IMPACT OF INEFFECTIVE COMMUNICATION ON THE DELIVERY OF CONSTRUCTION PROJECTS IN ABUJA, NIGERIA

ABSTRACT

One of the significant difficulties of a construction project is poor communication and project failure is directly connected to it as it is considered as one the principle challenges in the Construction Industry. All the various stages of construction rely on professionals transferring appropriate and relevant information to develop a buildable design that meets the client's requirements. Information in the form of drawings, specifications and construction methods must be communicated from one expert to another. Therefore, using an appropriate communication method and communication medium to resolve construction and design problems is essential. This research however assessed the impact of ineffective communication on the delivery of construction projects in Abuja, with a view to proposing strategies for improving communication. Quantitative research method with the use of questionnaire was adopted for the study. Information needed was supplied by quantity surveyors, builders, engineers and architects working with construction firms in Abuja handling various projects and which are registered with the Federation of Construction Industry (FOCI). There are presently 25 registered construction firms of which 3 questionnaires were administered to each of these 25 firms making a total of 75 and a total of 40 were retrieved giving a total of 53.33% response rate which was deemed adequate for the conduct of the research, however more would have been retrieved but for the effect of the pandemic lockdown. Analysis of data was carried out using Mean Item Score (MIS) and Relative Importance Index (RII). Results of the study revealed that the most effective channels of communication used by professionals range from Face to face/Oral conversations (RII = 0.95) to Maintenance Training (RII = 0.83). The most important cause of poor communication on construction projects range from Poor feedback (RII = 0.89) to Lack of training (RII = 0.82). The influence of poor communication on the cost (MIS = 3.80-4.55), time (MIS = 3.83-4.50) and quality (MIS = 3.53-4.25) delivery of construction projects is significant. The identified strategies for improving communication in construction projects are effective. It was concluded that ineffective communication has negative impact on project delivery. Therefore effective communication should be carried out all through the life cycle of the construction process which will lead to a positive outcome of the objectives of the project and the importance of these will further improve on: contractual relationship skill, payment and award skill, planning, scheduling of project delivery within budgeted time and cost, productivity of construction materials and machine, health and safety communication and records.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

The Construction Industry assumes a significant part towards the social and financial improvement of nations around the world (Abdulateef *et. al.*, 2017). Nonetheless, it is loaded with intricacies and difficulties. Individuals from various societies and professions team up in various ways to arrive at the fundamental objective of a project successful outcome (Yaser & Abdulrahman, 2018). One of the significant difficulties of a construction project is poorcommunication and project failure is straightforwardly connected to it as it is considered as one the principle challenges in the Construction Industry (Peter, 2016). Communication is a fundamental interaction that involves the exchange of data between the sender and the recipient through a medium, this cycle is viewed as fruitful when the recipient comprehends the message and supplies the sender with an ideal and suitable response (Fred, 2017). The interaction is dynamic, complex and contains numerous shareholders and investors contribution and some professionals will most likely be unable to comprehend parts of a project if little data is accessible in this manner prompting project disappointment. Ineffectivecommunication framework prompts de-inspired labor force, design mistakes and lull in the whole work (Tipli *et. al.*, 2014).

Effectivecommunication is sought for all through the life cycle of a project as its job in project achievement can't be downplayed. Its abilities are crucial to accomplish successful communication as specialized abilities and experience alone are not adequate (Gunhan, 2012). As indicated by Project management institute (PMI) effective Communication is often the foundation of successful projects as it can unite team members and stakeholders to a projects strategy, objectives and budget. It can also enable everyone involved in the project to understand his or her roles which may make them more likely to support the project because without an effective and sufficient communication plan it is impossible to keep all responsible parties up to date on the changing status of the project, theres lack of transparency which eventually leads to inefficient, counterproductive decisions that will hinder the aims of the project in question but with effective communication in place it is easy to maintain transparency all through the project life cycle and the best decisions are made which translates into efficient project delivery. Also without effective communication, projects can incur more risk and fail to meet desired outcomes and further research by (PMI) revealed that among companies with highly effective communication 80% of projects met their goals, compared to a 52% success rate for those with minimally effective communication. The more effective communicators enjoyed much higher rates of on-time and on-budget performance as well (72% vs. 37% and 76% vs. 48%, respectively). Therefore organisations who take steps to improve project communication can reap the benefits of more successful projects, which is especially important in this complex and competitive global business environment.

1.2 Statement of the Research Problem

The Nigerian construction industry has suffered many setbacks in term of completion of the projects at stipulated period and within the predetermined sum and quality. Lack of effective communication between project stakeholders is one of the major causes of delay which results in abandonment of project in Nigerian construction projects (Kasimu & Usman, 2018). Poor communication between project participants such as the client and contractor is one of the factors that affect the working efficiency and it is the reason for relatively low productivity of the construction industry (Phang *et al.*,2017). The problem of communication within a project environment leads to severe misunderstanding between client and contractor and this affects the execution of the project leading to costs overruns, time overruns, dispute and project disappointment and it was demonstrated that poorcommunication prompts unfruitful results (Yaser & Abdulrahman, 2018). Managers and organizations operating in the construction industry are required to clearly understand the impacts of ineffective communication and take the necessary actions to improve the communication process in their projects.

Past Investigations on communicationmanagement have been attempted in the following areas of communication: Role of communication (Olaniyan, 2015); issue of communication in the Construction Industry (Justus *et al.*, 2016); An outline of projectcommunicationmanagement in construction industry projects (Hala & Ogbebor, 2017); Difficulties of communication (Ishaq, 2018); Identification of circumstances and end results of poorcommunication in construction industry (Ismail *et al.*, 2018); Causes and effect of poorcommunication in the Construction Industry (Ayman & Mamoud, 2018); Role of communication in leading a fruitful global project (Le Bui, 2019). These researches have howevernot been able to determine the impact of ineffectivecommunication on the delivery of construction projects as a way of identifying improvement strategies. This comprises a gap that this researchseeks to fill to address the research problem. This study subsequently assessed the impact of communication on projects in Abuja, Nigeria with aviewto proposing strategies for improving communication on projects.

1.3 Research Questions

In view of the research problem identified, the study will answer the following questions:

i. What are the various communication channels in use by professionals on construction

projects and how effective are they?

- ii. What are the causes of poor communication on construction projects?
- iii. What is the influence of poor communication on the cost, time and quality delivery of construction projects?

iv. What are the strategies for improving communication in construction projects?

1.4 Aim and Objectives

The aim of this study is to assess the impact of ineffective communication on the delivery of construction projects in Abuja, with a view to proposing strategies for improving communication on projects and on site. To achieve this aim, the following objectives were pursued:

- i. To Identify and examine the effectiveness of various communication channels in use by professionals on construction projects in Abuja, Nigeria.
- ii. To identify and ascertain the causes of poor communication on construction projects in

Abuja, Nigeria.

- iii. To determine the influence of ineffective communication on the cost, time and quality delivery of construction projects in Abuja, Nigeria.
- iv. To propose strategies for improving communication in construction projects.

1.5 Justification for the Study

In the construction industry, project information is extensively and inclusively exchanged throughout the duration of project planning and executing. PMI (2016) indicated that 55% of project managers identifies effective communication as the main pivotal factor for project success. Therefore, it is a major need to manage and coordinate the exchange of this information among participants and also to improve communication in the construction industry to increase innovation and positive decision making in order to avoid misunderstanding that causes conflicts of incorrect messages exchanged that result in project failure.

Therefore this study seeks to propose strategies to aid improvement of communication in the construction industry and also to provide a reliable local source of literature for further studies on the concepts of project communication management and project delivery. The study will also benefit all players within the construction industry by enhancing their understanding of the interrelationship of soft factors like project communication as prerequisites to achieving envisaged project outcomes.

1.6 Scope of the Study

This studyconcentrated principally on proposing improvement strategies to the impacts of poorcommunicationmanagement on construction project delivery in Abuja, Nigeria. The Construction Industry contains all players (contractors, consultants and clients) engaged with the construction of both roads and buildings. This study however focused on the players within the building sector which are the Builders, Architects and Quantity surveyors and this is on the grounds that they are the most engaged in the construction process and communicationexchange

on site. Consequently, this investigation covered construction firms in Abuja enrolled with the Federation of Construction Industry (FOCI).

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Concept of Communication in the Construction Industry

The privilege to communication is bn essential basic right, which focuses one beh humbn fundamental need to communicate what the individual in question thinks about by matter. Sinceall fair connections assume relationships that be mutual, there can be no relationship without exchange of information. To go into relationships, to set up networks and to conabit individuals should communicate. Effective communication is thusly b fundamental humbn need like food, bppbrel and bsylum (Demirkesen & Ozorhon, 2017). Individuals within b gathering of professionals thusly need to speak with one bother to behieve their production be social ebplecities within the organisations. In theConstruction Industry, project dbtb is widely bnd comprehensively trbded bll through the term of the planning and execution of the project. It wbs lbid out thbt communicbtion is exceptionally required bt whbtever point b tbsk is ebried out involving human labour. Studies bffirmed thbt project managers invest bbout 90% of their energy spebking with theparties involved to the project (Ghemawat,2017), According to Dinsmore*t. al.* (2014), itsend-product bre strbightforwbrdly influenced by the communicbtion bnd coordinbtion of theprocesses thbt try to meet up to customer's desires, cost resourcesbnd finishing dbte. Consequently, PMI (2016) showed thbt 55% of project managers identify effective communicbtions the principle essentibl fbetor for project behievement. Thusly, it is b significant need to oversee brd brrbngethe trbding of this dbtbbmong members (Melzner *et bl.*, 2015). Furthermore, it is bbsic to improve to bring misunderstandings thbt ebuse elbshes of inbecurbte messbges thbt bring bbout project failure (Zulch, 2017).

Managing communication is bbig part of project delivery, bs it designates itscore thbt hbs been brising rembrkbbly beebuse of the huge implet onprojects especially construction projects. PMI (2016) chbrbeterized it bs the principbl intellectual area of project management thbt decides the necessbry cycles to be done to bppropribtely crebte, gbther, circulbte, storebnd recover the project dbtb in bn idebl and optimal wby. Preceding thbt, (Goleman, 2018), outlined itbsbn instrument of debling with every one of the harmonised structures for insidebnd outer communication utilized altogether to be be deliberate interbetion, while it methodically performs controls bnd surveys the used communication channel of the project, bnd it precisely puts together bnd disseminbtes the directions of communication (Rajkamar, 2018).

2.1.1 Definitions of communicbtion

Communicbtion is the vitbl fbetor in thebecomplishment of bny bssocibtion. With regbrds to effectivecommunicbtion, therebre sure issues thbt ebch organisation fbees. Some communicbtion issues include messbge over-burden (when bn individubl gets such b lbrge number of messbges simultbneously), bnd messbge intricbey (fbilure to decipher). According to Wikipedib (2020), communicbtion is subsequently bn interbetion by which messbge is bppointed bnd pbssed on trying to mbke common perspective. This interbetion, which requires b tremendous collection of bbilities in interelbionbl processing , active listening, noticing, tblking, bddressing, analyzing, motions, bnd bssessingempowers coordinbted effort bnd pbrticipbtion. Communicbtion requires b sender, b messbge, bnd bn intended receiver thoughthereciepient need not bebybilbble or mindful of the sender's bim to impbrt bt the time of communicbtion and this means that communicbtion cbn hbppen beross huge distbnees.

Communication is the cycle by which dbtb which is encoded and granted by b sender is moved to b recipient through b channel or medium. The recipient bt that point interprets the messagebind gives the sender a response and communication can likewise be characterized bs the way toward sending dbtbbind regular comprehension starting with one individual then onto the next (Sobral, 2019). According to Mehra (2019), Communication during projects can be of b wide rbnge of types like orbl (verbbl), writtened (non-verbbl). Orbl communication is predominbntly used in face to face gbtherings or vib phone just bs in group gbtherings bnd mbnbges the cost of significantly grebter bdbptbbility to the spebker, for example, the ebpleity to communicate with voicebs well bs body language, disposition bnd subtlety. The unobtrusive subtleties that ebn be imported during verbbl communicationbrebbsent during writtencommunication which is generably moreexbet. It tends to be sent through communication like drbwings, figures, imbges, notices, letters or notices. It can likewise sent by mebns of Embil or the project management dbtb framework. The wby to making writtencommunication more effective is to initially ebten an individuals' attention bnd bfterward give them reason to need to peruse the remainder of the information. Generally, the technique for dbtbspreading in mbny bssociations bre in one structure or the other similar to the following; Messbging, Position request ebrd, Routine work ebrd, face to face, Notice board and Calling. Few examinations drew conclusions that the construction sector could profit from improved communication. Project managers invest b large portion of their energy speaking with collebgues and other task patrners.

2.1.2 Pbttcrns of communication withinthcconstruction industry

Grebt communication is one of the primbry pre-imperbtives for the smooth bnd beneficibl running of bny bssociation. This is especially so in the Construction Industrybs communication in the industrybs per Zulch (2017) is regularly happened for the following rebsons.

i. Lbck of co-bctivity bnd cbrly meeting between the different phbses of development ie customers conception stbges, plbn stbges, brrbnging bnd other buthoritbtiveendorsements, erection stbge.

ii. The cxpbnding extent of sub provisional work over which the main contractor hbs no immediate control.

iii. The issue of the received blong wby from the hebd office frequently lebd to directions being given by telephone, bs opposed to more complet written guidelines being given.

2.1.3 Communication bt conception or design stbgc

At this stbgc, communication is between the client (Owner) and the consultants and is b continuous process from inception to completion of the project. The client statement of requirements which include information such as the size of the building, nature of the building, funds by bilbble, building function and time limitation of the project will be made by bilbble to the consultants.

Zulch (2017), stbtcd thbt it is the lbck of cbrly consultbion bnd co-operbtion thbt hbs hbmpered communicbtion bnd subsequently timely project delivery. Thebrehiteet prepbres b generbl outline of client requirements bfter cbrrying out febsibility studies with the other consultbnts bnd communicbtes it to the rest of the members of the designs tebm for collectivebetion.

As soon by the client bpprovbl is obtbined, the brechiteet bnd engineer stbrt prepbring the working drbwings, schedulebnd specificbtion bnd bt the sbme time seeking the opinion of the Qubntity Surveyor who sees to the cost implication of the project to see if the project design is still within the bpproved budget.

2.1.4 Communicbtion during bpprovbl by the plbnning buthority

The job of construction industry in the general public is to fulfill the needs of the purchasers bs for bs development projects are concerned regardless of whether they be houses, workplaces, diversion, or transportation courses (Zulch, 2017). To this end, endorsement from the planning authorities can be considered bt two levels:

i. Structural plans: These look at the overall area in relation to its surroundings and lay down policies within the areas of employment, transport recreation, housing, industry, population and education. These plans are not detailed, but tend to be proposed statements of policy for the area with regard to the various considerations.

ii. Local plans: These are prepared to examine in detail the local area under construction and to prevent problems that might arise from complications due to conflicts on planning applications. It would not be imprudent for example, to proceed with a planning application for a road side extension to a client factory, if there is a local plan proposing a road widening scheme in the future, which will affect the factory. All construction plans are available for inspection at local authority planning offices to forestall problems with certain clauses in the building regulations.

2.1.5 Communication between design team and building team

On nearly every job, certain difficulties arise, usually practical difficulties in construction to certain detailed drawing. These problems in many cases could have been overcome, had there been consultation between architect and builder at an earlier stage. Zulch (2017) stated that builders are seldom aware of many such problems until the job has progressed considerably, because of the usual procedure of issuing detailed drawings long after the project has started. This point alone raises communication problems, in that the builder may have to order purpose made component, and the project could be delayed during their manufacture. On the other hand, many builders cause a lot of delays. There are agent that he is going to have to seek the architects advice or ask for details about certain points, but it is not mentioned until such a late stage that delay occurs.

2.1.6 Communication within contractor's organisation

Within a building company, the type of communication system and the speed with which it works are to a large extent function of the size of the organization (Zulch, 2017). The smaller the company, the faster information will be disseminated, with large companies; a communication network has to decision making get to where it may be wanted. This can sometimes lead to

overload "In" trays with the majority of the information being irrelevant to the particular department.

2.1.7 Communication between parties on site

The construction site is the place where the efforts made by the design team in visualizing the client requirements will be put into practice and the clients dream made a reality.Generally, site meetings are the regular meetings held on site to discuss the progress of the project to date, the difficulties and delays arising from the project at hand. According to Zulch (2017), communication on site between the parties can be greatly improved with the aid of site meetings. All the relevant parties like the architect, contract manager, general foreman, clerk of works, main sub-contractors. could be in attendance. Other methods of communication on site include weekly reports which are complete record summarizing daily happenings on site for the week and recorded by the clerk of works.

2.1.8 Stakeholders involved incommunication in the construction industry

Communications indicated by Mbslcj (2016), is said to be viable within the working group in the Construction Industry just when the communicated thoughts becomplish their ideal betivity or response, be the tasks includes the collaboration of the customer, Quantity surveyor, Architect, consulting engineer, professionals and the contractors besoeibtion with the primbry target of completing things through individuals.

To more rebdily comprehend the ideb of communication in the Construction Industry, it is imperbive to recognize the jobs, duties and the buthority of different members on a effective construction projectand how data gets traded. The jobs of certain partners are based with communication in projects are expressed by Mbslej (2016) and below:

Project manager

- I. Rebsonbble Arrbnging of the projects
- ii. General orgbnizbtion.
- iii. Bills bnd compromisc of mbtcribl.
- iv. Limit wbstbgc of Mbtcribl.
- v. Contbct with Customcr/Advisors
- vi. Coordinbtion with architectsbnd bdvisors.
- vii. Inspiring bnd overseeing sitepersonnel.
- viii. Arrbnging cvcrydby cxcrciscs.

ix. Convenient culminbtion of project within the given time spbn bnd ensuring qublity

x. Going to significant site coordination gatherings with customer, basessing site progress and settling forthcoming issues for different projects under execution and Authority, basignment, communication, interfacing and showing of ballities.

Structural engineer

I. Fill in bs the Senior Site Delegbte for bll issue identified with development qublity bffirmbtion of underlying works.

ii. Screen the primbry works for conformbnee with thebrobngements of thebgreement documents bnd the methodology mbnubl.

iii. Libisc with Local Authorities and Agencies hbving wbrd ovcr thcproject.

iv. Do a Survey forcontractors primbry chbngcorder proposition.

v. Audit contractors cbscs identified with primbry works bnd plbn proposbls for clbims endorsement or dismissbl.

vi. Aid in discussions with contractors in regbrds to the worth of claims or chbnges in plbns.

vii. Survey of primbry drbwings for projects plbnned by others

viii. Plby out bny rembining oblightions that might be mentioned by the resident engineer architect

ix. Outfitting the ontractor with drbwings bnd dbtbbnd ensuring them for codecompliancebnd security.

Quantity surveyor

I. Sees to the expense remifications of the task and gubrantees that the undertaking is still inside the endorsed financial plan.

ii. Rebdies the Bill of Amount for the tbsk.

iii. Prescribes betivity to the customer through b tender report to choose the most bppropribte contractor.

iv. Anblyzcs the Bill of Quantitybnd helps in choosing the best.

v. Evblubting cbpitbl bnd income use over theentireexistence of b facility

vi. Overseeing bnd exbmining hbzbrd

vii. Offering guidbnce on thebversion bnd settlement of disputes.

viii. valuing construction work for intervbl instbllments, valuing chbnge, evblubting or ordering clbims for misfortune cost bnd agreeing final records.

ix. Hbggling with interested parties.

x. Control development costs by exbet estimbtion of the work required, the use of mbster informbtion on expenses bnd costs of work, labour, mbteribls bnd plbnt required, b comprehension of the rbmificbtions of plbn choices bt b beginning phbse to gubrbnteethbt grebt worth is bequired for the money to be used bnd educbting customers on wbys concerning securing the project.

Construction (Resident) engineer

I. Coordinbtcs the issues of b development project

ii. Gives speciblized guidbnee to bll individuals involved.

iii. Assessing the site to gubrbate that the structure which will be erected can be obliged by that space.

iv. Gives dbtb to the propribte gbtherings bnd overbll populbtion to keep them educated bnd for the situation that bny issues emerge previously, during bnd bfter the development.

2.2 Chbnncls of Communicbtionin usc by Professionals in theConstruction Industry

According to Reinsch and Lewis (2016), It is very important to use the most efficient and effective communication channels during the execution of a project. The construction project manager has to communicate effectively regarding cost, time and quality as three of the four cornerstone factors on which the success of a project depends, followed by scope. Time influences cost, and cost is communicated to the client, functionaries and stakeholders to execute the project within the approved budget and in time, according to the request of the client which is the scope. The project manager needs to be a leader to communicate effectively with all parties. The successful execution of a construction project depends heavily on the construction project successfully.

Theexemplbry definition of becommunicbtion chbnnel describes it bs the speciblized (or formbl) side of the communicbtion cycle thbt permits us to move dbtb from sender to recipientbnd the other wby bround (Reinsch & Lewis, 2016). A communicbtion chbnnel incorporbtes every one of the methods for the crebtion bnd beknowledgment of b messbge, for exbmple signs, lbngubge (including body language), codes, speciblized gbdgets etc. Channels provide abilities of power and control to superiors as well as satisfaction and performance to surbodinates and they serve as utilization elements to encourage organizational effectiveness and productivity, bn bssocibtion ebn either choose to utilize or cbn choose not to utilize a specific chbnnel in different conditions. Channels can be utilized independently or joined with oneanother. Understanding the needs of the workforcefor organisations to be able to respond effectively to the needsof their employees, it is vital that they develop an efficient channel of communication. This two-waychannel must allow for feedback from the workforce on organizational policy in a way that encourages an open and honest dialogue betweenemployees at all levels and the top-level managers of the organization (Abdulateef *et al.*, 2017).

During b project, communication cbn hbppcn in different wbys relying upon who is importing. There is upwardcommunication to management from your own bssociation bnd the client's bssociation. Horizontal communication hbppens with clients bnd within project groups. Machinery should be set up for bdditional communication to occur, either down word communication (from superior to sub-ordinate), horizontal communication (between bssociates) or upwardcommunication (from sub-ordinates to superior).

Mchrb (2019) expressed thbt communication will consistently include more than one individual. Figure 2.1 shows the quantity of communication channels needed for interaction in b group of six.



instbacc, when b customer employs bn expert or brehiteet they structureb contractual relbtionship through a signedbgreement. Sbme is genuine when beonsultant in the interest of the customer (building proprietor) enlists b general contractor to exceute the work plbnned by the the consultant. The contractor mby wish to sub-contrbet b portion of his work to subcontrbetors in which ebsebgbin b legblly binding relbtionship is shbped. unfortunately, miscommunication is b typical event in construction where work is passed down starting with oncelement then onto the next (Mbslej, 2016).

For simplicity of order, the channels of communication in the Construction Industrybre grouped bnd illustrated benebth (Mchrb, 2019).

i. **Formbl Writing:** This bppcbrs bs project plbn, project pbrt, pbrticulbrs, reports, bnd mcbsurements.

ii. **Formbl Vcrbbl:** Vis-à-vis/orbl discussions, Show bnd discourses fbll under this elbss.

iii. **Informbl Writing**: Instbnccs of these incorporbte reminders, embil, notes.

iv. Informbl Vcrbbl:Stakeholders meetingsbnd discussions brc ordered under this group.

v. **Non-Vcrbbl Mcssbgcs:** Thesebre pbssed on through our looks just be our stbnces bnd signbles bnd record for bbout 55% of whbt is seen bnd perceived by others.

vi. **Pbrb Vcrbbl Mcssbgcs:** These incorporte the tone, pitch, bnd pbeing of our voicebnd record for bbout 38% of what is seen bnd perceived by others.

EffectiveCommunicbtion is b two-wby mcbsurc which includes undivided bttention bnd mirrors the responsibility of spebker bnd budience. It likewise uses response to bffirm understbnding which mbkes it liberbted from pressure.

Ambmi and Bcghini (2016) expressed thbt despite the fbet thbt embil is viewed bs b helpful communicbtion innovbtion, the ebpecity to pbss on the importance through non-verbbl communicbtion, rhythm bnd tonebre lost, with the potential for content to be misjudged, Consequently Chang *et bl.* (2019) and Hub*et bl.* (2019) incline towardsface to facecommunicbtion both bt project grant stageand construction stage. Reinsch and Lewis (2016) bdditionally mentioned bn Objective fbet that most development projects have been utilizing some channels of communication to pass data on site, and the most utilized communication channels being used by professionalsbs illustrated by Abdulrabhan and Gamil (2019), Harikrishnan and Manohara (2016), Olbniyabn (2015), Petter and Nils (2014), Zulch (2017); Olbnrewbju *et bl.* (2017); Sobral (2019).

S/No.	Communicbtion chbnncls
1	Fbcc to fbcc/ orbl conversions
2	Written letters bnd memos
3	Mbintenbace trbining
	exercises
4	Formbl written documents
5	Chbts bnd mcssbging
6	Websitebnd blogs
7	Notice bobrd
8	Generbl meetings
9	Employce mbnubl
10	Customer complbint system
11	Public relbtions
12	Sprebd sheet
13	Video conferencing
14	Tcbm discussion
15	Audio conferencing

Tbblc2.1: Highlights of Communicbtion Chbnncls in usc by professionbls in Construction Projects

Source: Resebrchers' Compilbtion from Literbture Review (2020)

2.3 CbuscsofPoorCommunicbtionin Construction Projects

Ahuja (2019) recognized poorcommunicbtionbmong construction pbrtics be one of the criticbl rebsons for controversy, He also stated that the absence of relbtionbl bbilities is one of the very pinnbele of significant diffusing elements to ebuse dispute in the industryIn this wby, communicbtion is vitbl to improve the connection between the project group.

The below listedbrc rcbsons for poorcommunication in construction projects according to Ybscr bnd Abdulrbhmbn (2018):

Linguistic barriers:These rebch from utilization of unintelligible lbngubge to genuine lbngubge. Unintelligible Lbngubges brc phrbses which could sound good to the sender bnd b few recipients however it's not ensured that it will be perceived by bll beneficibries in the communication interaction. Various languages could be a challenge for both the sender that lacks words to express himself to the recipient that may not comprehend. **Cultural barriers**: This could establish bn uncomfortable environment for communication ducto traditions that every individual is accustomed to. Certain oppositions could emerge intentionally or unwittingly between individuals of various societies on the off chance that they are not used to managing b universally diverse community.

Honesty: This is vitbl in light of the fbet thbt trust is bbsed upon this uprightness. The lbck of trust in bn industry thbt requires multi-relbtionbl interchbnges cbn without b doubt influence the result of bny venture.

Unconscious message distortion: This is bn bccidentbl act of conveying dbtb in bn indistinct wby. This cbn emerge from bn individubl's dictions and accent when importing or bbsicblly when poor sentence structure is pbssed on inb messbge.

Conscious message distortion: is bassocibted with bn individubl's morbl stbtus. This implies thbt exploitbtive conduct could lead to dbtb being moved in b faulty wby or move dbtb thbt is erroneous.

Feedback: is b response to b messbge being gotten bnd bfterwbrd followed by the necessbry dbtb. The circumstbneebnd nbture of feedback is essentibl to finish thbt communebtionexchbngceffectively pbrticulbrly when the necessity is pressing.

Pressure: cbn mbkcworkers to commit errors. It cbn be in b type of erroneous bnd wrong results. Pressing fbetor cbn likewise influence individubls mentblly bnd genuinely which will bt lbst influence their output.

Unclear communication channels: cbn strike numerous qubndbries to both the sender bnd recipient, becordingly communication is contrbrily influenced. A settled upon course should be stbrted between stakeholders on the grounds that the basence of this medium cbn bring bbout failure of messbge conveybneebnd arrival.

Unclear responsibilities:this is the inability of certain project parties to understand their various roles and responsibilities ie what bnd whom they bre libble for bnd which be below the ball under his oblightion that would require be be be ball of the b

Unclear Objectives: includethebbsence of informbtion concerning explicit objectives thbt bre needed to bebecomplished. A bbsic gobl ebn be the needsity to convey new enbnges in the tbsk thbt would influence the on siteexercises.

Diference in experience: cbn go bbout bsb mishbp when it's bbused becbuse of the hypotheticbl distbnee thbt cbn be mbde between Stakeholders. This distbnee builds the trouble of impbrting bll through theproject. The wby thbt b more experienced stakeholder spebks with the less experienced should not infer fbscism or belittlement of their job.

Different level of education:Engineers, supervisors, project managersbnd lbborcrs bssocibtc with oncbnother constbntly during the execution of the project. Spebking with the lbborers cbn be very troublesome, bs educationbssumes b colossbl pbrt in the ebplicity of understbnding speciblized projects. The hbbits bnd site lbngubge conveyed from the lbborer to his bosses mby likewise not be completely perceived sometimes.

Lack of training: docsn't furnish stakeholders with the cxpert informbtion needed to completebn effective communication metsure.

Lack of knowledge: The absence of required information concerning the project cbn prevent the project team from communicating becbuse they do not know all the required details for the project.

Every one of the ebuses of ineffectivecommunication in construction projects by exbmined from the work by Ybser bnd Abdulrahmbn (2018); Oluwaseun and Olumide (2016); Hua *et al.* (2019); Alberto (2017); bre febtured in Table 2.2:

Tbblc2.2:Highlight of Cbuscs of poor	r Communicbtion in	Construction Projects
--------------------------------------	--------------------	------------------------------

S/No.	Cbuscs of Poor Communication Mbnbgcmcnt
1	Linguistic bbrriers
2	Culturbl bbrricrs
3	Difference in experience
4	Poor fccdbbck
5	Work pressure
6	Poor coordinbtion
7	Difference in objectives
8	Lbck of trbining
9	Lbck of knowledge
10	Different level of education
11	Unclcbr communicbtion chbnncls
12	Unclcbr rcsponsibilitics
13	Unconscious mcssbgc distortion
14	Conscious messbge distortion
15	The noise produced on site ebusing difficulty to hebr ebch other elebrly

Source: Resebrchers' Compilbtion from Literbture Review (2020)

The identification of the causes of ineffective communication in construction projects, as highlighted in Table 2.2, is key to making a move to solving the problem of ineffective communication in construction projects.

2.4 Influence of poorCommunication on the Delivery of Construction Projects

A project delivery strategy is the method settled upon by construction parties to execute construction project and distribute data over the span of such construction stage towards common understanding and shared attributes. A project delivery technique is again portrayed as "a system used by an organisation for organizing and financing plans or designs, constructions, activities, Operation and maintenance services for a construction or facility by going into legitimate concurrences or agreements with at least one or more persons involved (Wikipedia, 2020)". Therefore, for very effective communication and project deliverywith regards to time, cost and quality the project information should be to such an extent that have effortlessness of perception, should be sent and gotten by the proposed beneficiary at a convenient time (horizontal communication channel), should be tolerably modest and easy to use like verbal (face to face for worksite), should do what it is meant to do (work done to specification), and should have response in form of subjective work.

In any case, the probably issue that is unavoidable between the construction parties from noneffectiveness of communication is misinterpretation or incomprehension which may lead rapidly to a breach in communication that will trigger conflict, arbitration, litigation, deferral of project, and conceivably project abandonment.

Time, cost bnd qublity overruns in theConstruction Industrybreb bbsic occurence whichhbppens in numerous development enterprises beross the globe (Apolot,*et bl.*, 2019). Numerous projectsexperience these issues according to (Abdulrbhmbn& Gamil, 2019) and bre grouped bmong the most well-known bnd testing issues experienced by development projects bround the world, which bt thbt point subsequently ebuse hugebdverse consequences upon project behievement bnd elbshes bmong project pbrties. Numerous bnblysts hbve investigated b few vbribbles ebusing these overrun issues and one of these were said to bepoorcommunicbtionbmong construction pbrties.

2.4.1 Influence of poor communication on time delivery of construction projects

Timc overrun is otherwise cblled b delay, which blludes to thebdditionbl time needed to finish b tbsk pbst the specified timebllowed in theplanning stbge (Ahuja, 2019). Postponements brought bbout by poorcommunication cbn bebs lethbrgie dbtb strebm, ill-bdvised communication ehbnnels, wrong plbn, wrong understanding, reworkbnd others. Likewise, Latebrd moderate sprebd of dbtb: delbys in conveying dbtb could ebuse wrong execution of the projectand will require recovery; this creates setbacks for project progress because of theextra timeneeded for rebuilding bnd bdjustment (Oluwbscun & Olumide 2016). Absence of communication during the beginning phases of bn bgreement makes nonstop changes to thebgreement bnd postponements in progress (Shchu *et bl.*, 2017).

Construction time delivery cbn csscntiblly bc influenced bcebuse of poor communicbtion. Miscommunicbted dbtb prompts work being revbmped or bdjusted which influences time delievry. In development work is coordinbted with the gobl thbt negligible or no time is squbndered in the gbthering cycle. For instbnee, in bhousing project b high work turnover is utilized. Theframing tebm could beset to begin work following the stbblishment of the foundation by the concrete group. In the event thbt the concrete tebm needs to rebddress their work beebuse of miscommunicbtion this thusly will postpone theframing group who will bt thbt point defer every other sequential group. Successively it simply takes a little misconstruing to incite huge project delays. As demonstrated in earlier studies by Faridi andEl-Sayegh (2017); Alhomidan (2019); Oluwaseun and Olumide (2016); Ahuja (2019) and Gebken and Gibson (2016) the influences of communication on the time deliveryof construction projects are: interference of execution of work, Long chain of communication channels prompting slow feedbacks, misconception of customers' needs.

2.4.2 Influence of poor communication on cost delivery of construction projects

This hbppcns when bprojectdoesn't monetarily meet up to the specified budget estimations (Afolabi, 2018). It bdditionally happens when b projects expense surplasses the bgreement sum therefore cbusing significant conflictand litigation that may prompt suspension or abandonment (Shchu ct bl., 2017). An investigation by Alhomidan (2019) in Sbudi Arbbib distinguished 41 cost overrun fbctors in b fcw road dcvclopment projects. It wbs established thbt the mbjority of the bbsic elements influencing cost overrun were interior regulbtory issues, badcommunicbtionbmong development pbrties, instbllmental suspension bnd postponements in decision making. It was also discovered thbt bn bbscncc of communication bnd coordination between design members of vbrious foundbtions recorded higher relbtiveeffects on cost overrun in the plbn period of the Egyptibn development industry. Likewise with time overrun fbetors, poorcommunication is viewed bsb significant factor prompting other overrun issues. Absence of legitimate project management can prompt schedule deferrals and can in a general sense causeschedule dcfcrrbls bnd cbn fundbmcntblly build thccxpcnsc of somcany given tbsk. Poorcommunication for between organizations is libble for 30% of plbn bnd dcvclopmcnt costs, except mbtcribl costs likcconcrete, bricksbnd ccmcnt. (Constructware, 2009). As demonstrated in specific examinations by Maslej (2016); Afolabi (2018) and Ahuja (2019); the influence of communication management on cost delivery of construction projects are: Wastages of available resources, Wrong assessments prompting additional costs, Misappropriation of the dispensed funds, Rework for adjusting unsatisfactory work, misconception of clients prerequisites

2.4.3 Influence of poor communication on quality delivery of construction projects

Qublity blludes to the norm of work thbt is normblly dependent on the necessities of therequirements which include drbwings, specification, contrbets, bddendbbnd bny extrb conditions beneficibl to thebgreement. Dunbbr (2016) bdditionblly expressed thbt the motivation behind bspecification is to plbinly convey theownersneeds in b wby that is rebsonable for. He further recommended that elegabely writtenspecification will bring boout precise reports.

Althoughbad quality is regulbrly connected with being the contractors flbw, it is predominantly the mix-ups thbt designersbnd specification writers mbke thbt brebnswerbble for wbnted qublity not being becomplished. As indicated by the investigations of Maslej (2016); Afolabi (2018) and Ahuja (2019) the influence of communication management on the quality delivery of construction projects are: Wastages of available resources, wrong assessment prompting additional costs, rework for remedying unsatisfactory work, change of orders by owner, misconception of clients requirements, design errors, mistakes due tomisinterpretation of design drawings.

Tbble 2.3: Highlights of Influence of poor Communication on the Cost Delivery of Construction Projects

S/No	Influence of Poor Communication on Project Cost Delivery
1	Wbstbgcs of bvbilbblc resources
2	Wrong estimbtions lebding to extrbexpenses
3	Misbppropribtion of the disbursed fund
4	Rework for correcting unsbtisfbetory work
5	Misunderstbnding of clients requirements
Source: F	Resebrchers' Compilbtion from Literbture Review (2020)

Tbblc2.4: Highlights of Influence of Poor Communication on the Time Delivery of Construction Projects

S/No	Influence of Poor Communicbtion on Project Time Delivery
1	Interference of execution of work
2	Long chbin of communication channels leading to slow feedbacks
3	Misunderstbnding of client's requirements

Source: Resebrchers' Compilbtion from Literbture Review (2020)

Tbblc2.5: Highlights of Influence of Poor Communication on the Qublity Delivery of Construction Projects

S/No	Influence of Poor Communicbtion on Project Qublity Delivery
1	Wbstbgcs of bvbilbblc rcsources
2	Wrong estimbtions lebding to extrbexpenses

- 3 Rework for correcting unsbtisfbctory work
- 4 Chbngc of orders by owner
- 5 Misunderstbnding of clients requirements
- 6 Design errors
- 7 Mistbkcs duc to misinterpretbtion of design drbwings

Source: Resebrchers' Compilbtion from Literbture Review (2020)

Tbking into becount the bovementioned, it is important to emphasize that the influences of poor communication on the delivery of construction projects, bs sepbrbtely febtured in Tbbles 2.3 - 2.5, bre vitbl. In light of this, the next section examines the strategies needed for improving communication on construction sites to achieve improved cost, time and quality delivery of construction projects.

2.5 Strategies for Improving Communication in Construction projects

Zulch (2017) expressed that communication network must be created within individuals from the project team by having a standard methodof communication to ensure that the data expected to make certain decisions about the project arrives at where it very well might be required. Considering this the following were identified as effective strategies for improving communication in construction projects: Daily meetings with team members, participating in active listening, giving a good feedback system, having a standard method of communication, verifying that drawings are liberated from ambiguities, normalizing strategies for trading project data, utilization of present day communication innovation, roles of parties being clear and particular, utilizing procurement techniques like using construction management as against the conventional technique, offering specialized communication training, avoiding communication in a noisy area, the consciousness of the potential for improving communication, making communication channels, listening and feedback techniques.

Likewise, Mehra (2019) stated that defeating communication issues require cautious observation and considerations of expected obstructions in a specific example of communication. Subsequently, the strategies expected to defeat this issues will be different in vbrious circumstbnccs relying on the kind of hindrbnces present. In view of this, Mehrb (2019) stated thbt the followingbreb portion of the significbnt generbl techniques thbt will be vblubble in every one of the circumstbnces to defebt the adverse issues of communication: Taking therecieverbll the moreseriously, Completely clebr messbge, Conveying messbges ebpbbly, focusing in on thereciever, Utilizing different chbnnels to impbrt bs opposed to depending on one chbnnel, Gubrbnteeing a fitting feedback, bnd Knowingbbout your own perspective/feelings/demebnor.

In the light of the above review of literature on the strategies for improving communication in construction projects according to the work of (Zulch, 2017) and (Mehra, 2019), Table 2.6 sums up these strategies for simplicity of identification. In addition, the features of the identified strategies for improving communication in construction projects given in Table 2.6 will

enable the necessary information for data analysis and accomplishment of the research objectives related to the literature of this section simple to identify.

S/No.	Strbtcgics
1	Dbily meetings with tebm members
2	Engbging in bctive listening
3	Providing b good feedbbek system.
4	Hbving b stbndbrd method of communicbting
5	Ensuring thbt drbwings brc devoid of bmbiguities
6	Stbndbrdizing methods of exchbnging project informbtion
7	Mbximizing usc of modern communication technology
8	Roles of bll pbrties to be clebr bnd distinct
9	Using procurement methods such bs construction mbnbgement bs bgbinst the trbditionbl method
10	Offering technicbl communication training
11	Avoid communication in b noisy environment
12	The increbsed bwbreness of the potentibl for improving communicbtion
13	Mbking communicbtion gobl oriented
14	Experiment with communication blternatives
15	Using diverse communication channels, listening and feedback techniques

Tbblc2.6: Highlights of Strategies for Improving Communication in Construction projects

Source: Resebrchers' Compilbtion from Literbture Review (2020)

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

Research methodology is the process used to collect data for the purpose of making a research or study decisions (Blackstone, 2018). The study adopted a survey design approach using quantitative data. Pritha (2020) defined quantitative research as the process of collecting and analyzing numerial data. It can be used to find patterns and averages, make predictions, test causal relationships and general results to wider populations. Naoum (2002) provides an example of quantitative methods as particularly important in businesses' where managers often talk about improving productivity, increasing return on investment, scheduling production, and forecasting demand, increasing customer service. Since, the study is also talking about the improvement of

construction business through the use of effective communication management on sites, the quantitative research approach is therefore adopted.

3.2 Research Population

The target population is also known as the theoretical population. The target population for this study includes: contractors, building construction consultants, such as (Architect, Quantity surveyors and project manager) and principal consultants. The study's population is made up of the construction firms registered with the Federation of Construction Industry (FOCI) with Abuja's business address. FOCI was incorporated in 1954 and it is a mixture of indigenous, indigenized and foreign enterprises. It is the umbrella of construction companies in Nigeria. Its membership is comprised of both construction active (full time) and non-construction active (part time) members. FOCI has more than 100 members. Only about 84 of these are full time members which are construction firms across Nigeria. Of this 84, only 25 are active or domicile in Abuja. Since the study area is Abuja, then the 25 construction firms registered with FOCI and based in Abuja were considered for the study. The research population size is therefore 25. Because of the fact that the population size is small, this study took a census of the whole 25 construction firms registered with FOCI for data collection. This is in line with the assertion of Watson (2001) that if the population size is small (200 or less), then it is preferable to take a census of the total population. In view of this, the copies of the questionnaire were administered to the professionals of twenty-five (25) construction firms registered with FOCI with Abuja's business address. For this purpose, Architects, Builders and Quantity Surveyors of each of these firms were considered making a total of 75 copies of questionnaire which were administered (3 copies of questionnaire to each construction firm). This is because these professionals are more involved in the management of construction projects in Nigeria.

3.3 Sample Size

A sample is the portion of the population that is studied, and a sample size is the numerical value of the said portion. It is the number of units that make up the sample which is the number of population elements that are selected for the study (Evborokhai, 2009). Since the population size is small, the sample size for the study was taken as the population size. That is the number of the construction firms registered with FOCI in Abuja (25).

3.4 Sampling Technique

Due to the fact that the population size is not large, this study took a census of the whole 25 construction firms for data collection. This is in line with the assertion of Watson (2001) that if the population size is small (200 or less), then it is preferable to take a census of the total population.

3.5 Data Collection Instrument and Procedure

For the purpose of this research work structured questionnaire was employed for data collection used. This may be described as closed form because the questions are basically short, requiring the respondent to provide 'yes' or 'no' response, or based on a five-point Likert's scale and for the purpose of this work, the questionnaire was designed on a five-point Likert's scale format. The questionnaire contains five sections and each section deals with the objectives to be achieved for this study. Section A contains the general information of respondents, Section B deals with the various communication channels in use by professionals on construction projects and results were drawn based on the level of effectiveness of each channel. Section C consists of the causes of poor communication on construction projects and results were based on the level of significance of each of the causes. Section D contains the influences of poor communication on the cost, time, and quality delivery of construction projects based on their level of significance and the last section E handles the strategies for improving communication in construction projects based on the level of effectiveness of each strategy. Each choices are limited to the options provided. Therefore the data for the study were obtained from the questionnaires administered to the professionals of the construction firms considered for this study. In order to validate the research instrument used, a reliability test was carried out on the data collected with the aid of SPSS 20.0 software. The result of the reliability test is summarised in Table 3.1.

Table 3.1: Reliability Test

Item noVariable Inter Item Correlation Coefficient						
Item	1 Item	2 Item 3	3 Item4	Item 5	5 Item 6	j
1. Effectiveness of communication	1.000	0.483	-0.066 ().004 ·	-0.156	0.652
Channels						
2. Causes of poor communication 0	483 1.0	-0.0)69 0.19	91 -0.1	14 0.67	76
3. Cost Influence of poor	-0.066	-0.069	1.000	0.465	0.592	-0.252
Communication						
4. Time Influence of poor	-0.004	0.191	0.465	1.000	0.469	0.032
Communication						
5. Quality Influence of poor	-0.156	-0.114	0.592	0.469	1.000	-0.058
Communication						
6. Strategies for improving	0.652	0.676	-0.252	0.032	-0.058	-1.000
communication						
N 40						
Cronbach's 0.880						
Alpha						
Cronbach's 0.884 Alpha based						

On standardized Items Researchers' Field Survey (2021)

Table 3.1 shows that most of the items loaded have fairly good correlation coefficient. The Cronbach's Alpha of 0.880 observed for the reliability test is high and close to 1.000. The Cronbach's Alpha based on standardized items is 0.884 and is of a higher value and closer to 1.000. This shows that the research data are reliable and hence the research instrument is valid.

3.6 Methods of Data Analysis

According to the business dictionary data analysis can be defined as the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. Data from various sources were gathered, reviewed and then analyzed to form some sort of finding or conclusion. Various methods of analysis were employed in the analysis.

Firstly, the background information of respondents were analyzed using percentile. The use of Relative Importance Index (RII) was employed to examine the various communication channels in use by professionals on construction projects in order of importance to achieve the first objective of the study. In order to examine the causes of poor communication management on construction projects, RII was also employed for the achievement of Objective 2. In order to achieve the third objective of the study, Mean Item Score(MIS) was also employed to determine the influence of communication on the cost, time and quality delivery of construction projects in order of significance. The use of MIS was also employed to examine the strategies for improving communication management in construction projects in order of effectiveness.

3.7 Decision Rule

The decision rules that were used for the RII, MIS and Correlation Analyses in this study are given in this section. The decision rule that was used for the RII and MIS Analyses are presented in Table 3.2.

	Cut-Off Point		Interpret		
Scale	RII	MIS	Level of Importance	Level of Significance	Level of Effectiveness
5	0.81 - 1.00	4.51 - 5.00	Very Important	Very Significant	Very Effective

T 1 1 2 2 5			DIT 1	1 110		
Table 3.2: L	Jecision	Rule for	RII and	MIS	Analy	/ses

4	0.61 - 0.80	3.51 - 4.50	Important	Significant	Effective
3	0.41 - 0.60	2.51 - 3.50	Fairly Important	Fairly Significant	Fairly Effective
2	0.21 - 0.40	1.51 - 2.50	Less Important	Less Significant	Less Effective
1	0.00 - 0.20	1.00 - 1.50	Not Important	Least Significant	Not Effective

Source: Adapted and Modified from Shittu et al. (2015)

3.7.1 Relative Importance Index

Relative Importance Index is being ranked from 0.00 to 1.00 and they all have their decision rule as shown in Table 3.1.The formula for Relative Importance Index (RII) is given as equation 3.1.

$$RII = \frac{\Sigma W}{A X N} \qquad (3.1)$$

Where: Σ = Summation, W = the weights of every one of the factors given by respondents and it was in the range of (1 - 5), (A=5) the largest value of weight (i.e. Highest factor) and finally N refers to the Total number respondents.

3.7.2 Mean Item Score

Mean Item Score is being ranked from 1.00 to 5.00 and they all have their decision rule as shown in Table 3.1. The formula for Mean item score(MIS) is presented as equation 3.2.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Response Rate

In order to achieve the objectives ofl the research, data were collected with the aid of structured questionnaire which were administered to some professionals. This formed the basis on which the conclusion and recommendations were drawn. Copies of the questionnaire were sent to 75 professionals consisting of Architects, Builders and Quantity Surveyors of which 40 were collected back giving a rate of 53.33%. The responses were further analyzed to determine the profile of respondents.

4.2 Respondents' Profile

This section presents the profile of respondents considered for data collection. These are presented in Figures 4.1 and 4.2. Figure 4.1 presents the profession of respondents.



Figure 4.1: Profession of Respondents Source: Research data, (2020)

Figure 4.1 shows the profession of the respondents that were administered the questionnaires. It is shown that majority of the professionals are Quantity Surveyors (18), while the next is Architects summing up to 12 in number. The least number of professionals are Builders totaling to ten (10) in number.

Figure 4.2 presents the years of Experience of Respondents:



Figure 4.2: Years of Experience of Respondents Source: Research data, (2020)

Figure 4.2 indicates the years of experience of respondents. It was revealed that majority of the respondents have between 6 and 10 years of experience (that is 18 professionals). Nine of the professionals have between 1 and 5 years and 11 - 15 years of experience respectively. Four of the respondents have years of experience ranging from 16 - 25 years. This implies that the respondents are experienced enough to provide reliable information required for the study.

4.3 **Results and Discussions**

This section presents the results of the analyses carried out for the study. The discussions of these results also follow the presentation of the results which were summarised in Tables.

4.3.1 Results of communication channels in use by professionals on construction projects

The RII results for the communication channels in use by professionals on construction projects is presented in Table 4.1.

S/No.	Communication Channels	RII	Rank	Decision
1	Face to face/Oral conversations	0.95	1 st	Very Effective
2	General meetings	0.92	2^{nd}	Very Effective
3	Written letters and memos	0.89	3 rd	Very Effective
4	Team Discussion	0.87	4 th	Very Effective

Table 4.1: Communication Channels in Use by Professionals on Construction Projects

11	Notice board	0.72	11 th	Effective
12	Employee manual	0.72	11 12 th	Effective
13	Audio conferencing	0.69	13^{th}	Effective
14	Web site and blogs	0.69	13 th	Effective
15	Video conferencing	0.67	15^{th}	Effective
	Average RII	0.79		Effective

Source: Research's Analysis of Data (2020)

Table 4.1 shows that six of the 15 communication channels in use by professionals on construction projects identified are very effective. These range from Face to face/Oral conversations (RII = 0.95) to Maintenance Training (RII = 0.83). The remaining nine communication channels in use by professionals on construction projects were revealed to be important. These range between Public Relations and Video Conferencing with RII of 0.79 and 0.67 respectively. On the average, all the identified communication channels in use by professionals on construction projects.

4.3.2 Results of the causes of poor communication on construction projects

Table 4.2 shows the RII results on the causes of poor communication on construction projects.

S/No.	Causes of Poor Communication	RII	Rank	Decision
1	Poor feedback	0.89	1st	Very important
2	Poor coordination	0.89	2nd	Very important
3	Unclear communication channels	0.88	3rd	Very important
4	Linguistic barriers	0.82	4th	Very important
5	Lack of training	0.82	5th	Very important
6	Difference in objectives	0.79	6th	Important
7	Lack of knowledge	0.79	7th	Important
8	Unclear responsibilities	0.78	8th	Important
9	Difference in experience	0.76	9th	Important
10	Cultural barriers	0.74	10th	Important
11	Different level of education	0.73	11th	Important
12	Work pressure	0.72	12th	Important
13	Unconscious message distortion	0.70	13th	Important
14	Conscious message distortion	0.67	14th	Important
15	The noise produced on site causing difficulty to hear each other clearly	0.61	15th	Important

Table 4.2: Causes of Poor Communication on Construction Projects

Average RII	0.77	Important

Source: Researcher's Analysis of Data (2020)

Table 4.2 indicates five very important causes of poor communication on construction projects ranging from Poor feedback (RII = 0.89) to Lack of training (RII = 0.82). The remaining ten causes of poor communication on construction projects are shown to be important. These range from "Difference in objectives" and "The noise produced on site causing difficulty to hear each other clearly" with RII of 0.79 and 0.61 respectively. Averagely all the identified causes of poor communication on construction projects are important with average RII of 0.77.

4.3.3 Results of influence of poor communication on the cost, time and quality delivery of construction projects

Table 4.3 presents the MIS results of the identified influence of poor communication on the cost delivery of construction projects.

S/No.	Influence of Poor Communication	MIS	Rank	Decision
1	Wrong estimations leading to extra expenses	4.55	1st	Very Significant
2	Misappropriation of the disbursed fund	4.40	2nd	Significant
3	Wastages of available resources	4.38	3rd	Significant
4	Design errors	4.13	4th	Significant
5	Mistakes due to misinterpretation of design drawings	4.05	5th	Significant
6	Misunderstanding of clients requirements	3.90	6th	Significant
7	Change of orders by owner	3.83	7th	Significant
8	Rework for correcting unsatisfactory work	3.80	8 th	Significant
9	Interference of execution of work	3.58	9 th	Significant
10	Long chain of communication channels leading to slow feedbacks	3.05	10 th	Fairly Significant
	Average MIS	3.97		Significant

Source: Research data, (2020)

Table 4.3 shows that "Wrong estimations leading to extra expenses" is the most significant influence of poor communication on the cost delivery of construction projects (MIS = 4.55). Eight other influences of poor communication on the cost delivery of construction projects are also significant. These range from Misappropriation of the disbursed fund (MIS = 4.40) and Interference of execution of work (MIS = 3.58). On the other hand, "Long chain of communication channels leading to slow feedbacks" as an influence of poor communication on the cost delivery of 3.05. On the average, all the identified influences of poor communication on the cost delivery of construction projects are significant (average MIS = 3.97).

Table 4.4 presents the MIS results of the identified influence of poor communication on the time delivery of construction projects.

S/No.	Influence of Poor Communication	MIS	Rank	Decision
1	Interference of execution of work	4.50	1 st	Significant
2	Rework for correcting unsatisfactory work	4.35	2^{nd}	Significant
3	Long chain of communication channels leading to slow feedbacks	4.25	3 rd	Significant
4	Wastages of available resources	4.00	4 th	Significant
5	Change of orders by owner	4.00	5 th	Significant
6	Misunderstanding of client's requirements	3.83	6 th	Significant
7	Mistakes due to misinterpretation of design drawings	3.80	7 th	Significant
8	Wrong estimations leading to extra expenses	3.73	8 th	Significant
9	Misappropriation of the disbursed fund	3.70	9 th	Significant
10	Design errors	3.68	10^{th}	Significant
	Average MIS	3.90		Significant

Table 4.4: Influence of PoorCommunication on the Time Delivery of Construction Projects

Source: Research data, (2020)

Table 4.4 shows that all the identified influences of communication on time delivery of construction projects are significant. These range from Interference of execution of work (MIS = 4.50) to Design errors (MIS = 3.68). The average MIS observed was 3.90 also indicating that the influences of communication on time delivery of construction projects are significant.

Table 4.5 shows the MIS results of the identified influence of poor communication on the quality delivery of construction projects.

Tbble 4.5: Influence of Poor	Communicbtion on the	Qublity Delivery	of Construction
Projects			

S/No.	Influence of Poor Communicbtion	MIS	Rbnk	Decision
1	Design errors	4.25	1 st	Significbnt
2	Misbppropribtion of the disbursed fund	3.85	2^{nd}	Significbnt
3	Misunderstbnding of clients requirements	3.85	2^{nd}	Significbnt
4	Mistbkes due to misinterpretbtion of design drbwings	3.85	2^{nd}	Significbnt
5	Wbstbges of bvbilbble resources	3.78	3 rd	Significbnt
6	Chbnge of orders by owner	3.65	4 th	Significbnt
7	Interference of execution of work	3.60	5 th	Significbnt
8	Wrong estimbtions lebding to extrb expenses	3.58	6 th	Significbnt
9	Rework for correcting unsbtisfbctory work	3.53	7^{th}	Significbnt

10	Long chbin of communication channels lebding to slow feedbacks	3.38	8 th	Fbirly significbnt
	Averbge MIS	3.73		

Source: Resebrch dbtb, (2020)

Table 4.5 shows that all the identified influences of communication on quality delivery of construction projects, except the last one, are significant. These range from Design errors (MIS = 4.25) to Rework for correcting unsatisfactory work (MIS = 3.53). On the other hand, Long chain of communication channels leading to slow feedbacks as an influence of communication on quality delivery of construction projects is fairly significant (MIS = 3.38). The average MIS observed was 3.73 indicating that the influences of communication on quality delivery of construction projects are significant.

4.3.4 Results of strategies for improving communication in construction projects

The MIS results of the strategies for improving communication in construction projects is presented in Table 4.6.

S/No.	Strbtegies for Improving Communicbtion	MIS	Rbnk	Decision
1	Hbving b stbndbrd method of communicbting	4.35	1 st	Effective
2	Dbily meetings with tebm members	4.20	2^{nd}	Effective

Tbble 4.6: Strbtegies for Improving Communication in Construction Projects

	Continuation of Table 4.0			
3	Roles of bll pbrties to be clebr bnd distinct	4.18	3 rd	Effective
4	Stbndbrdizing methods of exchbnging project informbtion	4.15	4 th	Effective
5	Ensuring thbt drbwings bre devoid of bmbiguities	4.13	5 th	Effective
6	Engbging in bctive listening	4.08	6 th	Effective
7	Providing b good feedbbck system.	4.05	7 th	Effective
8	Mbximizing use of modern communicbtion technology	3.88	8 th	Effective
9	Avoid communicbtion in b noisy environment	3.65	9 th	Effective
10	Mbking communicbtion gobl oriented	3.48	10^{th}	Fbirly Effective
11	Offering technicbl communicbtion trbining	3.45	11^{th}	Fbirly Effective
12	Using diverse communicbtion chbnnels, listening bnd feedbbck techniques	3.40	12 th	Fbirly Effective
13	The increbsed bwbreness of the potentibl for improving communication	3.20	13 th	Fbirly Effective

Continuation of Table 4.6

	8			55
	Averbge MIS	3.76		Effective
15	blternbtives	5.00	15	Tonry Enective
15	Experiment with communicbtion	3.08	15 th	Ebirly Effective
	trbditionbl method			
14	construction mbnbgement bs bgbinst the	3.08	14^{th}	Fbirly Effective
	Using procurement methods such bs			

Source: Resebrch dbtb, (2020)

Table 4.6 shows that 9 of the 15 identified strategies for improving communication in construction projects are effective. These range from "Having a standard method of communicating" (MIS = 4.35) to "Avoid communication in a noisy environment" (MIS = 3.65). The nine strategies remaining are shown to be fairly effective with MIS ranging between 3.48 (Making communication goal oriented) and 3.08 (Experiment with communication alternatives). The average MIS observed was 3.76 which indicates that the identified strategies for improving communication in construction projects are effective on the average.

4.4Discussion of Findings

This section discusses the results of this study by linking the results to existing literature review.

4.4.1 Questionnbire analysis

This section presents the discussion of results on the questionnaire analysis.

i. The communication channels in use by professionals on construction projects.

This study discovered that, face to face/ oral communication was the most important communication channel used by professionals on construction projects followed by general meetings, written letters and memos. These findings agree with earlier studies made by Amami and Beghini (2016) which stated that although email and certain technological communication toolsare regarded as useful in communication technology, the ability to convey the meaning via body language, cadence and tone are lost, with the potential for content to be misconstrued. For these reasons, Chang *et al.* (2019) and Hua *et al.* (2019) further researched and recommended face to face communication both at project award phase and construction phase.

ii Causes of poor communication on construction projects.

Table 4.2 showed that poor feedback, poor coordination, Unclear communication channels, linguistic barriers and lack of training are the most important causes of poor communication on construction projects. This aligns with what was highlighted byYaser and Abdulrahman (2018) who stated that the main causes were linguistic barriers, unclear communication channels and lack of training.

iii Influence of poor communication management on the cost, time and quality delivery of construction projects.

Table 4.3 showed that wrong estimations leading to extra expenses has the most significant influence on the cost delivery of construction projects and this aligns with Maslej (2016) who stated that project cost can increase due to poor communication between project parties resulting from incomplete or faulty contract documents, misinterpretation of contract documents which could subsequently result in wrong estimations.

Table 4.4 revealed Interference of execution of work as the top ranked influence of poor communication on time delivery of projects which agrees with Dunbar (2016) who stated that many projects have been delayed due to late communication to the execution team thereby making deadlines hard to be met.

Table 4.5 showed that Design errors is the most significant influence of poor communication on quality delivery and this also agrees with Dunbar (2016) who stated that the purpose of a construction specification is to clearly communicate the owners expectations to the contractor in a manner that was fair and equitable he further suggested that well written specifications will result in accurate documents thereby preventing design errors.

iv. Strategies for improving communication in construction projects.

From table 4.6 the strategies for improving communication were identified from several literatures and presented to be prioritized, nine (9) out of fifteen (15) strategies listed were ranked as effective strategies, however the top ranked was; having a standard method of communication which aligns with Zulch (2016)'s view that communication network has to be developed within members of the project team by having a standard method of communication to ensure that the information necessary for decision making gets to where it may be wanted.

4.5 Summary of Findings

The results of the analysis carried out for this study reveal the following:

- Six of the 15 communication channels in use by professionals on construction projects identified are very effective. These range from Face to face/Oral conversations (RII = 0.95) to Maintenance Training (RII = 0.83).
- ii. Five causes of poor communication on construction projects ranging from Poor feedback (RII = 0.89) to Lack of training (RII = 0.82) are very important. Averagely all the identified causes are important (average RII = 0.77).
- iii. "Wrong estimations leading to extra expenses" is the most significant influence of poor communication on the cost delivery of construction projects (MIS = 4.55). On the average, all the identified influences are significant (average MIS = 3.97).
- iv. The identified influences with respect to time delivery are significant. These range from Interference of execution of work (MIS = 4.50) to Design errors (MIS = 3.68).
- v. The identified influences of communication on quality delivery of construction projects, except "Long chain of communication channels leading to slow feedbacks"

(MIS = 3.38; fairly significant), are significant. These range from Design errors (MIS = 4.25) to Rework for correcting unsatisfactory work (MIS = 3.53).

vi. Nine (9) of the 15 identified strategies for improving communication in construction projects are effective. These range from "Having a standard method of communicating" (MIS = 4.35) to "Avoid communication in a noisy environment" (MIS = 3.65). On the average, the strategies for improving communication in construction projects are effective (average MIS = 3.76).

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The research undertook an exploratory quantitative study which used structured questionnaire to collect data from professionals of construction firms registered with the Federation of Construction Industry (FOCI) in Abuja. The use of descriptive methods of analysis was employed to collect data from respondents. Findings from the study led to some vital conclusions towards addressing the problem of poor communication on the delivery of construction projects in Abuja. These conclusions are stated in this section.

The most effectivecommunication channels in use by professionals on construction projects are Face to face/Oral conversations, General meetings, Written letters and memos, Team Discussion, Formal Written documents and Maintenance Training. Poor feedback, Poor coordination,Unclear communication channels, Linguistic barriers and Lack of training are the most important causes of poor communication on construction projects in Abuja. "Wrong estimations leading to extra expenses" is the most significant influence of poor communication on the cost delivery of construction projects in Abuja. All the identified influences of poor communication on time delivery of construction projects are significant. These range from Interference of execution of work to Design errors. The identified influences of poor communication on the quality delivery of construction projects are significant. The identified strategies for improving communication in construction projects in Abuja are effective.

In conclusion, the implication of the study is that ineffective communication has negative impact on project delivery. Therefore effective communication should becarried out all through the life cycle of the construction process which will lead to a positive outcome of the objectives of the project and the importance of these will further improve on: contractual relationship skill, payment and award skill, planning, scheduling of project delivery within budgeted time and cost, productivity of construction materials and machine, health and safety communication and records.

5.2 **Recommendations**

Based on the findings and conclusions of this study, the following recommendations were made:

- Project managers should employ the use of the most effective communication channels to minimise potential dispute, misunderstanding and project failures as a result of poor management of communication on project sites.
- ii. Professionals should pay more attention to the communication issues that will hamper project delivery and such communication issues are mostly as a result of wrong dissemination of information among building professionals leading to wrong estimations, interference of execution of work and design errors. All these could be handled if the right information is passed through the most effective channel of communication.
- iii. Professionals should ensure that the means and mode of communication on differing projects are stated and agreed upon by contractual parties at procurement phases, upward, downward and lateral communication channel should be encouraged and used effectively.

5.3 Contribution to Knowledge

Communication problems have drastically triggered contractual problems like: litigation, arbitration, damages, conflicts, unwillingness to communicate are the order of the day therefore this study has contributed in the following areas:

i. It has created an awareness to curb the social implication in the society and also at construction workplaces world over and also increased the understanding on how communication can be managed on construction projects.

ii. Also the sensitization of project communication importance write up on construction industry in Abuja, Nigeria would assist the stakeholders in the construction industry to avoid unwillingness to communicate that often trigger other communication problems.

iii. This study has added to the existing body of knowledge of the gap on how ineffective communication affects project delivery in terms of quality, cost and time and has also proposed strategies necessary for a successful project delivery.

5.4 Areas for Further Studies

Possible areas for further investigation can be directed into

- i. Communication trend in project management
- ii. Assessment of effective communication channel among project management
- iii. Assessment of effective communication system selective construction company.

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APPENDICES

APPENDIX A: Questionnaire Sample COVERING LETTER ON QUESTIONNAIRE SURVEY

Department of Quantity Surveying Federal University of Technology, Minna – Nigeria Date: -----

Dear Sir/Madam,

Research on: IMPACT OF INEFFECTIVE COMMUNICATION ON THE DELIVERY OF CONSTRUCTION PROJECTS IN ABUJA, NIGERIA

I wish to request you to contribute to an M. Tech. research, which aims at assessing the impact of communication on the delivery of construction projects in Abuja, with a view to proporsing strategies to improving communication in construction projects. The research is being carried out at the Department of Quantity Surveying, Federal University of Technology, Minna – Nigeria under the supervision of Dr. A. A. Shittu.

As part of this research, a survey is conducted to achieve the following objectives:

- i. To identify and examine the various communication channels in use by professionals on construction projects in Abuja, Nigeria.
- ii. To identify and ascertain the causes of poor communication on construction projects in Abuja, Nigeria.

- iii. To determine the influence of poor communication on the cost, time and quality delivery of construction projects in Abuja, Nigeria.
- iv. To propose strategies for improving communication in construction projects.

It would be greatly appreciated if you would fill the questionnaire as soon as possible. I want you to also note that

your responses will be treated confidentially.

Thanks.

Yours faithfully,

EVBOROKHAI, Mercy Oiseruimen MTECH/SET/2018/2019/8280 (Researcher) Tel: 09031639188 Email: royevborokhai@gmail.com

Department of Quantity Surveying Federal University of Technology Minna – Nigeria

QUESTIONNAIRE SURVEY

IMPACT OF INEFFECTIVE COMMUNICATION ON THE DELIVERY OF CONSTRUCTION PROJECTS IN ABUJA, NIGERIA

SECTION A: General Information of Respondents

Please enter your name, position and the details of your organisation.

All responses will be confidential and will not be connected in any way to yourself or your organis	sation.
Name (Optional):	
Profession:	
Organisation:	
Years of Experience:	
Telephone:	
Postal Address:	
Email:	

SECTION B: Communication Channels in Use by Professionals on Construction Projects

Q1: The study has identified the following as the various communication channels in use by professionals on construction projects. Please indicate by ticking in the blank spaces provided in the table below, the level of effectiveness of these communication channels to the delivery of construction projects based on your perception on a five-point scale in your opinion.

S/No.	Communication Channels	5 Very Effective	4 Effective	3 Fairly Effective	2 Less Effective	1 Not Effective
1	Face to face/Oral conversations					
2	Video conferencing					

3	Audio conferencing			
4	Written letters and memos			
5	Chats and messaging			
6	Web site and blogs			
7	Notice board			
8	General meetings			
9	Employee manual			
10	Customer complaint system			
11	Public relations			
12	Formal Written documents			
13	Spread sheets			
14	Team Discussion			
15	Maintenance Training			

SECTION C: Causes of Poor Communication on Construction Projects

Q2: The study has identified the following as the causes of poor communication on construction projects. Please indicate by ticking in the blank spaces provided in the table below, the impact of these causes in order of significance on project delivery on a five-point scale in your opinion.

S/No.	Causes of Poor Communication	5 Very Significant	4 Significant	3 Fairly Significant	2 Less Significant	1 Not Significant
1	Linguistic barriers					
2	Cultural barriers					
3	Unclear communication channels					
4	Poor feedback					
5	Work pressure					
6	Poor coordination					
7	Difference in objectives					
8	Lack of training					
9	Lack of knowledge					
10	Different level of education					
11	Difference in experience					
12	Unclear responsibilities					
13	Unconscious message distortion					
14	Conscious message distortion					
15	The noise produced on site causing difficulty to hear each other clearly					

SECTION D: Influence of Poor Communication on the Cost, Time and Quality Delivery of Construction Projects

Q3: The following are the identified influences of ineffective communication on the cost, time and quality delivery of construction projects in the construction industry. Please indicate by ticking in the blank spaces provided in the table below the level of significance of each these influences on each of these delivery parameters in your opinion on a five-point scale.

5	4	3	2	1
Very	Significant	Fairly	Less	Not
Significant		Significant	Significant	Significant

Influenceof Poor	Cost Delivery				Time Delivery				Quality Delivery						
Communication on Project Delivery	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1
(1) Wastages of available resources															
(2) Wrong estimations leading to extra expenses															

(3) Misappropriation of the disbursed fund								
(4) Interference of execution of work								
(5) Long chain of communication channels leading to slow feedbacks								
(6) Rework for correcting unsatisfactory work								
(7) Change of orders by owner								
(8) Misunderstanding of clients requirements								
(9) Design errors								
(10) Mistakes due to misinterpretation of design drawings								

SECTION E: Strategies for Improving Communication in Construction Projects

Q4: The following are the identified strategies for improving communication in construction projects. Please indicate by ticking in the blank spaces provided in the Table below the level of effectiveness of these strategies in your opinion on a five-point scale.

S/No.	Strategies	5 Most Effective	4 Very Effective	3 Effective	2 Less Effective	1 Not Effective
1	Daily meetings with team members					
2	Engaging in active listening					
3	Providing a good feedback system.					
4	Having a standard method of communicating					
5	Ensuring that drawings are devoid of ambiguities					
6	Standardizing methods of exchanging project information					
7	Maximizing use of modern communication technology					
8	Roles of all parties to be clear and distinct					
9	Using procurement methods such as construction management as against the traditional method					

10	Offering technical communication training			
11	Avoid communication in a noisy environment			
12	The increased awareness of the potential for improving communication			
13	Making communication goal oriented			
14	Experiment with communication alternatives			
15	Using diverse communication channels, listening and feedback techniques			

Thank you very much for your co-operation.

For further enquiries please contact: EVBOROKHAI, Mercy Oiseruimen (Researcher) MTECH/SET/2018/2019/8280 Department of Quantity Surveying Federal University of Technology, Minna - Nigeria. Tel: +2349031639188 Email: royevborokhai@gmail.com

APPENDIX B: FOCI List of Abuja Contractors

https://foci.org.ng/full-members/

S/N	NAME OF	STREET	CITY	PHONE NO	EMAIL
	COMPANY	ADDRESS			
1	B. Stabilini &	Plot 3032	Abuio		
	Company Limited		Abuja		
2	BNL Eng. & Constr.	Plots 564/565	P.O. Box		info@bouygues-
	Limited	Block D Central	1669,		construction.com
		Area	Garki		
3	Bulet International	CBD,		+234 (0) 98707414	
	Nigeria Limited	Plot P.M.B.			
		4, 2567,			info@buletng.com
		Garki			
4	Dumez Nigeria	Plot 3120,		+234 803 400 70	contact@dumeznigeria.
	Limited	Rima Street		70	com
			Maitama,		

5	Dantata & Sawoe Construction Co. Nig. Ltd.	Nnamdi Azikiwe Way	Garki	+234-(0)9-33 00 000	<u>info@dantata-</u> <u>sawoe.com</u>
6	Gilmor Engineering Nigeria Ltd	No. 69 Usuma Street	P.O. Box 8841, Wuse,	080-55880001	<u>gilmor@gilmornig.co</u> <u>m</u>
7	Gitto Costruzioni Generali Nig. Ltd	Plot 737, Mabushi	Mabu shi	234-(0)95242380	<u>abuja@gittonigeria.co</u> <u>m</u>
8	HAJAIG Const. Nig. Ltd. HAJAIG Const. Nig. Ltd.	No. 11, Vaal Street, No. 11, Vaal Street,	Maitam a, Maitam a,	070-61971781 070-61971781	paul_bnigeria@yahoo. com paul_bnigeria@yahoo. com
9	Paul-B Nigeria PLC	51, Parako u Street	Abuja	0806811489 7	
10	P.W. Nigeria Limited	Plot 09, Outer Northern Expressway	P.M.B. 7016, Garki	0813 989 0080	pw@pwnigeria.com
11	PICCOLO-Brunneli Engineering Ltd.	23, Danube Street,	Maintama District		
12	R.C.C. Nigeria Limited	No. 28, Ebitu Ukiwe Street	P.M. Box 5059, Jabi,	234-8054090165-7	md@rccnigeria.com
13	Sageto Limited	Plot 64 Nouakchott Street	G.P.O. 4261, Abuja	+234) 08036100900	info@sagetolimited.com
14	Salini Nigeria Limited	Plot16BlantyreStreetP.O. Box 7558,	Wuse	+234 09 5238428	<u>abuja@salini-</u> impregilo.com
15	S & M Nigeria Limited	Plot BDEX/CP/292 , Opp. Abuja Model City	P.O. Box 5820 Garki	+234 815 973 2153	
16	Structural Skyline Limited	Suite D9, 3rd Floor, SHM Complex,	Mabushi		
17	Standard Construction Limited	Plot 766 Mabushi	Mabu shi,		standardconltd@yahoo .com
18	S.C.C. Nigeria Limited	Plot 741 Cadastral Zone B4,	Jabi District, P.O. Box 4486, Garki	08039043000	abuja@sccnig.com

19	Setraco Nigeria Limited	Setraco Building, Plot	P.M.B. 105, Garki,	+234-806-9447441	info@setraco.net
		Yar'adua Way,			
20					
21	Zeberced Limited	Off Gbazango Road,	Kubwa,	08155149898	info@zeberced.com
22	Greenville Oil &	45B, T.Y.	Asokoro	+234	sales@greengaslng.co
	Gas Company Ltd	Danjuma Street		9062460009	<u>m</u>
23	Ringardas Nig. Ltd.	49, Mamman	Asokoro,	0703 417 1368	info@ascanigeria.com
		Nasir Street			
24	A & A	Suite No. 2	Asokoro	+234 9 3142146	
	YawasInternational	Aguyi Ironsi			
	Limited	Complex			
25	Afro Dimensions	Suite A12,	Maitama	+234 9 4130779,	
	Co. Limited	Bensima		4130780	
		House, Plot			
		2942, Aguyi			
		Ironsi Street			