COST OVERRUNS AS CORRELATE OF QUALITY CONTROL IN BUILDING PROJECT IN ABOH MBIASE LOCAL GOVERNMENT AREA, IMO STATE

BY

EJIKE, Samuel Chukwuemeka

2016/1/63819TI

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION

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A PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

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IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF TECHNOLOGY (B.Tech) IN SCIENCE EDUCATION

DECLARATION

I hereby declare that this thesis titled: **"Cost Overruns as Correlate of Quality Control in Building Project in Aboh Mbiase Local Government Area, Imo State"** is a collection of my original research work and has not been presented for any other qualification anywhere. Information from other sources (published or unpublished) has been duly acknowledged.

EJIKE, Samuel Chukwuemeka   -----------------------------

2016/1/63819TI   Signature & Date

FEDERAL UNIVERSITY OF TECHNOLOGY,

MINNA, NIGERIA.

CERTIFICATION

The thesis titled: "**Cost Overruns as Correlate of Quality Control in Building Project in Aboh Mbiase Local Government Area, Imo State**" by EJIKE, Samuel Chukwuemeka (2016/1/63819TI) meets the regulations governing the award of degree of Master of Technology of the Federal University of Technology, Minna and it is approved for its contribution to knowledge and literary presentation.

Dr. Bala Muhammad   _____
Supervisor   Signature & Date

Dr. T. M. Saba   _____

Head of Department   Signature & Date

Prof. Yabuwa P. S.

03/04/2023

External Supervisor   Signature & Date

DEDICATION

This project is dedicated to Almighty God, the most merciful, the most beneficent, the most gracious, the omnipresent and omniscient.

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ABSTRACT

The study assessed the effect of cost overruns as correlate of quality control in building project in South-East, Nigeria. Three objectives were formulated the study, three research questions were raised to guide the study, three hypotheses were formulated at 0.05 level of significance. The research design that was used in carrying out this study is a survey research design. The targeted population for this study 118 respondents comprised of 38 project managers 50 contractors and 30 Quantity Surveyors. The sample size for the study comprises of 118 respondent, that is the entire population of the Study, there was no sampling due to the manageable size of the population. The data collected was organized in line with the research question and hypothesis formulated for the study. Statistical Package for the Social Sciences (SPSS Version 23) was used for the analysis. Mean and standard deviation was used to answer the research questions, while z-test statistics was used to test the null hypothesis. The findings of the result revealed that all the items agreed with the mean average 2.50-3.26 on the causes of cost overrun in building project based on decision rule. The findings also revealed that all the respondent agreed with the mean average from 2.50-3.33 on the impact of cost overrun in building project. The study found that there is high impact of cost overrun in building project. Furthermore the study shows that the respondents agreed on the mitigating measures for cost overruns in building projects. The study recommends that the professionals in building industry should be conscious of time delays which have a direct impact on sustainability and on existing infrastructure system. It was also recommended that professionals in the construction should plan very well which is the most essential component of project management and the biggest weapon against cost overruns and delays.

TABLE OF CONTENTS

Contents	**Pages**

List of Table

CHAPTER ONE

1.0   INTRODUCTION

1.1 Background to the Study

Construction industry is one of the most significant industries that contribute toward socio- economic growth especially to developing countries and the Nigerian construction industry is not an exception to this (Hussin *et al.,* 2013). According to Isa *et al.* (2013), the construction industry contributes about three percent (3%) to Nigeria's Gross Domestic Product (GDP). Construction creates, builds and maintains the workplaces in which businesses operate and flourish, the homes in which people live and the schools, hospitals which provide the crucial services that society needs and the

important economic infrastructural project like buildings and roads that keeps the nation connected (Department of Business Innovation and Skills, 2013).

Projects are usually assessed based on cost, schedule, and scope criteria. There are indications that many projects fail on one or a combination of these criteria. Poor project performance is actually not a new phenomenon, for according to Ramabhadran (2018), time overruns in construction industry is commonplace. Projects are known to have been plagued by cost and schedule overruns (Abdul Azis, 2012). This has, however, not made cost overrun an acceptable phenomenon. An inference from stakeholders that are concerned about these failures as they often lead to extensive delays and the inability to satisfy the initial time and cost. Indeed, some sources opined that it is rare to find projects that have been completed within estimated budget. Project cost overrun is known to exceed the anticipated cost of the project by almost 100% (Moore, 2017). Overshooting the project budget or exceeding the project duration is not peculiar to a particular sector of the economy (Dmaidi, 2013). The risk of material cost fluctuation is inherent in infrastructure projects, and to some extent is taken into consideration in overall project cost estimates; nonetheless, any delay in project completion time makes the initial cost estimates obsolete leading to cost overruns (Tejale *et al*., 2015).

Cost overruns in projects are one of the most critical issues during the execution of construction projects. Unfortunately, government policy makers and planners do not seem to learn from past mistakes as the magnitude of cost overruns has not improved over the last several decades (Flyvbjerg *et al*., 2016). Mahamid and Bruland (2011) conceded that researches on construction projects in some developing countries indicate that by the time a project is completed, the actual cost exceeds the original contract cost by about 30%. These overruns vary in frequency and magnitude for different projects.

An appraisal conducted by Bustani (2004) the tender evaluation practice in the public sector and found that construction project in Nigeria are procured at prices much higher than the cost at which they were initially evaluated. An investigation of the statistical relationship between actual and estimated costs of road construction in Norway by Odeck (2004) revealed mean cost overrun of 7.9% ranging from -59% to +183%. Jagboro (2005) cited in Ubani, Okorocha, and Emeribe (2015) found that cost overruns occur more frequently and are more severe problem than time overruns on building projects in Nigeria. Omoregie and Radford (2006) reported that the minimum average percentage of project cost escalation in Nigeria was 14%. However, Binchak (2008) discovered cost overrun of 41.7% on the provision of infrastructure projects in Abuja, Nigeria. Similar to Omoregie and Radford (2006) findings, a survey of construction cost performance in Brazil by Franca and Haddad (2018) revealed that 71% of 231 contracts exceeded their budget by 14%. It is imperative that construction projects be completed within the scheduled time, within the budgeted cost, and meet the anticipated quality.

Quality Control (QC) is the specific implementation of the (QA) program and related activities. Effective (QC) reduces the possibility of changes, mistakes and omissions, which in turn result in fewer conflicts and disputes (Arditi, 2016). As mentioned earlier, quality in construction is too important to be left to chance. A look at history gives some insight into the problem. Through the first half of the 20th century, engineers and architects were in total control during the design phase. During the construction phase they carried out a role described as 'supervision', insuring that the owner received his money's worth in terms of quality. In the 1950s and 1960s, owners became increasingly concerned with cost, schedule and areas where design professionals were not providing good control (O'Brien, 2018). The emphasis continued to be on quality and control of exposure to liability. At about the same time,

the widespread use in the public sector and, to a large degree, in the private sector, of the sealed competitive bid gave the owner the advantage of competitive pricing, but also forced the general contractor to look for every advantage during construction to control cost and maintain a profitable stance in the construction Industry.

However, the construction industry being a complex industry is faced with severe problems of cost overruns (Abd Karim, 2013). Cost overrun is a common problem in both the developed and the developing nations, making it difficult to complete many projects within budget. Being a common problem, Allahaim and Liu (2012) reported that cost overruns were found across 20 nations and five continents. Cost overruns affect 90% of completed projects (Flyvbjerg *et al.,* 2014). However, the majority of developing countries experience overruns exceeding 100% of the initial budget (Memon, 2013). The argument in the construction industry is on how to reduce or totally remove cost overruns from projects that have been ongoing among built-environment professionals, project owners, and users for the past 70 years (Allahaim & Liu, 2012). There is, however, no substantial improvement or significant solution in mitigating its detrimental effects (Allahaim & Liu, 2012). Based on this insight, therefore the study assessed cost overruns as a correlate of quality control in building project in Aboh Mbiase Local Government Area, Imo State.

1.2 Statement of the Problem

The major source of most of the problems we have in Nigeria and offcourse, the reason for the continued occurrence of buildings cost overruns all boil down to inflation. High level of inflation and intense price fluctuations that were not considered during the tender period now set in and cost overruns occur, the contingency does not take into account the inflation, which is always on the rise.

Another problem is that the contract award process lacks transparency and accountability. The procurement system has completely been abused. Politicians usually influence the awards of contracts to companies they have interest in. Of course, these companies give something to the politicians in return for ensuring they are awarded the jobs. Additional cost is usually incurred whenever a project is delayed. This cost is not always in financial terms. For instance, Mbachu (2014) who observed that consequences of overrun include project abandonment, drop in building activities, bad reputation and inability to secure project finance or secure projects at higher costs due to added risks, equally noted that these affected quality of projects at both individual and the industry level. As these errors in estimating costs usually manifest itself during the execution stage, the incidences of cost growth at either bid time or during project execution could be greatly reduced if attention were paid early enough to internal causes of cost overrun (Ramanathan, 2013). On this note the study assess the effect of cost overruns as correlate of quality control in building project in Aboh Mbiase Local Government Area, Imo State.

1.3 Purpose of the Study

The purpose of the study is to assess the effect of cost overruns as correlate of quality control in building project in South-East, Nigeria. Specifically the study will determine;

1. the causes of cost overrun in building project
2. the impact of cost overrun on quality in building project
3. the measures for mitigating of cost overruns in building projects

1.4 Research Questions

The following research questions were raised to guide the study

1. what are the causes of cost overrun in building project ?

2. what are the impact of cost overrun on the quality of building project ?

3. what are the measures for mitigating cost overruns in building projects ?

1.5 Significance of the Study

The findings of this study would be of immense benefit to project managers, construction industry, architect, construction managers, contractors, client and government.

The study will be beneficial to project managers at various levels, the information from the findings will be used in the management of construction project cost and time. Since actual cost and duration of projects do vary from initial targets, the results are delays in situations where sudden and sufficient additional resources are not immediately available to complete the project.

The study will be beneficial to contractors at the construction stage, cost and time influencing factors interact, contractors and consultants usually lack ideas on how much such interaction impacts on project cost and duration, until the end of construction. The findings will serve as a mechanisms for forecasting the magnitude of the inevitable extra funds and additional time, while the project is ongoing.

The construction industry will benefit from the study with the needed information required for effective and efficient control on the cost of construction projects among construction resource estimators, particularly in the Nigerian building industry.

The findings will be beneficial to clients and consultants by the provision of guidelines for the determination of extra funds and time required for project completion.

The findings will be beneficial to the project monitoring agencies like the Nigeria Bureau of Public Procurement (BPP), with the necessary information to assist and developed cost and time impact assessment information for their services.

Construction managers will use the findings to update on the significant of construction contract, and also to improve construction managers' knowledge and awareness in the current level of poor performance in the project management field, towards successful projects in the future.

Architects in Nigeria as well as construction project cost accountants may use the result of the study to improve on the existing knowledge of variability between the initial and final cost-and-time objectives, caused by levels of construction project complexity.

1.6 Scope of the Study

The study assess cost overruns as correlate of quality control in building project in Aboh Mbiase Local Government Area, Imo State. The study is limited to the causes of cost overrun in building project, the impact of cost overrun in building project and the mitigating measures for cost overruns in building projects. The study will be limited to residential buildings in Aboh Mbiase Local Government Area, Imo State. The study will be carried out in south-east and will cover sample local government area. The duration of the study will be carried out in eight weeks.

1.7 Hypotheses

The following null hypotheses were formulated and will be tested at 0.05 level of significance

H0$_1$: There will be no significant difference among the responses of contractors, project managers and quantity surveyors on the causes of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State

H0$_2$: There will be no significant difference among the responses of contractors, project managers and quantity surveyors on the impact of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State

H0$_3$: There is no significance difference between the response of contractors, project managers and quantity surveyors on the mitigation measures for cost overruns in building projects in Aboh Mbiase Local Government Area, Imo State

CHAPTER TWO

2.0   **LITERATURE REVIEW**

2.1 Concept of Quality

The concept of quality management is as an approach to ensure that a whole organisation is involved in producing high quality outcomes in everything they do. According to Willar (2017) earlier researchers in the quality movement there is no particular definition for quality in construction. Quality can be defined according to American Society of Civil Engineering (ASCE, 2013) as meeting the legal, aesthetic

and functional requirements of a project. These requirements may be simple or complex, or they may be stated in terms of the end result required or as a detailed description of what is to be done.

This research identified sections of quality management mainly from TQM and ISO 9001 standards, including the challenges or factors affecting quality management and quality improvement practices in the global construction industry. For construction projects, quality management means making sure things are done according to the plans, specifications, and permit requirements. The days of embarking on projects which usually involve huge funds without due diligence and proper regulation seem to be over, making it imperative that communities get the most out of their infrastructure projects (Arditi, 2014). Gunaydin (2017) opined that one of the best ways to assure good construction projects is to use an inspector. The first step an inspector should take is to become familiar with the plans, specification, and permit requirements and, equally important, to ensure quality control during all construction phases needs to be better, and the utility system needs to know what is being installed while the work is being done. On most construction jobs, the inspection is one of the last things to be done if it gets done at all.

2.1.1 Quality Management in Nigeria

The Nigerian construction industry produces nearly 70% of the nations fixed capital formation, And its performance within the economy has been, and continues to be on the increase. But despite the increased growth of the sector the Nigerian construction industry's contribution to the country's Gross Domestic product (GDP) of 3.05% as at the close of 2012 is still below the World Banks average of employment in the construction sector of about 3.2% in developing countries. Whereas the sector has remained consistently on the increase in terms employment to about 7.6% of the total

employed citizens both directly and indirectly after rebasing of the Nigerian economy according to reports from National Bureau of Statistics (2015). The construction sector is globally considered to be a basic industry on which the development of a country depends. To a great extent, the growth of a country and its development status is generally determined by the quality of its infrastructure and construction projects (Wasiu *et al.*, 2014).

According to Kado (2018) the acceptance of the British Standard Institution (BSI) publication and standard by Nigeria, establishing Standard Organization of Nigeria (SON) and the development and National Building Code (2006) in 2007 are all steps towards improvement in the quality of building construction in Nigeria among many other things. In addition, there are laws, decrees, associations, authorities and regulatory bodies that are responsible for regulating building construction practices in the country. The Nigerian Society of Engineers (NSE) was established on February 6, 1958 in London, England and later inaugurated in Lagos on August 20, 1960, had its foundations laid at Abeokuta in January 18, 1959. It was however unfortunate that Nigerian engineers had to cope with a very hostile environment occasioned by the invasion of the profession with quacks and imposters of all sorts. This has resulted in very poor standard, numerous abandoned projects everywhere, structural failures, fires and outright collapses (Yusuf, 2017). The consequences of this problem led to colossal waste of human and material resources and the terribly battered image and morale of Nigerian engineers. The devastating effect of this state of affairs was slowing down the progress of this young country in hurry to develop, this attracted the attention of Government, Thus the Engineers (Registration, etc) Act (1970) was promulgated.

Unfortunately, the registration of engineers alone could not stop the continuing bastardization of engineering profession by quacks and attendant consequences

that continue to surface in the building Industry. Thus further through further hard work and representations of the Nigerian Society of Engineers the amended Act (1992) was promulgated by which the Council for registration of Engineers   in Nigeria (COREN) was now renamed the Council for the Regulation of Engineering in Nigeria with full powers to register, control, monitor and enforce compliance. It also has affiliation with the international Federation of Consulting Engineers (FIDIC). Also there is the Association of Consulting Engineers Nigeria (ACEN) which was founded and registered in 1972 and 1979 respectively, The focus of ACEN is to ensure that the highest level of technical competence and business ethics are brought to bear on the consulting engineering practice in Nigeria which will in turn result in the highest level of quality of infrastructure for Nigerians at the most cost effective prices (Kado, 2010). ACEN has strong affiliation with the National Society of Engineers (NSE) which is the umbrella association of all Engineers and individuals involved in engineering activities.

 It is noteworthy that Association of Consulting Engineers Nigeria (ACEN) has partnered with the International Federation of Consulting Engineers (FIDIC) for the provision of standards in the use of construction contracts. The FIDIC Conditions of Contracts comprise of the Conditions of Contract for Construction (Red Book), Conditions of Contract for Plant and Design-Build (Yellow Book), Conditions of Contract for EPC/Turnkey Projects (Gold Book) and Short Form of Contract (Green Book). The Red Book is the most widely used of the FIDIC books. Nigerian engineering firms and indeed the various engineering associations should consider the adoption of one or more of these international construction contracts (FIDIC, ICE, NCE) with established DRB mechanisms for the standardisation of the Nigerian engineering and construction industry, in line with international standards. Further

development which sought to regulate professional practices in the construction industry led to the founding of The Architects Regulation Council of Nigeria (ARCON) from CAP A19 Laws of the Federation of Nigeria 2004. According to the Law, ARCON derives the power to register and control practices of Architecture in Nigeria (Yunusa, 2009). ARCON has a strong affiliation with Nigerian Institute of Architects (NIA), which is equally the umbrella body of architects and individuals involved with architecture. Also there is the National Institute of Builders (NIOB) which is the umbrella association of builders and individuals involved in building activities, there is also the National Institute of Quantity Surveyors (NIQS) which is also umbrella body for individuals involved in quantity surveying activities.

2.2 Quality Management Systems in Construction Industry

Some of the recognised quality management standards include; The ISO9000 series, Total Quality Management, Quality Control, Quality Assurance, Malcolm Baldridge (MB) standard and BS 5750 of the British Standard Institute (BSI), European Construction Institute (ECI) which produced the (ECI) Matrix in 1993 (Kado, 2011).

According to the ASCE manual, (2012) the primary purpose of codes and standards is to protect the public's health and safety, compliance with codes and standards should be an issue addressed early in the design phase. Without early identification of the appropriate codes and standards, reworking plans and specifications can result in considerable cost and delay. The design professional must be knowledgeable about the

provisions of codes and standards before starting the design process because the building codes directly control the minimum standards of many components of a building project, and are responsible for much of the finished product quality. Kubal (2014) claims that regulations controlling the construction processes are much more restrictive than in most manufacturing and service industries. (Stasiowski and Burstein, 2014) underline that quality design begins with sound engineering and scientific principles which must satisfy the criteria of applicable codes and standards, but also the owner's project requirements. Codes and standards refer to the minimum criteria. Owners, however, may have particular requirements.

2.3 Concept of Cost Overrun in the Construction Industry

Cost overrun is referred to as cost increase" or "budget overrun". It involves unanticipated costs incurred in excess of the budgeted amounts (Shanmugapriya & Subramanian, 2013). Saidu & Shakantu (2016) view cost overrun as simply an occurrence, where the final or actual cost of a project surpasses the original or initial estimates. Cost overrun is defined as a percentage difference between the final completion cost and the contract-bid cost (Shanmugapriya & Subramanian, 2013; Shrestha et al., 2013; Saidu & Shakantu, 2016). Cost overrun has also been referred to as the percentage of actual or final costs above the estimated or tender cost of a project (Ubani et al., 2011:). Nega (2015) defines cost overrun as an occurrence, in which the delivery of contracted goods/services is claimed to require more financial resources than was originally agreed upon between a project sponsor and a contractor.

2.4 Factors Contributing to time and Cost Overrun

According to Mukuka et al. (2015), construction schedule overruns are not uncommon on construction projects worldwide, and the South African industry has not

escaped the challenges of failing to deliver projects on time and within budget. Raykar and Ghadge (2016) defined time overrun as the time required to complete the project work beyond the contract time. It often leads to disorder in workflow; budget overrun and contractual claims; while also reducing productivity.

Raykar and Ghadge (2016) defined cost overrun as the difference in cost between the final cost of a construction project at completion and the contract amount agreed by the owner and the contractor during the contract. In this case the changes during the cycle of a project often give rise to cost overrun due to cost increase, time schedule delays and benefit shortfalls (Raykar & Ghadge, 2016). Salunkhe and Patil (2014) mention contractors improper planning and scheduling, as well as their lack of experience, as the factors that affect the ability to make decisions, which could result in rework and financing problems. Incorrect drawings from consultants; late revision of the specifications; and less coordination with the contractor, also lead to project time overrun.

Naveenkumar & Prabhu (2016) posit that delays are incidents that impact on the projects' progress and postpone the project activities. These delay incidents may include weather delays, unavailability of resources and design delays, etc. In general, project delays occur as a result of project activities that have both external and internal cause and effect relationship. According to Raykar & Ghadge (2016), it is indicated that time and cost overrun has internal and external causes; the internal causes are caused by the employer, contractors and consultant. External causes are from the weather, labours and inflation. Singh (2010) states that any delay in the implementation of the project is a cause of cost overrun for the project. According to Mansfield *et al*. (2017), six major factors were identified that cause delays and cost overruns in Nigerian construction projects, namely: finance and payment

arrangements; poor contract management; shortages in materials; inaccurate estimation and overall price fluctuations. Mansfield *et al.* (2017) also found that design change; inadequate planning, unpredictable weather conditions and fluctuation in construction materials, are factors that influence time and cost overruns. In a study conducted by Adugna (2015) on the construction projects at Victoria Island Lagos, Nigeria the causes of time and cost overrun are financial and poor resource management (technical, human and materials).

Baloyi & Bekker (2016) state that time and cost overruns can be attributed to multiple factors for example, additional work requested by a client can result in a delay in ordering material which is subject to price increases or shortages. Ahmed *et al.* (2013) state that delays caused by the client, such as late submission of drawings and specifications, frequent change in orders and incorrect/inadequate site information, generate claims from both the main contractors, which many times entail lengthy court battles with huge financial repercussions. On the other hand, delays caused by contractors can generally be attributed to poor managerial skills and procedures not being followed, leading to errors and rework being done and delays. Lack of planning and a poor understanding of accounting and financial principles have led to many contractors' downfall.

Gaetsewe *et al.*, (2015) list the lack of technical skills and the appointment of unqualified contractors as the major causes of project time and cost overrun in the Northern Cape. There is also a lot of political interference in construction projects and that in tum, often leads to the appointment of unskilled and inexperienced contractors on projects. Such appointments lead to poor planning, enormous design changes and poor design coordination by consultants, which in tum contribute to excessive revisions of pre-set completion dates. According to Wong and Vimonsatit

(2012), the top ten causes that were identified in Western Australia are shortage of skills, financial difficulties, shortage of labour, unrealistic deadlines for project completion, unforeseen ground conditions, poor organisation of the contractor or consultant, poor communication, underestimation of completion time, low speed of decision and design errors that were made by engineers.

Kaming et al., (2018) thus note that "design changes, materials shortage and inadequate planning, were the most significant contributors to time delays on construction projects." According to Amoatey *et al*. (2014), factors such as inadequate planning and inappropriate site supervision by the contractors, inadequate project handling experience of contractors, and delay in the payments for the work completed, directly affect the completion of the project and are contributing factors to time overrun.

In a survey conducted by Manavazhia and Adhikarib (2018), it was revealed that delays in delivery of material and equipment to construction sites often contributes to time overrun in construction projects, especially in developing countries. Amandin and Kule (2016) state that delay in payments, financial deficiencies for both the contractor and the client and material procurement, are some of the major causes of public delays. Thus Kaming *et al*. (2017) note that a project may be delayed in part or whole, because of a seemingly endless list of variables. These include: inclement weather, inaccuracy of material estimates, inaccurate prediction of craftsmen's production output (especially in developing countries, where outputs are yet to be standardized), inaccurate prediction of equipment production rates, materials shortages, equipment shortages, skills shortages, locational project restrictions, inadequate planning, poor labour productivity and design changes.

Some of these variables may result in late project completion, whereas others may have no effect on construction time. However, all delays usually cost money.

Subramani *et al*. (2014) conducted a study in construction projects and their findings indicate that slow decision making, poor schedule management and increase in material or machine prices, poor contract management, poor design or delay in providing design, rework due to errors, problems in land acquisition, wrong estimation or wrong estimation methods, long periods between design and time of bidding/tendering, are the major causes of time and cost overrun. According to Sweis (2013), the three factors that cause time overrun in the construction projects of Jordan are poor qualifications of consultants, engineers and staff that have been assigned to the project; poor planning and scheduling of the project by the contractor, and severe weather conditions. According to Sambasivan and Soon (2017), ten most important causes of delay in the Nigerian construction industry were contractor's improper planning, contractors' poor site management, inadequate contractor experience, inadequate client's finance and payments for completed work, problems with subcontractors, shortage in material, labour supply, equipment availability and failure, lack of communication between parties and mistakes during the construction stages.

Baloyi & Bekker (2011) list poor estimates and material take - off and delay in payments, as the factors that contributed to cost overrun in the construction of most of the stadiums for the 2010 FIFA World Cup in South Africa. This is in line with the views by Kaming et al., (2017) who also state that according to contractors, cost overrun are mainly caused by inaccuracy of material take - off, increase in material costs and cost increase due to environmental restrictions. Linked to this, Le-Hoai et al. (2018) argue that the three top causes of cost overruns are

material costs increases due to inflation, inaccurate quantity take• off and labour cost increase due to environment restrictions.

A study in Indonesia by Kaming et al. (2017) found that the most important factors that contribute to cost overruns are material cost increases caused by inflation, inaccurate estimating of materials and degree of project complexity. According to KPMG (2013), projects are currently facing huge cost overruns due to multiple reasons ranging from delayed approvals, scope creep and shortage of project professionals, to price escalations and contractual disputes. In a study on public sector construction projects, Ameh and Osegbo (2011) state that the main causes of cost overrun are fluctuations in material, fluctuation in labour and plant costs, delay in construction and inadequate planning before the project starts.

Azis *et al*. (2012) lists poor design and delays in design; unrealistic and imposed contract duration and requirements, mistakes during construction, late delivery of materials and equipment, lack of experience, relationship between management and labour, delay preparation and approval of drawings, inadequate planning and scheduling, poor site management and supervision, as the factors leading to construction cost overrun in Nigeria. Ramabodu and Verster (2013) identified misinterpretation of the client's brief, incomplete design at tender stage, procurement strategies and contractual claims such as contract instructions, as the factors that contribute to cost overruns. In KPMG (2013), the reasons for project time and cost overrun across a project life cycle are depicted in Table 2.1.

Table 2.1: Reasons for Time and Cost Overrun across a Project Life Cycle

S/N	Stages	External and Internal Issues

1	**Pre Planning**	Delay in Regulatory Approvals
		Unavailability/Delay in availability of funds
		Land/Site Handover
2	**Planning and Design**	Lack of effective Policies
		Ineffective Procurement Policies
		Design/Scope Change
		Delay in Regulatory Approvals
		Delay in Decision Making
		Inadequate Consultant Experience
3	**Execution and Monitoring**	Weak/ineffective project planning & monitoring
		Contractual Disputes
		Unavailability/Delay in Availability of Funds
		Delay in Delivery of Material
		Poor Schedule Management
		Inadequate Contractor Experience
		Delay land/site handover
4	**Closure and Handover**	Pre-commissioning teething troubles
		Contractual Disputes
		Defects to be cleared

Source: KMPG (2013)

2.5 Impact of project time and cost overrun on Financial Performance

The construction industry is a key sector in the development and economic growth of Nigeria. However, the industry has been facing difficulties in terms of delivering construction projects within the approved time and cost. Any delays experienced by

projects in the energy industry do not only affect the organisation, but also the end user, this also slows down the economy's growth rate.

For Mukuka *et al*., (2015), the effects of schedule overruns are the consequences that will occur when the causes of schedule overruns are not identified and worked on effectively. Singh (2010) is of the view that delays and cost overruns have major implications, both economically and politically, and due to these delays in project implementation, people have to wait longer than necessary for the provision of public goods and services. The services that are provided by infrastructure projects lead to an increase in the capital output ratio for the entire economy. According to Mahomed (2015) construction delays can be referred to as a prolonged construction period beyond that which was estimated previously. These delays have been proven to be a potential source of risks in the construction industry. These various risks that are associated with projects delays are cost related where delay will generally lead to an overall increase in the cost of the project.

According to Kangari (2018), construction projects are mostly financed through borrowing and the increase in the project cost leads to the financial distress of many stakeholders such as the client, the financial institution and the construction company, which in the end threatens the financial sustainability of these stakeholders. Financial sustainability is defined as the likelihood that market participants can secure financial stability by minimizing external influence.

According to Mahomed (2015), when time overrun occurs, the project completion time will be extended beyond the date which was estimated. This leads to dissatisfaction by the owner or the clients. Lee (2018) believes that cost overruns are due to inefficient budgets and the national government's poor use of investments in

state owned companies, all of which have a negative effect on the economy of the country. Amandin and Kule (2016) believe that the trend of cost overrun in construction projects has worsened over the years and has resulted in negative consequences such as project failure, reduction of profit margin and poor citizen trust in government funded projects. Kaliba *et al.* (2019) state that if project costs or schedules exceed their planned targets, client satisfaction would be compromised; the funding profile would no longer match the budget requirement thereby resulting in further setbacks in the schedule. Sunjka and Jacob (2013) state that disputes due to schedule overruns can lead to court cases for resolution, especially when large penalties are involved. According to Gilchrist and Allouche (2005), time delays have a direct impact on sustainability and on existing infrastructure system.

Salunkhe and Patil (2014) observed that 57% of construction projects in India experience time overrun and this always led to increased expenditure for all parties. Another observation is the recurring problem of construction delays, which has a negative effect on project success in terms of time, cost and quality. On that basis, when a construction delay occurs, there is no question that the owner suffers financially" (Divya and Ramya, 2015). In a study conducted by Sambasivan and Soon (2017) in Nigeria, 17.3% of government projects were delayed for more than three months or abandoned in the year 2015. This had a negative impact on the GDP growth of Nigeria, as the construction sector contributes to 3.3% of the GDP. According to IMFG (2015), the outcomes of time and cost overrun include government budget deficits and a loss of public confidence that the government cannot meet its commitments.

It is therefore argued that when the project costs exceed the approved amount, technical default on debt financing is likely triggered. Equity sources may be required

to provide more funding, other unfavourable debt arrangements may have to be made; and vendors' payment may be missed (RPMGLOBAL, 2015). According to Gilchrist and Allouche (2005), time delays have a direct impact on sustainability since an increase in project delivery time is associated with traffic congestion, delays, disruption of economic activities, increased pollution, damage to ecosystems and an impact on existing infrastructure. This delay is not good for any economy as it has a negative impact not only on the economy, but on the environment as well.

Abhedi (2011) states that any delays in a project are costly and will often result in disputes and claims. It results in loss of productivity; late completion of the project; third party claims and ultimately the abandoning of a project and termination of contracts. Haseeb *et al.* (2011) believe that the consequences of project delays are different for various parties. The general consequences are the loss of wealth, time and capacity. To the owner, delay means the loss of income and the unavailability of facilities, while to the contractor, delay means the loss of money for extra spending on equipment, materials, hiring of labour and loss of time. According to Eskom (2015), it is losing millions and millions of rands due to projects that are not completed on time and within budget. This also prevents the business from embarking on new projects. The time and cost overrun on projects has a negative impact on all the parties including the client. This has also resulted in its delay in repaying the loans used to fund projects while also giving it a bad reputation, for not delivering on time. In a study done by KPMG (2013), top management cited poor forecasting, poor risk identification and cost escalation as the three top reasons for reduced profit margins. This poses a financial risk to the client and the contractors, in addition to the impact exerted on the sustainability of the project. Sunjka and Jacob (2013) state that time and cost overrun in

projects are costly and risky, while at the same time they have unwanted consequences on the success of a project in terms of time, quality and safety.

The impact of such consequences are not only limited to the construction industry, but they influence the overall economy of the country. Polat *et al.* (2014) believe that cost overruns negatively affect construction companies, especially if the company is micro-scaled, as it can lead to bankruptcy of a company, due to the company having limited capital and being more vulnerable to risks. According to Nega (2008), the effects of cost overrun are not confined to the construction industry, but are reflected in the state of the overall economy of a country. Time and cost overrun in construction projects prevent the planned increase in property and service production and this problem in turn negatively affects the rate of national growth. Project cost overrun can cause a slower pay out and reduces an early return on the client's or project owner's investment. This can result in the decrease of the client's project annual return on investment. Haseeb *et al.* (2011) state that in Pakistan, the country's economy was affected due to the time and cost overrun of large construction projects, as these large projects contribute to the development and progress of the country. There was loss of investment on the projects hence the country's economy was affected because the development and progress of the economy in Pakistan is dependent on these large construction projects. Haseeb *et al.* (2011) identified the effects of time and cost overrun in Pakistan construction industry as clash, claims, total desertion and slowing down the growth of the construction sector. According to Mbachu and Nkado (2014), cost overruns have effects for the key stakeholders in particular, and on the construction industry in general. To clients, cost overrun implies added costs over and above the initial costs of the project, which results in less returns on investment. To the end user, the added costs are passed on as higher rental/lease costs. In the eyes

of professionals, cost overrun implies the inability to deliver value for money and could well tarnish their reputations thus resulting in loss of confidence rested in them by the clients. To the contractor, it implies loss of profit for non-completion and defamation, which could threaten the chances of him/her getting further jobs if he/she is at fault.

To the construction industry, cost overruns could secure financing for the project but at higher costs due to added risks. Eshofonie (2018) identified four effects of cost overruns as company liability to insolvency and liability of the companies or firms to bad debt; under utilization of manpower resources, plants and equipment; increased project cost due to extension of time; implying longer project duration and the fact that more resources will need to be allocated to the project and hence, an increase in the project costs.

2.6 Mitigation Measure Cost Overrun in Construction Projects

Gutae (2015) posits that planning is the most essential component of project management and the biggest weapon against cost overruns and delays". According to Sambasivan and Soon (2017), planning and scheduling are very important in order to perform the project tasks on time, provide updates and to prevent delay. Effective communication among project stakeholders is also very crucial for project success. Once a project has been initiated, a planning meeting will take place with all the stakeholders that are involved in the project. This is one of the requirements that are prescribed in the Project Control Manual at Eskom. The individuals that are involved in the project are introduced in relation to the scope of work to be carried out and the milestones of the project at this meeting. They will also agree on the start and completion dates of the milestones e.g. the design completion date and the construction

start and end date. The constructability of the project is also discussed at this meeting and any risks that maybe encountered during construction are also raised.

Sambasivan and Soon (2017) believe that the problems with subcontractors can be minimized by carrying out an in-depth selection process of qualified subcontractors who consider not only cost, but also quality, safety and environmental aspects of the project. Enshassi *et al.* (2010) recommend that contactors be selected according to their previous experience, reputation and capabilities, in terms of labour, equipment and machinery. Subcontractors must be involved in the initial stages of the project through a balanced flow of information between them and the main contractor. The main contractor is currently responsible for the sub-contractors at Eskom. In declaring that they will be subcontracting, main contractors will complete an Eskom subcontractor declaration form. The form will also be signed by an Eskom Project Manager where the intentions of the main contractor to subcontract are acknowledged. The subcontractor will be managed by the main contractor that is appointed by Eskom. The subcontractor will report to the main contractor regarding the progress of the project as all tasks and work will be issued by the former.

Raykar and Ghadge (2016) believe that the approval of the tender should not be determined by the lowest bids, but should also consider the experience, effectiveness and technical knowledge of the contractor and the availability of enough resources to complete the project on time, as wrong selections may lead to a number of problems during construction. A study by Huang (2011) shows that the cheapest tenderers often have difficulties with completing the project on time and within budget.

Accepting the lowest cost is a warning sign of problems in the completion of a project because very often, lowering the price means lowering the quality. According to Mulla and Waghmare (2015), proper contract management is key to minimizing time and cost over-runs. The contract planning has to be closely linked to resource-based implementation planning of the projects. Contractors and suppliers should integrate their resources and timetable with project plans and must abide by them. Each contract's dates should be as per the work plan. There should be close follow-up and interaction. Existing penalties and incentives need to be considerably enhanced so that contractors are also committed to timely performance. Some of these include simple practices like ensuring that the time and cost implication of any design change are fully evaluated before being sanctioned.

The quantity surveyor is responsible for managing all the costs relating to the project, which also involves overseeing the initial calculations to the final figures. Their role is to equally minimise the costs and maximise the quality of the project. The quantity surveyor will prepare the estimates and costs of the work to be done using the design together with the bill of quantities that has been provided by the engineer. During the progress of the project he/she will keep track of any deviations from the contract as these may result in an increase in costs; if there are any deviations that have resulted in the increase in costs, he/she will notify the engineer and the project manager. Changes to the engineering and construction project can be expected when the processes commence, but the additional cost and delay in the scheduled dates must be understood by those requesting the change. Subsequently the consequences of a design change do not only involve the work package for which the change is requested, but other work packages and overhead functions of the project

as well. The proper change control processes must be followed before a change in design is carried out.

Material management is the management system for coordinating and controlling all necessary efforts in ensuring that the correct quality and quantity of materials are properly specified in a timely manner, are obtained at a reasonable cost and are available at the point of use when required. To deal with the material issues effectively, it is highly recommended that a management group be formed specifically for logistical planning and that an appropriate management buyout system is also formed (Raykar & Ghadge, 2016)

Some of the existing procurement practices in a project also contribute to cost and time overrun of projects. Construction projects has national contracts that are used by all the different operating units. The unit is required to acquire the services or products of a contractor or supplier as part of the national contract. This practice restricts the unit from independently choosing their preferred contractor or supplier depending on their needs. The main challenge arises when the supplier that is contracted to supply certain material is unable to deliver on time or there is a shortage in stock, therefore the Operating Unit cannot source the material from another supplier. An effective materials management system has the ability to incorporate the entire material and supply chain work processes. Project teams will have online access to information during all project phases, from engineering through to the complete supply chain to onsite management. The business benefits of effective materials management include significant cost savings and increased procurement efficiency. The efficient use and management of material have an important influence on a company's profit and can delay project construction if it is not properly managed. It is important to have material systems in place that will assist in

ensuring that materials are delivered on time, stock levels are well managed and the construction scheduled is not compromised.

System Analysis Programme (SAP) software is currently used to order material for projects. The program gives the requester an indication of the quantity available and which warehouse and respective operating unit it can be found. SAP is also enabled to generate livestock materials to trigger the ordering of materials whenever more materials are needed. The internal control in relation to materials management is done through completing a despatch request form which must be signed for every material issued.

Having a risk register in place for the project at an early stage is very important (e.g. from the tender stage) to ensure proper identification, allocation and management of risks. It is also important in assigning cost and/or time implications to all identified risks on the risk register whenever possible, to ensure that it is open to all relevant members of the project team (Olawale and Sun, 2010). According to Gutae (2015), improper scheduling can cause wrong cost estimation and increase the idle times of some of the team members, thus the use of good scheduling tools or more advanced project scheduling tools can help the project team with scheduling.

Assaf *et al*. (2015) provides suggestions on how owners, contractors and consultants can minimize delays in the construction of projects. They note that owners must pay progress payments to the contractor on time, as late payment impairs the contractor's ability to finance the work; they must minimize change orders during construction; avoid delays in revising and approving of design; submit the design documents on time; and it is important that the owner checks for resources and capabilities before awarding the contract to the lowest bidder. Progress meeting with the

contractor and consultant are very vital in order to reduce delays. The contractors must ensure that they have labourers that are adequately skilled and motivated to perform the job they have been assigned to. There must also be communication amongst the team. The financial resources and cash flow of a contractor must be properly managed in order to avoid any disruptions to the project. The consultant must ensure that the designs are reviewed and approved timeously. The consultant must also be able to evaluate the work done by the contractor to ensure the project is done as per the design and is of high quality.

According to Okeyo *et al*. (2015), timely payments of contractors is likely to prevent cost and time overruns in Kenya, as these may have a significant effect, especially in low-income economies such as Southern African countries. The payment of contractors should be planned properly by initiating appropriate mitigating measures against potential risks, such as delayed disbursement of funds by external financiers; delayed approval of contractors' payment requests; political interference; as well as financial misappropriation by employers, among others. Any delays to the payment must also be communicated with the reasons to the contractor.

Azis *et al*. (2012) believe that frequent progress meetings will improve the performance and resolve the uncertainties faced during execution, thus arguing that it is best to arrange regular progress meetings to discuss project related issues in detail and re-plan if necessary. However, the meetings must not be too frequent because it will lead to time wasting. Senior officials and managers who are authorised to make decisions must be part of the meetings. Every organization must have a policy to document the progress of work, which can be properly assessed by arranging regular meetings. According to Alinaitwe *et al*. (2013), stakeholders in the construction industry are advised to minimise changes in work scopes, as this has the greatest

impact on cost and time overruns. It is recommended that project management be improved, with more emphasis on collaborative relationships. This will essentially reduce payment delays by improving cash flow on the part of the client thus reducing overall project costs. Azis *et al*. (2012) posit that it is very important to share past experiences from other similar projects including challenges experienced and solutions in order to improve project performance from the planning stage to the handover of the project. In these same processes, experiences on positive milestones and achievements and how these were achieved should be shared. This can be used as learning curves on the current project. All projects, once completed, must be analysed in detail, especially the projects that incurred extra costs. This must be performed by the team in order to identify the reasons for its failure. This process is known as post-mortem and it is a very effective and pertinent step in reaching organizations' goals. This should be done as part of the closing process and it is the responsibility of the Project Manager to document the results. This will certainly help prevent any cost overruns in future projects.

2.7 Review of Related Empirical Studies

Mahamid and Dmaidi (2013) conducted a field survey of 26 consultants on risks leading to cost overrun in building construction from consultants' perspective. The study classified 41 factors identified through literature review into five groups. Ranking of responses indicated that the top five factors were: political situation, fluctuation of prices of materials, economic instability, currency exchange, and level of competitors. Memon, Abdul Rahman and Abdul Azis (2012) used questionnaire survey to study the causes of cost overrun of large projects in Southern Part of Peninsular Nigeria. Ranking of results indicated that fluctuation in material prices, cash flow and financial difficulties faced by contractors, delay in progress payment by owners and frequent

design changes are the dominant factors causing cost overrun. Spearman correlation test revealed correlation value $\rho = 0.787$ between slow information flow and lack of communication.

Aljohani *et al*. (2017) conducted a study on construction projects cost overruns to identify their main causes. The study classified 366 causes of cost overruns identified from the review of literature into internal and external factors, which were further categorised into 8 factors. The study showed that although the most identified causes of cost overruns from most studies are poor project management related, causes of cost overruns differ from country to country and that the identification of causes for a specific country from only the global literature is inaccurate.

Isma'il *et al.* (2013) identified thirty-eight cost overruns causes that affect the cost of road construction in Nigeria from the literature and ranked them according to responses in order of priority. The finding revealed the four top most influencing factors as increase in global demand for construction materials, out-dated estimates, traffic control planning and corruption.

Pinto (2013) charged that project cost overruns are caused by frequent deliberate and systematic mistakes, including: errors of optimism bias, artificial plan manipulation, poor change control, and inadequate or superficial risk management. However, Rosenfeld (2014) identified 146 potential causes of cost overruns, which were categorized into 15 independent universal root causes. Ranking by 200 professionals revealed that the causes of cost overruns were premature tender documents, too many changes in owners' requirements or definitions and tender-winning prices being unrealistically low (suicide tendering).

Al-Hazim and Abu Salem (2015) studied delay and cost overrun in road construction projects in Jordan by analysing project documents and final reports of projects executed from 2000 to 2008. The study found that terrain conditions, weather conditions and variations were the significant causes of time and cost overruns. Mustefa (2015) also did the analysis of factors affecting time and cost overrun in road construction in Addis Ababa. The study involved reviewing contract documents and questionnaire survey of clients, contractors and consultants. The result of the analysis revealed that design change, fluctuation in material costs and inadequate review of drawings and contract documents were the most common causes of cost overruns.

Using questionnaire survey of 50 respondents, Rajakumar (2016) did an analysis of cost overrun in road construction activities in India. The study requested the respondents to rank 30 identified causes of cost overruns on a scale of 0 to 3, which were analysed using relative importance index (RII). The critical factors contributing to cost overruns included land related issues, inflation, delay in payment, force majeure, design changes, etc.

Ahady *et al.* (2017) did a critical review of the causes of cost overruns in construction industries in developing countries. The research identified the causes of cost overruns from different studies conducted on 10 countries and revealed that many factors cause construction projects to overrun cost. The study also found that although the causes are different for every project, most of the causes in development countries are similar. Fluctuations and increases in material price were found as the most important causes of cost overruns.

2.8 Summary of Literature Review

The study highlighted cost overrun on quality management in the construction industry. Quality management means making sure things are done according to the plans, specifications, and permit requirements. It also highlighted on the causes of cost overrun, the major causes of cost overrun are ranging from delayed approvals, scope creep and shortage of project professionals, to price escalations and contractual disputes. The study also highlighted some empirical reviews that support the study. The gap the study intends to fill is to established strategies to mitigate the effect of cost overrun in the building construction industry.

CHAPTER THREE

3.0. **RESEARCH METHODOLOGY**

3.1 Research Design

A descriptive survey research was adopted for the study. This is because it involves the use of structured questionnaire developed from the review of related literature to determine the opinion and perception of respondents. Descriptive survey design according to Uzoagulu (2011) is a research design which involve gathering of information about a large number of people or objects by studying a representative sample of the entire group through the use of questionnaires. The design aid the

researcher to collect the data from the target population on the assessment of cost overruns as correlate of quality control in building project in Aboh Mbiase Local Government Area, Imo State.

3.2 Population of the Study

The targeted population for this study 118 respondents comprised of 38 project managers 50 contractors and 30 Quantity Surveyors.

3.3 Sample and Sampling Techniques

The sample size for the study comprises of 118 respondent, that is the entire population of the Study, there was no sampling due to the manageable size of the population.

3.4 Instrument for Data Collection

The Instrument used for data collection is a structured questionnaire titled: Questionnaire for Assessment of Cost Overruns as Correlate of Quality Control In Building Project (QACOBP). "The questionnaire is divided into two parts, part one contains the personal data of the respondent, while part two is made up of four Sections (I-IV).

All section of the research question was structured on four points likert rating Scale, so that respondents express their opinion by ticking the appropriate option that best described his opinion.

3.6 Validation of the Instrument

To ensure the validity of the instruments the QACOBP was subjected to face and content validation by three experts. Two from Industrial and Technology Education Department, Federal University of Technology Minna. Their suggestions and corrections for improvement of the language level technical terms and content of the instruments were used to refine the items before the final copies were produced.

3.7 Reliability of the Instrument

A trial test was conducted with two construction companies in another Local Government to determine the reliability coefficient of the instrument using split-half reliability methods on a randomly sample size of fifteen (15) instrument in each of the construction site.

3.8 Administration of the Instrument

The QACOBP was administered to the respondents by the researcher with the help of two research assistants. The research assistants was trained by the researcher on how to administer the instrument to the respondents. The researcher seek will permission from the management, upon the approval of the permission the researcher distributed the questionnaire to the respondents. The questionnaires was collected immediately from those respondents that answered it at a spot. While others was given two weeks to enable them have time to respond. The respondents were requested not to indicate their names and information regarding the nature and purpose of the study and instruction on how to complete the questionnaires were provided. The researcher collected the answered questionnaire and the percentage rate of the returned questionnaire were determined and arranged for data analysis base on each research question.

3.9 Method of Data Analysis

The data collected was organized in line with the research question and hypothesis formulated for the study. Statistical Package for the Social Sciences (SPSS Version 23) was used for the analysis. Mean and standard deviation was used to answer the research questions, while z-test statistics was used to test the null hypothesis. The decision for each question is based on resultant means score interpreted related to the concept of the real lower and upper limit of number 1-5 as shown above. The null hypothesis was tested using z-test Statistics at 0.05 level of significance. The decision on the null

hypothesis formulated for the study was based on comparing the significant value with p-value of 0.05 level of significant, that is where the significant value is less than (P < 0.05) it was rejected while equal or greater than (P≥ 0.05) level of significant, the hypothesis was accepted.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Result

Research Question One

what are the causes of cost overrun in building project ?

Table 4.1:

Mean responses of the respondent on the causes of cost overrun in building project

N = 118

S/N	ITEMS	$\overline{X}_A$	SD	Remarks
1	Design changes	2.62	0.59	Agreed
2	Inflation	3.13	0.39	Agreed

3	Fluctuation of prices	2.82	0.55	Agreed
4	Variations	2.63	0.49	Agreed
5	Monthly payment difficulty	2.50	0.54	Agreed
6	Lowest bidder policy	2.65	0.48	Agreed
7	Exchange rate	2.56	0.53	Agreed
8	Inaccurate cost estimates	3.26	0.59	Agreed
9	Delay in progress payment	2.89	0.49	Agreed
10	High interest rate on loans	2.79	0.54	Agreed
11	Government related issues like changes in policies, pressures etc.	2.75	0.74	Agreed
12	Corruption	3.14	0.40	Agreed
13	Escalation of material prices	2.82	0.50	Agreed
14	Economic instability	2.92	0.32	Agreed
15	Government taking too many projects at a time	2.74	0.51	Agreed

Key

N$\quad$ = Number of professionals

SD_A = Standard deviation of professionals

$\overline{X}_A$ = Mean Average of professionals

The result presented in Table 4.1 above revealed that all the items agreed with the mean average 2.50-3.26 on the causes of cost overrun in building project based on decision rule.

4.2 Research Question Two

what are the impact of cost overrun in building project ?

Table 4.2

Mean responses of the respondent on the impact of cost overrun in building project

N= 118

S/N	ITEMS	$\overline{X}_A$	SD	Remarks
1	It results in loss of productivity	3.33	0.65	Agreed
2	late completion of the project	2.92	0.67	Agreed
3	third party claims on the project	2.67	0.89	Agreed
4	ultimately the abandoning of a project	2.83	0.72	Agreed
5	termination of contracts	2.83	0.72	Agreed
6	loss of income	2.92	0.67	Agreed
7	unavailability of facilities	2.92	0.67	5Agreed
8	extra spending on equipment and materials,	2.50	0.67	Agreed
9	loss of time	2.67	0.89	Agreed
10	Extra Spending on hiring of labour	2.83	0.94	Agreed

Key

N   = Number of professionals
SD_A = Standard deviation of professionals
$\overline{X}_A$ = Mean Average of professionals

The result presented in Table 4.2 revealed that all the respondent agreed with the mean

average from 2.50-3.33 on the impact of cost overrun in building project. The result

indicated that there is high impact of cost overrun in building project

4.3 Research Question three

what are the mitigating measures for cost overruns in building projects?

Table 4.3

Mean responses of respondents on the mitigating measures for cost overruns in building

projects.

N = 118

S/N	ITEMS	$\overline{X}_A$	SD	Remarks
1	planning and scheduling	3.33	0.65	Agreed
2	perform the project tasks on time	2.92	0.67	Agreed
3	provide updates and to prevent delay	2.67	0.89	Agreed
4	Effective communication among project	2.83	0.72	Agreed

	stakeholders			
5	an in-depth selection process of qualified subcontractors	2.83	0.72	Agreed
6	the availability of enough resources to complete the project on time	2.92	0.67	Agreed
7	proper contract management	2.92	0.67	5Agreed
8	resource-based implementation planning of the project	2.50	0.67	Agreed
9	Contractors and suppliers should integrate their resources and timetable with project plans	2.67	0.89	Agreed
10	ensuring that the time and cost implication of any design change are fully evaluated before being sanctioned	2.83	0.94	Agreed

Key

N   = Number of professionals

SD_A = Standard deviation of professionals

$\overline{X}_A$ = Mean Average of professionals

4.4 Hypothesis One

There will be no significant difference among the responses of contractors, project managers and quantity surveyors on the causes of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State

Table 4.4: Analysis of Variance on the causes of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.869	2	.434	63.963	.000

	Sum of Squares	df	Mean Square
Within Groups	.509	75	.007
Total	1.378	77	

The Table 4.4 shows the One-way between group's Analysis of Variances that was conducted for the mean responses of professionals on the causes of cost overrun in building project. The result of the analysis showed an f- ratio of 63.963 and a significant criterion (sig) of 0.000 which is less than p-value of 0.05. Therefore the null hypothesis was rejected. This suggest that there was no significant difference among the responses of contractors, project managers and quantity surveyors on the causes of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State.

4.5 Hypothesis Two

There will be no significant difference among the responses of contractors, project managers and quantity surveyors on the impact of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State.

Table 4.5: Analysis of Variance on the impact of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.291	2	.145	12.399	.000
Within Groups	.880	75	.012		
Total	1.171	77			

The Table 4.5 shows the One-way between group's Analysis of Variances that was conducted for the mean responses on the impact of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State. The result of the analysis showed an f- ratio of 12.399 and a significant criterion (sig) of 0.00 which is less than p-value of 0.05. Therefore the null hypothesis was rejected. Hence, there was a significant

difference among the responses of contractors, project managers and quantity surveyors on the impact of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State.

4.6 Hypothesis Three

There is no significance difference between the response of contractors, project managers and quantity surveyors on the mitigation measures for cost overruns in building projects in Aboh Mbiase Local Government Area, Imo State.

Table 4.6: Analysis of Variance on the mitigation measures for cost overruns in building projects in Aboh Mbiase Local Government Area, Imo State.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.590	2	.295	28.823	.000
Within Groups	.768	75	.010		
Total	1.357	77			

The table 4.6 shows the One-way between group's Analysis of Variances that was conducted for the mean responses on the mitigation measures for cost overruns in building projects in Aboh Mbiase Local Government Area, Imo State. The result of the analysis showed an f- ratio of 28.823 and a significant criterion (sig) of 0.00 which is less than p-value of 0.05. Therefore the null hypothesis was rejected. Hence, there was a significant difference between the response of contractors, project managers and quantity surveyors on the mitigation measures for cost overruns in building projects in Aboh Mbiase Local Government Area, Imo State.

4.3 Summary of Major Findings

1. The respondents agreed on the causes of cost overrun in building project.

2. There is high impact of cost overrun in building project

3. The respondents agreed on the mitigating measures for cost overruns in building projects

4. There was a significant difference among the responses of contractors, project managers and quantity surveyors on the causes of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State.

5. There was significant difference among the responses of contractors, project managers and quantity surveyors on the impact of cost overrun in building project in Aboh Mbiase Local Government Area, Imo State.

6. There was a significant difference between the response of contractors, project managers and quantity surveyors on the mitigation measures for cost overruns in building projects in Aboh Mbiase Local Government Area, Imo State.

4.4 Discussion of Results

The findings on research question one revealed that the respondents agreed on the causes of cost overrun in building project. The findings corroborate with Gaetsewe *et al.*, (2015) list the lack of technical skills and the appointment of unqualified contractors as the major causes of project time and cost overrun in the Northern Cape. There is also a lot of political interference in construction projects and that in tum, often leads to the appointment of unskilled and inexperienced contractors on projects. Such appointments lead to poor planning, enormous design changes and poor design coordination by consultants, which in tum contribute to excessive revisions of pre-set completion dates. According to Wong and Vimonsatit (2012), the top ten causes that were identified in Western Australia are shortage of skills, financial difficulties,

shortage of labour, unrealistic deadlines for project completion, unforeseen ground conditions, poor organisation of the contractor or consultant, poor communication, underestimation of completion time, low speed of decision and design errors that were made by engineers

Findings on research question two revealed that there is high impact of cost overrun in building project. The findings corroborate with Al-Hazim and Abu Salem (2015) studied delay and cost overrun in road construction projects in Jordan by analysing project documents and final reports of projects executed from 2000 to 2008. The study found that terrain conditions, weather conditions and variations were the significant causes of time and cost overruns. Mustefa (2015) also did the analysis of factors affecting time and cost overrun in road construction in Addis Ababa. The study involved reviewing contract documents and questionnaire survey of clients, contractors and consultants. The result of the analysis revealed that design change, fluctuation in material costs and inadequate review of drawings and contract documents were the most common causes of cost overruns.

Findings on research question three revealed that the respondents agreed on the mitigating measures for cost overruns in building projects. The findings agree with Azis *et al.* (2012) believe that frequent progress meetings will improve the performance and resolve the uncertainties faced during execution, thus arguing that it is best to arrange regular progress meetings to discuss project related issues in detail and re-plan if necessary. However, the meetings must not be too frequent because it will lead to time wasting. Senior officials and managers who are authorised to make decisions must be part of the meetings. Every organization must have a policy to document the progress of work, which can be properly assessed by arranging regular meetings. According to Alinaitwe *et al.* (2013), stakeholders in the construction industry are

advised to minimise changes in work scopes, as this has the greatest impact on cost and time overruns. It is recommended that project management be improved, with more emphasis on collaborative relationships.

CHAPTER FIVE

5.0   CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

The study assessed the effect of cost overruns as correlate of quality control in building project in South-East, Nigeria. Three objectives were formulated the study, three research questions were raised to guide the study, three hypotheses were formulated at 0.05 level of significance. The research design that was used in carrying out this study is a survey research design. The targeted population for this study 118 respondents comprised of 38 project managers 50 contractors and 30 Quantity Surveyors. The sample size for the study comprises of 118 respondent, that is the entire population of the Study, there was no sampling due to the manageable size of the population. The data collected was organized in line with the research question and hypothesis formulated for the study. Statistical Package for the Social Sciences (SPSS Version 23) was used for the analysis. Mean and standard deviation was used to answer the research questions, while z-test statistics was used to test the null hypothesis. The findings of the result revealed that all the items agreed with the mean average 2.50-3.26 on the causes of cost overrun in building project based on decision rule. The findings also revealed that all the respondent agreed with the mean average from 2.50-3.33 on the impact of cost overrun in building project. The study found that there is high impact of cost overrun in building project. Furthermore the study shows that the respondents agreed on the mitigating measures for cost overruns in building projects.

5.2 Implication of the Study

The study implies that frequent progress meetings will improve the performance and resolve the uncertainties faced during execution, thus arguing that it is best to arrange regular progress meetings to discuss project related issues in detail and re-plan if necessary. However, the meetings must not be too frequent because it will lead to time wasting.

5.3 Contribution to Knowledge

The study contribute to knowledge by establishing fact on the causes of cost overrun in building project. It also establishes fact on the impact of cost overrun on the quality of building project and the measures for mitigating cost overruns in building projects.

5.4 Conclusion

The study assess the effect of cost overruns as correlate of quality control in building project in Aboh Mbiase Local Government Area, Imo State. Three objectives were formulated to guide the study, three research questions were raised to guide the study and three hypotheses were formulated to guide the study at 0.05 level of significance. The study revealed that the respondents agreed on the causes of cost overrun in building project. The study found that there is high impact of cost overrun in building project. Furthermore the study shows that the respondents agreed on the mitigating measures for cost overruns in building projects.

5.5 Recommendations

The following recommendations were made based on the findings of the study

1. The professionals in building industry should be conscious of time delays which have a direct impact on sustainability and on existing infrastructure system

2. The professionals in the construction should plan very well which is the most essential component of project management and the biggest weapon against cost overruns and delays

3. The construction companies should carried out an in-depth selection process of qualified subcontractors who consider not only cost, but also quality, safety and environmental aspects of the project.

5.6 Suggestion on Further Studies

1. An evaluation of the budgetary reliability of bills of quantities in building procurement in Niger State

2. Causes and effects of construction delays on completion cost of housing projects in North Central

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REQUEST FOR VALIDATION OF RESEARCH INSTRUMENT

Dear Sir,

I am a student of Federal University of Technology, Minna in the Department of Industrial and Technology Education. I am currently carrying out a study titled:

ASSESSMENT OF COST OVERRUNS AS CORRELATE OF QUALITY CONTROL IN BUILDING PROJECT IN ABOH MBIASE LOCAL GOVERNMENT AREA, IMO STATE

I therefore request that you validate the attached instruments (questionnaire). Please check the questionnaire against the specific research question to ascertain their conformity, meaningfulness and logical sequence based on the content covered. I also request that you check the suitability and clarity of the questionnaire with a view of identifying relevant information(s) vital to the study but not reflected. Kindly remove all ambiguous or irrelevant statements so that instrument will be easily understood.

Thanks.

Validated by:

Name: _____

Sign: _____

Date: _____

QUESTIONNAIRE FOR ASSESSMENT OF COST OVERRUNS AS CORRELATE OF QUALITY CONTROL IN BUILDING PROJECT IN ABOH MBIASE LOCAL GOVERNMENT AREA, IMO STATE

Dear respondent, This Questionnaire is designed to obtain information on the assessment of cost overruns as correlate of quality control in building project in Aboh Mbiase Local Government Area, Imo State.. Please, kindly assist by filling the necessary information where appropriate. Any information obtained will be held in strict confidence and will be used solely for the purpose of this academic study.

SECTION A

Personal Data

Gender:

Male [ ]   Female [ ]

Profession

Project Manager   [ ]   Contrator [ ]   Quantity Surveyor [ ]

SECTION B

Instruction: Reach item by ticking the options (SA, A, D, SD) that best describes your

describes your acceptance as a cause of cost overrun in building project.

The following value are assigned to the rating scale

SA= 4, A = 3, D=2, SD = 1

RESEARCH QUESTION ONE

1. what are the causes of cost overrun in building project ?

S/N	ITEMS	SA	A	D	SD
1	Design changes				
2	Inflation				
3	Fluctuation of prices				
4	Variations				
5	Monthly payment difficulty				
6	Lowest bidder policy				
7	Exchange rate				
8	Inaccurate cost estimates				
9	Delay in progress payment				
10	High interest rate on loans				

11	Government related issues like changes in policies, pressures etc.				
12	Corruption				
13	Escalation of material prices				
14	Economic instability				
15	Government taking too many projects at a time				

RESEARCH QUESTION TWO

what are the impact of cost overrun in building project ?

S/N	ITEMS	SA	A	D	SD
1	It results in loss of productivity				
2	late completion of the project				
3	third party claims on the project				
4	ultimately the abandoning of a project				
5	termination of contracts				
6	loss of income				
7	unavailability of facilities				
8	extra spending on equipment and materials,				
9	loss of time				
10	Extra Spending on hiring of labour				

RESEARCH QUESTION THREE

what are the mitigating measures for cost overruns in building projects

S/N	ITEMS	SA	A	D	SD
1	planning and scheduling				
2	perform the project tasks on time				
3	provide updates and to prevent delay				
4	Effective communication among project stakeholders				
5	an in-depth selection process of qualified subcontractors				
6	the availability of enough resources to complete the project on time				
7	proper contract management				
8	resource-based implementation planning of the project				
9	Contractors and suppliers should integrate their resources and timetable with project plans				
10	ensuring that the time and cost implication of any design change are fully evaluated before being sanctioned				