

(v) Financial requirement of the project ☐

(vi) Plant requirement of the project ☐

(vii) Availability of materials ☐

(viii) Type of contract ☐

(ix) Resource availability ☐

(x) Current and Immediate future workload ☐

(xi) Level of Competition ☐

(xii) Possible Weather Effect on the project ☐

(xiii) Political Effect on the project ☐

(xiv) Costs of preparing the bid ☐

(xv) Technology (method of Construction ☐

(xvi) Others (Please specify)----------

---

21. Does your company adopt any analytical management techniques in the course of contract management?

YES ☐ NO ☐

22. If 'YES', please indicate which of the following decision making tools applicable.

(i) Statistics and Probability theory ☐

(ii) Operations Research ☐

(iii) Others (please specify)----------

---

23. Please indicate which of the following planning techniques are adopted in your management operations.

(i) Bar (Gantt) Chart ☐

(ii) Network Analysis (CPM) ☐

(iii) Line of Balanace ☐

(iv) Computer Approach ☐

(v) Others (Please specify)----------

---

24. If answers to No.22 and/or No.23 above are 'not applicable' to your company, then indicate which of the following reason(s) are accrued to your company.

27. Comment briefly on the prospects of the indigenous Contractors.

---

28. Do you perceive that by implementing analytical decision making tools and planning techniques in management operations, the future of the indigenous Contractors would be brighter?

YES [ ] NO [ ]

29. Any additional comments:----------

THANK YOU FOR YOUR VALUABLE TIME, IMMENSE CO-OPERATION AND ASSISTANCE.

Table D/ Distribution of χ^2 (Continued)

n	0.30	0.20	0.10	0.05	0.02	0.01	0.001
1	1.07	1.64	2.71	3.84	5.41	6.64	10.83
2	2.41	3.22	4.60	5.99	7.82	9.21	13.82
3	3.66	4.64	6.25	7.82	9.84	11.34	16.27
4	4.88	5.99	7.78	9.49	11.67	13.28	18.46
5	6.06	7.29	9.24	11.07	13.39	15.09	20.52
6	7.23	8.56	10.64	12.59	15.03	16.81	22.46
7	8.38	9.80	12.02	14.07	16.62	18.48	24.32
8	9.52	11.03	13.36	15.51	18.17	20.09	26.12
9	10.66	12.24	14.68	16.92	19.68	21.67	27.88
10	11.78	13.44	15.99	18.31	21.16	23.21	29.59
11	12.90	14.63	17.28	19.68	22.62	24.72	31.26
12	14.01	15.81	18.55	21.03	24.05	26.22	32.91
13	15.12	16.98	19.81	22.36	25.47	27.69	34.53
14	16.22	18.15	21.06	23.68	26.87	29.14	36.12
15	17.32	19.31	22.31	25.00	28.26	30.58	37.70
16	18.42	20.46	23.54	26.30	29.63	32.00	39.25
17	19.51	21.62	24.77	27.59	31.00	33.41	40.79
18	20.60	22.76	25.99	28.87	32.35	34.80	42.31
19	21.69	23.90	27.20	30.14	33.69	36.19	43.82
20	22.78	25.04	28.41	31.41	35.02	37.57	45.32
21	23.86	26.17	29.62	32.67	36.34	38.93	46.80
22	24.94	27.30	30.81	33.92	37.66	40.29	48.27
23	26.02	28.43	32.01	35.17	38.97	41.64	49.73
24	27.10	29.55	33.20	36.42	40.27	42.98	51.18
25	28.17	30.68	34.38	37.65	41.57	44.31	52.62
26	29.25	31.80	35.56	38.88	42.86	45.64	54.05
27	30.32	32.91	36.74	40.11	44.14	46.96	55.48
28	31.39	34.03	37.92	41.34	45.42	48.28	56.89
29	32.46	35.14	39.09	42.56	46.69	49.59	58.30
30	33.53	36.25	40.26	43.77	47.96	50.89	59.70

SOURCE: Siegel (1956): Non-Parametric Statistics for the Behavioural Sciences