THE CONSTRUCTION INDUSTRY OF GHANA: EXPLORING THE NEXUS BETWEEN COMMUNICATION AND PROJECT DELIVERY(ACTIVITIES); A CASE STUDY ON THE ROAD SECTOR (ACCRA)

By

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MASTER OF SCIENCE IN PROJECT MANAGEMENT

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgement is made in the thesis.

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ABSTARCT

Communication is the exchange of information with the emphasis on creating understanding between the sender and the receiver. All project Participants prepare information in a variety of ways to meet the needs of project stakeholders. Team members also receive feedback from these stakeholders.

However, the purpose of this study is to assess the relationship between communication and project delivery and its objectives are to determine the various communication channels employed by project professionals within the road sector in Accra, to identify the communication barriers affecting project delivery, to assess the perceived impact of project communication on project delivery. The study introduction offers the overview of the construction industry. Followed by the literature which review the overview of the construction industry in Ghana, the concept of Communication and gives an outline of the road sector in Accra. The main three (3) agencies and departments under the Ministry of Roads and Highways which includes the Department of Feeder roads, Department of Urban roads were carefully chosen to be the case studies for this research. The mixed method, which includes open and closed questionnaire, were used to collect data from construction professionals. SPSS was used for the analysis respectively. After the discussion was made, there was a complete relationship established among responses received. This study draws attention of project companies to take interest to develop communication skills of all their project professionals, since communication stand as a strong backbone in project delivery. In conclusion, communication among project professionals is necessary for project delivery.

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ACKNOWLEDGEMENT

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DEDICATION

I wholeheartedly dedicate this research work to the Lord Almighty through whose guidance and protection I have been able to reach this far in my education. I cannot end this work without mentioning the people who give meaning to my life, my mum Miss Angela Okine, my friend: Gideon Addison, and my mentors; Mr Richmond Kodua and Miss Theodora.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

In recent times, people have come to appreciate the significance to practice good communication in the society in order to successfully deliver meaningful communication.

The Construction Industry is a fragmented and dynamic sector with a project-based nature. The distinctiveness of the construction Industry forms a complex communication environment. In respect to this, a lot of stakeholder's work repeatedly wavering sets of relationships which are contractually driven. The culture presents a reality of conflicts and lack of reciprocal respect and trust (Dainty *et al.* 2006). Consequently, this has undoubtedly resulted in expensive delays in the successful performance of construction projects (Weippert *et al*., (2003). Communication is practiced in various forms and in different ways by different people at a particular time within a confined environment or organisation. The same way construction participants have their own way of communicating among themselves when embarking on projects, but hence, there has always been an issue regarding communication. This is because communication is being practiced by different people at a particular time. Consequently, this problem has hindered the flow of communication from one employee to the other leading to delay in project delivery. And has also made directing, organising, and managing very difficult.

For the purpose of this study, "communication is defined as the exchange and flow of information from a sender to a receiver via a channel/Medium". Communication plays a vigorous role in all stages of construction such as design, production, organization and management. Information must be properly managed, transferred and understood so that the various aspects of the project can be assembled to realize the design. Hence, this study aims at exploring the link between communication practices and project delivery in the road sector. "In Ghana, the construction professionals who are regularly engaged in the industry are

Architects, Quantity Surveyors (QS), Geodetic Engineers (GE), Structural Engineers (St.E), Electrical Engineers (EE) and Services Engineers (SE). These entire professionals are regulated by their professional institution, namely, Ghana Institute of Architects (GIA), Ghana Institution of Surveyors (GhIS) for the QS and GE and Ghana institution of Engineers (GhIE) for the Engineers".

1.2 PROBLEM STATEMENT

In enhancing project delivery, the construction industry has over the years evolved from the traditional design/build and the design/bid/build delivery systems to an Integrated Project Delivery System that requires architects, contractors, clients and all stakeholders in the industry to take on new roles and skills (Renault, (2016).

Utmost construction professionals are conscious that communication in construction projects is really a problem and leads to a lot of delays and less quality project delivery. Hence a lot of construction industries are putting more effort to minimize or solve the issue of poor communication flow among project professionals within the industry.

Unfortunately, all these effort has proven false whiles the industry is still faced with this challenge. In embarking on project, project participants are very important aspect of project delivery and normally communication is based on the individual roles and positions. Also, communication practiced is not only based on formal principles between project participants. but also tasked on local business practices, informal channels of interaction between project participants such as building trust and maintaining control in organizational hierarchies, technologies employed for that purpose and many other factors.

"Given those issues of wideness and complication, many companies adopt various formal frameworks to establish certain roles and responsibilities in their projects to achieve more efficient mechanisms of communication in projects delivery".

Therefore, this quantitative case study seeks to discover perceptions of project participants about the various communication practices employed during road construction and the impact of this form of communication practice on project delivery.

1.3 RESEARCH AIM

This research aimed to assess the link between project communication and project delivery within the road sector.

1.4 RESEARCH OBJECTIVES

Specific objectives

1. To determine the various communication channels employed by project professionals within the road sector in Accra.
2. To identify the communication barriers affecting project delivery
3. To assess the perceived impact of project communication on project delivery.

1.5 RESEARCH QUESTIONS

Specific Questions

1.What are the various forms of communication channel employed in the road sector?

2. What are the various communication barriers on project delivery?

3.To what extent does project communication has an impact on project delivery.

1.6 SCOPE OF THE STUDY

This study was focused on the Road Sector by the Ministry of Roads and Highways especially the department and agencies that operate under the direct ambit of the Ministry, which includes:

i. Ghana Highway Authority(GHA)

ii. Department of feeder Roads(DFR)

iii. Department of Urban Roads (DUR)

The list of project participants was taken from these departments and agencies. The Ghana Highway Authority, The Department of Feeder Roads and The Department of Urban Roads which are rightfully located in the Accra metropolis and are charged with the responsibility for the administration, planning, control development, and maintenance of trunk roads, feeder roads and urban roads respectively in the country. The study was limited to identifying the link between communication and project delivery in the road sector precisely the Greater Accra Region.

1.7 METHODOLOGY

In carrying out this research, mixed method is employed and therefore both an open and closed questionnaire survey was used in collecting data from respondents. The respondent's selection was only limited to Construction professionals which includes of Quantity Surveyors, Project Managers, Architects and Engineers respectively. These professionals were selected purposely because they are well equipped in terms of skills and experience in road construction. A structured questionnaire was administered to these professionals of the Road Agencies and department. Analysis of the gathered data was done with the help of Statistical Package for Social Sciences (SPSS) computer software and the Likert Scale. This helped to evaluate and analyse the results, from which conclusions and recommendations were done.

1.8 SIGNIFICANCE OF THE STUDY

The Study seeks to offer immense benefits to all institution in road contraction relation activities, road contractors to appreciate the positive and negative outcomes between project communication and project delivery. Also the findings of this research guides various

agencies departments, consultants and contractors in general; and this will acquaint them with the necessary ways by which project communication strategies leads to project deliverables.

The research also provides the general public with information on the communication strategies employed by the road sector and also the various departments and agencies in charge of road administration.

Finally, it will contribute to the literature on project communication and project delivery. And also serve as a reference for further research. A researcher who wants to research further into this area will see this material as a useful source of reference.

1.9 STRUCTURE OF THE RESEARCH

The study had five distinctive chapters.

Chapter One: Contains the background of the study, problem statement, aim and objectives together with the research questions

Chapter Two: Provides an outlook regarding reviewed literature on the construction industry

Chapter Three: Provides information on the methodology, research approach, unit of analysis and data sources, population and sample size consideration, sampling technique, data collection procedures, and data processing and analysis.

Chapter Four: Provides findings and the discussion on the findings of the study.

Chapter Five: Provides summary of the findings, conclusion and recommendation to the industry players and for further research.

SUMMARY OF CHAPTER ONE

The introductory to this chapter gives a brief summary of the background of this research, it elaborates on the concept of construction as whole and points out some major problems in the construction industry, it also mentioned some construction professionals in its discussion and goes on further to define communication, as the exchange and flow of information from sender to a receiver via a channel or medium. This chapter also contains the problem

statement, thus a concise description of an issue to be addressed. It identified the gap between the current state of the communication in the construction industry precisely the road sector. This chapter also included the research aim, which is to assess the link between project communication and project delivery within the road sector, it also clearly states the objectives of the research which is to determine the various communication channels employed by project professionals within the road sector in Accra, identify the communication barriers affecting project delivery, and also to assess the perceived impact of project communication on project delivery. It moves on further to talk about the scope of the study which was the three main agencies and departments under the Ministry of roads and Highways which includes the Ghana Highway Authority, Department of Feeder Roads, and Department of Urban roads. It also discussed the methodology, which is the systematic and theoretical analysis of the methods applied to the field of study. The method employed to analyse the research was the mixed method which involves both the quantitative and qualitative method, and a survey questionnaire to collect data from respondents, and also the use of the SPSS software to help in evaluating and analysing results from which conclusions and recommendations are done. The chapter also mentions the significance of the study, which one major importance of this research is to establish the relationship between project communication and project delivery and also spells out the positive and negative outcomes of these two. The chapter also includes the Structure of the research, which outlined the entire work and what is expected under each chapter of the research work.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews and give an account on all existing literatures concerning the construction industry in Ghana, Concept of communication and the Road Sector in Accra

2.2 THE OVERVIEW OF THE GHANAIAN CONSTRUCTION INDUSTRY

"The Ghanaian construction industry is complex in nature, representing a range of stakeholders" (Dadzie et al. (2012,). It comprises of building project consultants, engineers, architects, quantity surveyors, building contractors, artisans, and some government actors in the construction sector. The Ministry of Works and Housing supervises all building and civil works in the country while the Ministry of Roads and Highways oversees the activities of players in the construction and maintenance of roads, highways, railways, airports, and other structures Vulink (2004). The two (2) ministries are therefore jointly responsible for the registration and classification of contractors within the industry, which is primarily based on the financial resources, human resource capacities, and level of technology Vulink (2004) (i.e. type and efficiency of equipment employed) of firms. The classifications for contractors in the housing and roads subsectors are described below.

"Contractors in the housing subsector are grouped into four classifications, 1 to 4, depending on the value of the project to be implemented. As described in Table 1, class 1 contractors (D1K1) are contractors with the capacity to execute projects that are above US$500,000 in value; class 2 contractors (D2K2) have the capacity to execute projects that are up to a value of $500,000; class 3 (D3K3) contractors have the resources to implement projects with a maximum value of $200,000; while class 4 (D4K4) contractors have the means to carry out projects with a maximum value of $75,000" (Oxford Business Group, 2014).

Table 2.1: The Overview of The Ghanaian Construction Industry

Classification Class	Project Value	Proportion of contractors
Class 1 (D1KI)	$500,000	19%
Class 2 (D2K2)	$500,000	20%
Class 3 (D3K3)	$200,000	60%
Class 4 (D4K4)	$75,000	10%

According to the Ministry of Works and Housing, the majority (roughly 60 per cent) of contractors in Ghana fall within the class 3 category, while only about 10 and 20 per cent fall within the first two categories, respectively. The remainder fall within the fourth classification.

These classifications have direct implications for the types of projects that contractors within the sector can bid for, with varying degrees of competition from one classification to the other. Given the relatively lower concentration of contractors in class 1, the level of competition in this class appears to be more oligopolistic in nature. The level of competition in the class 3 category, however, where more contractors are concentrated, appears to be more competitive (Ministry of Works and Housing, 2018)

Consequently, there is currently no national authority that governs and regulates the activities of the industry. "Although many qualified engineers, technicians and architects lead construction projects in Ghana, there is no overarching regulatory body, and there are few legal mandates or enforcement mechanisms are currently in place for the industry"

"Even thou a lot of suggestions has been made from several gurus in the industry such as the Association of Building and Civil Engineering Contractors of Ghana, concerning the establishment of a steadfast regulatory body which will stand as the major institution to

embark on all the major decisions concerning the industry and also to ensure safety and increase professionalism in the industry Hildebrandt (1985).

The Ghanaian government started exploring the option of establishing a Construction Industry Development Authority in 2014 but had not made significant progress as of late 2016.Nonetheless, Contractors are registered after all relevant resource requirements have been fully met. There are perceptions however that the registration requirements are not strictly followed, which allows prospective contractors without the requisite resource capacity to be registered for any of the financial classes. Contractors without proven resource capacity may thus manage to win large projects. This is a significant contributor to the problems which plague the Ghanaian construction industry.

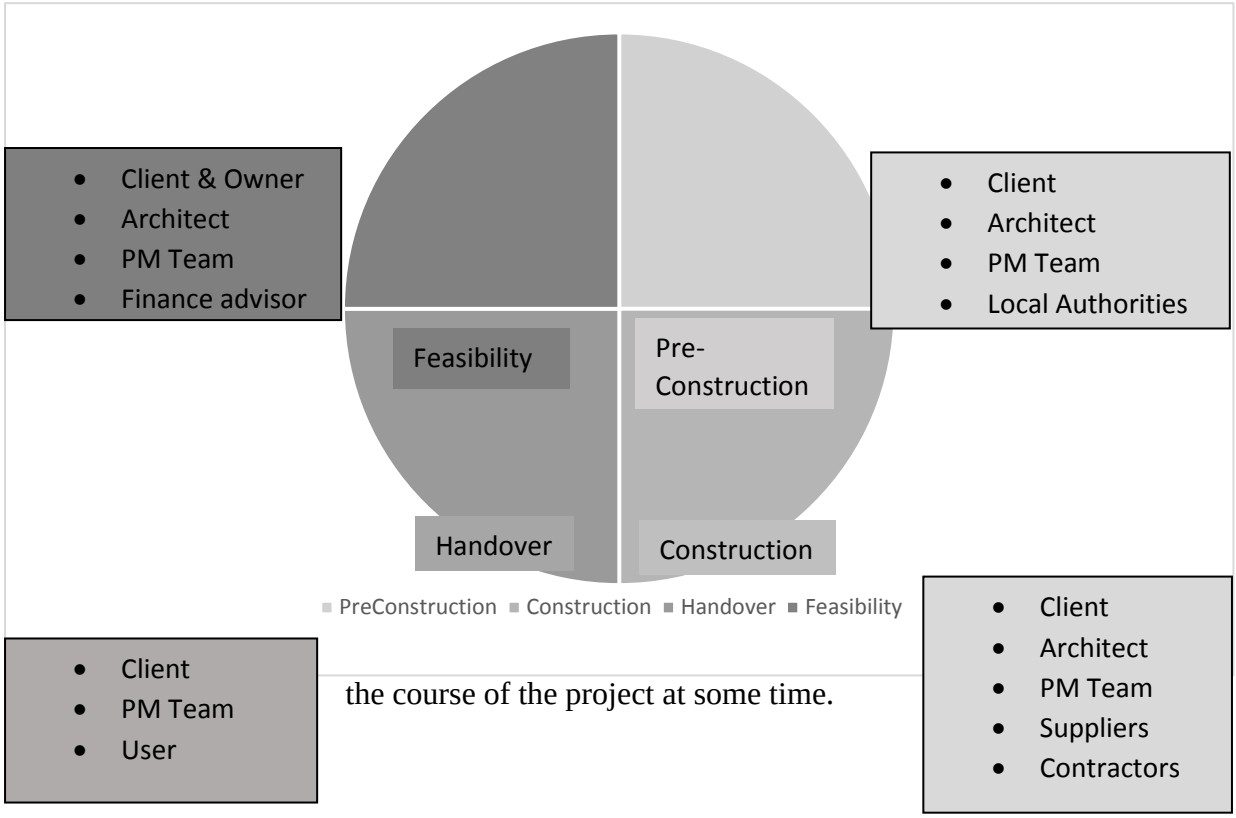
2.3 PROJECT STAKEHOLDERS

According to Project Management Institute (2001), "individuals and organizations who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion." Furthermore, a concise definition of the stakeholders would be, "those groups or individuals with whom the organization interacts or has interdependencies. Any individual or group who can affect or is affected by the actions, decisions, policies, practices or goals of the organization. (Carroll,1993).

The stakeholder in a project can be divided into two (2) which includes Internal Stakeholders to the organization, who are the team members of the project or those who provide for the financing of it. External Stakeholders like the people affected by the project in some significant way. (Winch and Bonke, 2002).

Construction stakeholders involves the owners and facility users, project management, team members, facilities managers, designers, shareholders, public administration, workers,

subcontractors, services supplier's competitors, banks insurance companies, media, community representative, neighbours, general public, clients, regional development agencies. (Winch and Bonke 2002). Each one of these stake holders has a great influence in



the course of the project at some time.

Figure 2.1 Project Life Cycle and Stakeholder Involvement

2.4 CONCEPT OF COMMUNICATION

According to (Lulengurd, 2010) "The word "communication" has been derived from the Latin word "communis," which means "common. "Thus "to communicate" means "to make common" or "to make known", "to share".

Communication is the process of transmitting information and common understanding from one person to another (Keyton, 2001). In other words, communication is the act whereby a sender gives information to a receiver and then the receiver sends a feedback to the sender to indicate a mutual agreement between the two.

Nonetheless, communication is a multidimensional process which becomes difficult to have only one definition for since it is understood by different people at different place of time based on the concept which is been transmitted.

"Communication usually involves the transfer of information, a generic term that embraces meanings such as knowledge, processed data, skills and technology" (Cheng et al., 2001).

- According to (Skyttner, 1998). "To communicate is to bridge a distance of some description, which can range from being short and simple (e.g. between two people) to long and complex (e.g. across the world)" Also, construction communication is bent on travelling to far distances since project participants may not reside at one place, or may be shortly transferred when all participants are working under one department.
- "Successful communication (at an interpersonal level in any case) is a social skill involving the effective interaction between people" (Hargie, 1986). Construction of projects involves a lot of people and requires communication among a widespread project professional.
- According to Kakabadase, (1988) "Interpersonal communications between people usually involve conveying facts, feelings, values and opinions". Hence, communications within the construction industry is normally requires construction professionals to be subjective.
- "Communications do not only occur between individuals but can occur between groups or organisations" (Baguley, 1994). Construction naturally involves a team work which requires some form of speciality to attain their set goal.
- "Communication can be seen as a transactional process where something is exchanged between the parties involved" (Eisenberg and Goodall, 1993). In Construction there are series of transactions that place between the parties involved. Smoothing these transactions has become a huge problem for the industry and hence needs to be addressed to prevent further occurrence in the future.

"Based on these comprehensive perspectives on communication all suggest that communication is essentially about the transfer of information between people." Hence, communication is the transfer of a sender's information and wishes the other person receive it. (or team or organisation etc.) (Dainty et al 2006)

2.7.1 Types of communication in an organisation

Understanding communication on construction sites requires an understanding of organisational behaviour of a team. Earlier researchers have studied communication within organisations and classified them into various type. Kreps (1989) cited in Liu (2009), divided communication into four types: intrapersonal communication, interpersonal communication, small group communications and Multi-group communication. This is illustrated below:

Table 2.2: Types of Communication

Procedure	Number of people involved
Intrapersonal Communication: Is the ability of a person to process information received to one's own understanding and to be able to see to it that this information can be transmitted and understood by others as well.	Intrapersonal communication is normally not considered as a communication process since It is administered by an individual and usually used when a unilateral decision is made. Since communication is said to be successful only when two people are involved, most authors does not consider.
Interpersonal communication It is administered between two people who involves in communicating. It is the transfer of messages and signals between the parties. Both intrapersonal and interpersonal communication helps information to be	This normally involves two people where there are more than two people, it is mostly considered to be group. Interpersonal communication is differentiated from group. There can however be differences in the nature of the interactions.

processed in order to achieve a desirable decision.	
Group Communication This involves mainly groups (more than two people). The message may be conveyed in a way that addresses the entire group or persons within the group.	Involves more than two people but restricted to a single group of people. Individuals or the whole group may be addressed by the communicator.
Multi-group communication In multi-group communication, the message is communicated to a number of groups or subgroups by either a person or a group. Different responses may be given to the message based on the culture and norms of the groups.	It involves two or more groups and sub groups.

QuEmmit and Gorse, 2003 Cited in Liu, 2009).

2.7.3 Elements in Communication

Communication is the act of giving, receiving or exchanging information, ideas and opinions among two or more persons with the wish of all parties understanding the message been transmitted.

Figure 2.2 below shows clearly that in a communication process, there must be a sender who speaks or sends a message, and a receiver who listens or receives the message.

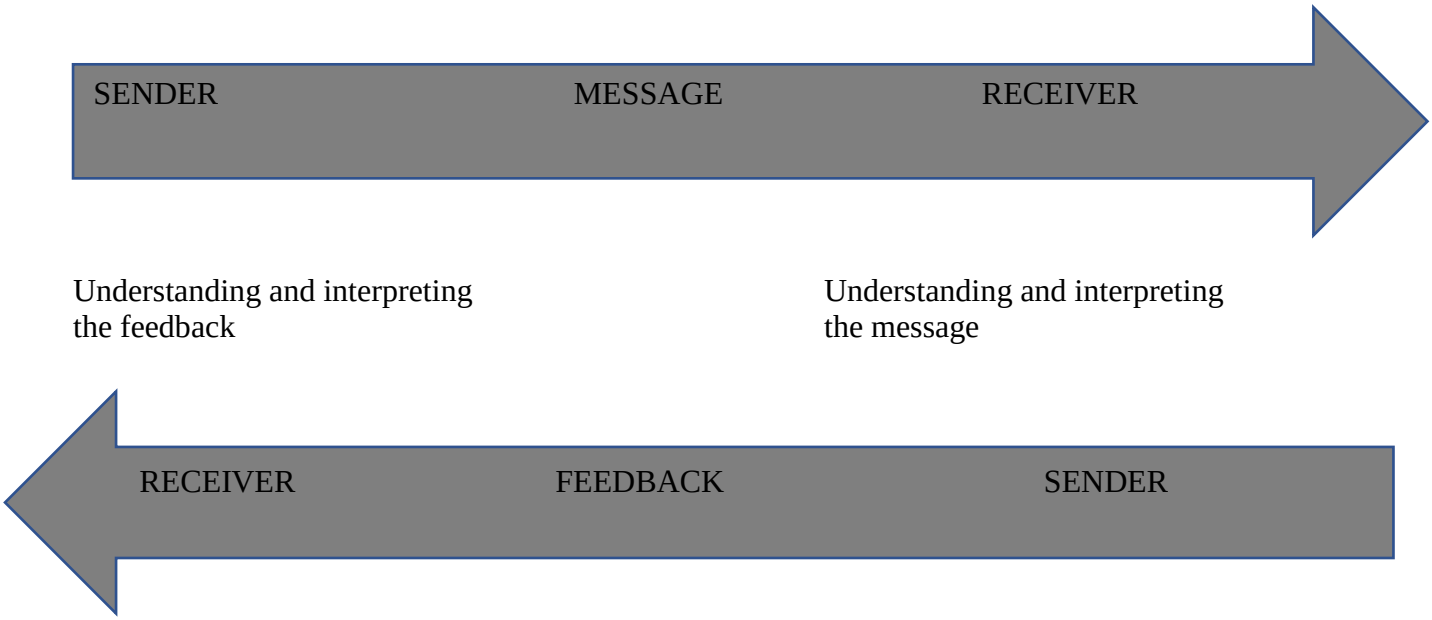


Figure 2.2: The communication process

Source: Introduction to Communication, 2019

From the above diagram there are two people involved in the communication process which is the sender and receiver.

Sender: Is the person who send a message or information to the receiver with the hope of the receiver understanding it and sending feedback.

Receiver: Is the one who also process this information gathered by receiver and then interprets it to his understanding and after that sends a feedback to the sender.

This constant process constitutes communication, which involves elements a sender, message, channel, receiver, feedback, context. There is both a speaker intention to convey a message and a listener's reception of what has been said.

2.7.4 Characteristics of Communication

Mehra (2009) outlines some characteristics of communication which involves:

- Communication as a process which is a non-stop process, ongoing, and dynamic.
- It involves a sender and a receiver
- It is an information carrier (message/content)
- It is channelled through a process or a medium example as illustration of symbols, and signs as well as behaviour of people, speech, writing, or signals)

2.7.5 Communication Methods

According to (Kotze et al. (2007). "There are numerous methods and processes through which professionals in the construction industry communicate effectively. Usually, during the course of a project, the project manager takes responsibility for the organisation and provision of information for all other professionals associated with the project. Thus, the project manager sees to all the directives from the various stakeholders concerning the project.

As quoted by Burke (2003), "As part of these responsibilities, there is a requirement to develop a communication plan so that it is clear to all what channels must be used and which professionals can be contacted, and at what times".

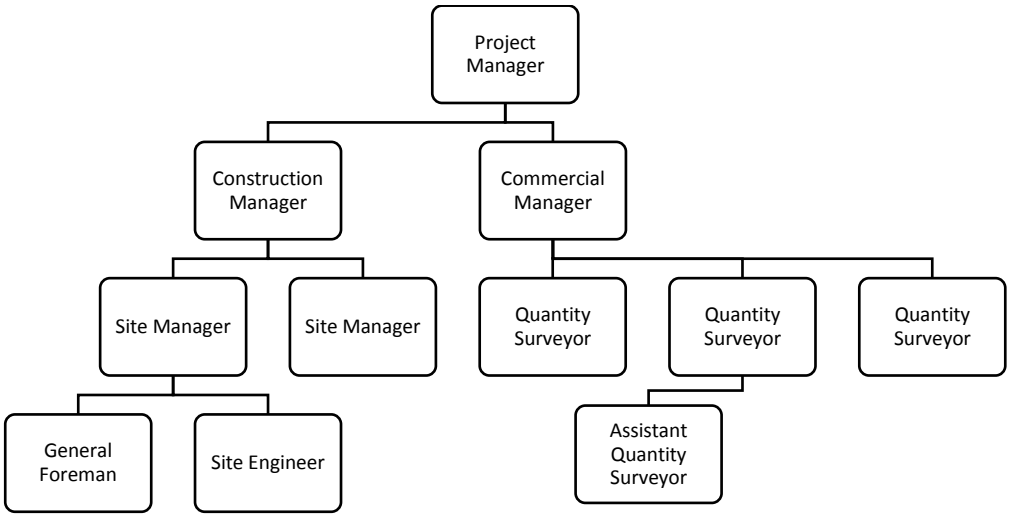


Figure 2.3: Communication Line-up Among Professionals In a construction project

Source: Dainty et al. (2006)

This edifice gives us a faire idea of the process of communication on a project which involves.

Oral Communication: This type of communication is normally channelled through messages, face to- face discussions, telephone, presentations, meetings and others.

Written Communication: This process of communication is also channelled through sending of emails, letters, fax, memos, plans, legal documents, reports, and others.

Nonverbal Communication: This process of communication is conducted through gestures, appearance or attitudes"

According to Knipe, 2002 also describes another form of communication which is the '*Electronic Communication*'. Here, Communication channels involve the use of formal letters, calculations, telephone calls, reports, presentations and contracts. Each activity in the process requires the sort of activity required. Normally, during the tendering stages formal letters and the rest are needed in order for the contractor to win the contract. Other instances would be through visits on a construction site, by way of sending letters concerning health and safety, and other times by word of mouth.

According to (Chen and Kamara, 2008; CITB Construction Skills; Bowden et al., 2004). "Verbal communication through mediums such as two way radios would facilitate the movement of materials using heavy machinery. The presentation and explanation of certain construction details would be given via drawings and reports" (The American Institute of Architects, 2008). Also states that "In the case of a designer or architect, communication is predominantly carried out through the process of visual representations via drawings; however other forms of communication are necessary to fully convey such messages to others"

2.7.6 Communication model

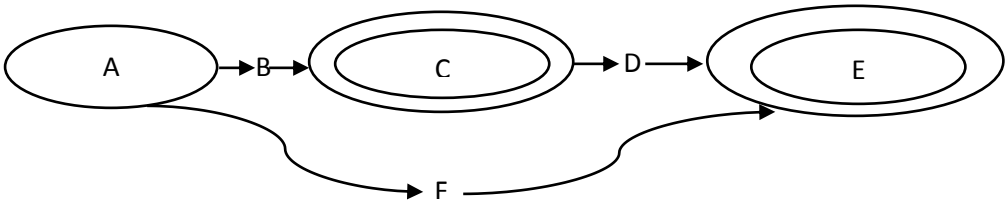


Figure 2.4: Communication model

Source : McQuail and Windahl (1989)

Introduction of the model

"Models," wrote McQuail and Windahl (1989), model select key elements, simplifies reality and indicate relationships". Westley's and MacLeans's (1989) conceptual model of mass communication. is a simplified as shown above:

i. The event or object

The letter A represents an event or object. The ring encompassing the letter indicates that the essence of the event or object is naturally undetectable to the sender, lying deep beneath the surface appearances. Colson (1989) gave us a sense of this submerged meaning when he quoted Matthew Arnold: "Below the surface-stream, shallow and light ... there flows with noiseless current strong, obscure and deep, the central stream of what we are indeed" (p. 124). This idea, a Platonic one in that the perceivable object is merely a shadow of the Form of the object, is summed up by Saint-Exupéry (1971): "What is essential is invisible to the eye".

ii. A transmission

Letter B illustrates the transmission channel in which information is being transmitted to the observer. This is maybe done through visually or aurally.

iii. The sender

The letter Object A or sender is the one who sends information across. The outer ring which is indicated by C represents the passage area of the information regarding the event or object must pass. This includes the senses of seeing, hearing, smelling, touching, and tasting.

The moment the information is passes it is "decoded": compared with previously received impressions and its significance interpreted.

Another transmission

." Sender C must arrange the information properly to be understood by the receiver and make sense out of it. Information passes through the two rings before it is detected by the receiver. The letter D represents the means by which the information in the sender reaches the audience or "destination

iv. The receiver

The letter E represents the receiver — "any person or thing that takes in messages" (DeVito, 1986,).

The letter F, indicates the channel through which the receiver might receive that information.

2.7.7 Communication Channel

According to Mehra, 2009 communication is normally occurring in different directions. Depending on who is communicating, which could involve upward channel which be from the top communication to management within an organization to the customers of the same organization. And could also take place from the lower level from customers to the top management. Various guidelines or channels need to be put in place for the flow of communication.

Communication Channels

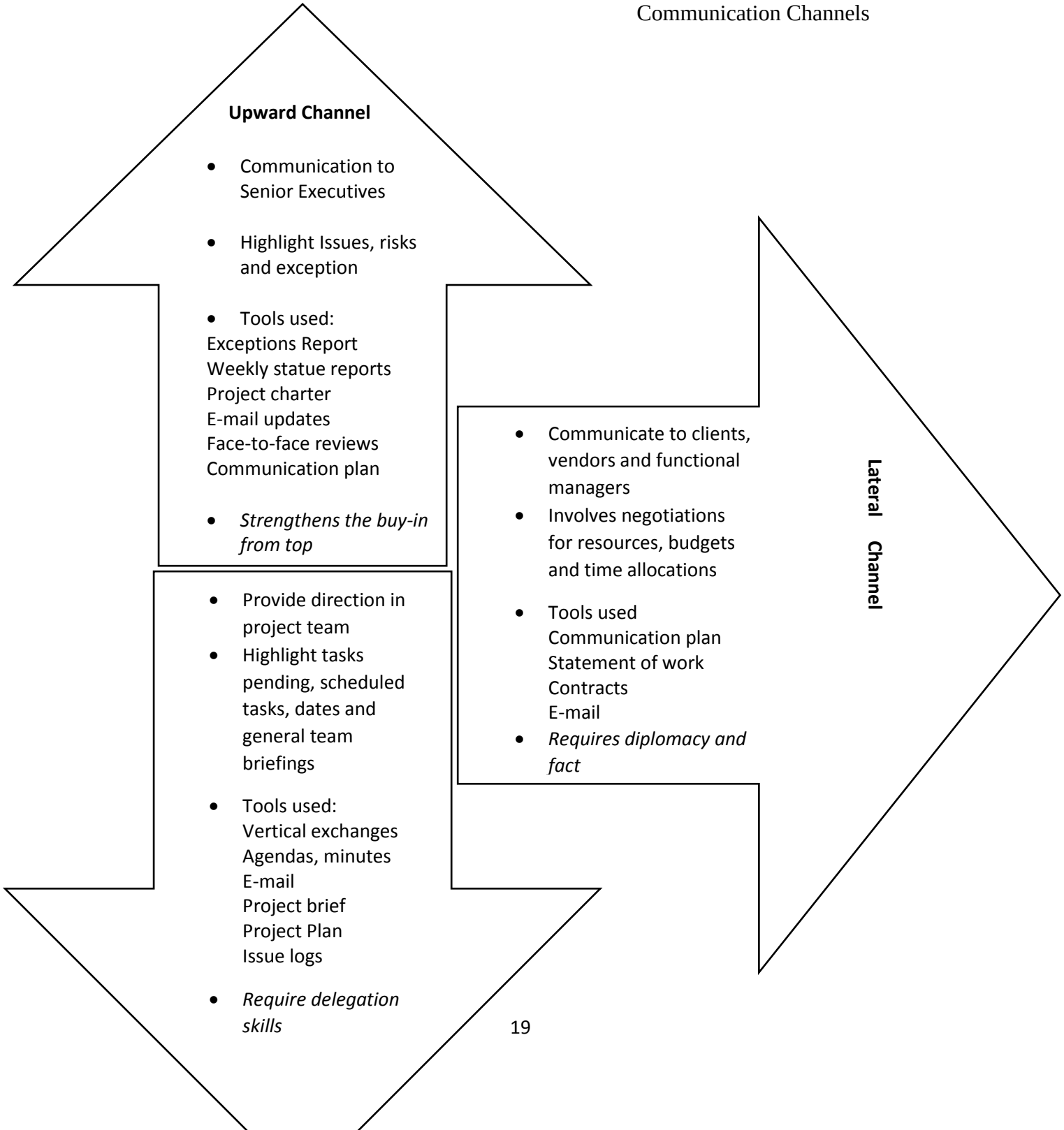


Figure 2.5: Communication channel

Source: Keyton, 2011

2.7.6 Barriers to Communication

Communication barrier is anything that prevents us from receiving and understanding the messages others use to convey their information, ideas and thoughts (Renult,2016). Barriers in communication are usually not something to anticipate but is normally faced during communication. Hence, many a times it affects the relationship among family members or management in any institute. More specifically, communication influences the effectiveness of instruction, performance evaluation, and the handling of discipline problems. Communication should be straightforward. What can make it complex, difficult, and frustrating are the barriers. Some barriers of communication are the following. Different authors have taken different perspectives on defining barriers to effective communication. Together, these present a range of challenges that must be overcome if communication is to be successful. Torrington and Hall (1998) identify several barriers to effective communication including

- *The individual's frame of reference* – People normally act on information based on their understanding on the message received or sometimes they assess the messages based on the kind of cultural traits acquainted to as these attitudes normally result them in problems.

- *Stereotyping* –People normally rush to justify other people's behaviours and this attitude that normally get people to have patience to analyse situations before concluding. And judge others based on what is heard. This normally result to a lot of issues.
- '*Halo or horns' effect* –this is when someone stays with some particular people or with a person for a while. The kind of communications that goes around, is what is intended to stay or shape the life of a person concerning how the person understands people. This is usually related to stereotyping, but is more closely related
- *Power differences* –Employees normally are charged have a way of perceiving the top most management. They normally see them not to understand the subordinators.
- *Gender differences* – men are always the people to talk and make decisions whiles women are made to always listen and reflect.
- *Physical surroundings* – These may include noisy equipment and physical proximity which affects communication effectiveness.
- *Language* – variations in language affect communication.

2.8 COMMUNICATIONS OF PATTERN

Communication is one of the important tool in the construction industry. Hence normally hampered by the following reasons (Shutt, 1992);

a. The overlook of communication in the initiation stages which involves communication concerning planning, designing, and others
b. The use of phones is normally used for directives because of long distance from specialist head office.

c. The increase rate at which subcontractors are selected with the notion of the main contractor.

2.9 THIS IS THE COMMUNICATION UNDERGONE AT THE DESIGN OR CONCEPTION STAGE

Normally, this is the stage where the client and consultant meet at the inception of the project and discuss all information concerning the project which includes funds, design of buildings, time needed and others. As stated earlier by Shutt (1992), it is the lack of early consultation and co-operation that has hampered communication and subsequently timely project delivery.

2.10 THE COMMUNICATION INVOLVED DRUING THE APPROVAL BY THE PLANNING AUTHORITY

This is the process whereby the construction industry makes sure that the project does not harm others and make sure that the project is done appropriately. This is normally done by the Planning Authorities.

2.10.1 Structure Planning

This is the process whereby the surroundings or environment in the context of project is looked at again. These include housing, transport, employment and others.

2.10.2 Local Planning

These is prepared concerning the with issues the local areas to make sure that there are no problems raised in these local vicinities. There government agency which is the local Authority Planning Officers inspect t all these issues before the project is approved. Shutt (1992).

2.11 THE COMMUNICATION PRACTICED BETWEEN THE VARIOUS GROUPS

2.11.1 Communication between design team and building team

Project professionals communicate a lot among themselves during the project process. Example include a design by an architect to the builder, there are a lot of communication the goes on to make the builder understand what next to do. Shutt (1992) stated that builders are not normally communicated early concerning the procedures and detail drawings. This is usually lead to delays on the part of builders.

2.11.2 Communication within contractor's organisation

In organisations the kind of communication system employed determines the rate at which information can travel Shutt (1992). The smaller the organisation the faster communication disseminates. The larger the organisation the more time it takes to disseminate communication. Therefore, communication system employed in these organisations may take a long procedure and steps before an information is being disseminated or a decision is taken.

2.11.3 Communication between parties on site

Site meetings normally include important professionals including the architect, quantity surveyors, project managers and others. This is where the design of the project is being made reality. Hence, there a lot of meetings that goes on, during gathering at the site. This is where discussions including the progress of the project is discussed and all the difficulties is shared for solutions.

2.12 THE ROAD SECTOR (GHANA)

The Ministry of Roads and Highways (MRH) is the ministry accountable for Road Project Management (RPM) and road maintenance in Ghana. Road Infrastructure and Support

Agencies (RISA) under MRH are:

i. Ghana Highways Authority (GHA);
ii. Department of Urban Roads (DUR);
iii. Department of Feeder Roads (DFR);
iv. Koforidua Training Centre (KTC); and
v. Ghana Road Fund Secretariat (GRFS);

The vision of the MRH is to provide and retain a combined, economical, harmless and supportable road transport network receptive to the needs of users, supporting development and poverty alleviation.

The mission of the ministry is to transport the mandatory guidelines, monitor and assess packages and projects to safeguard the delivery of inexpensive, combined, innocuous, receptive and supportable road transport network that will meet the financial, communal and ecological needs as well as national and international principles.

Contractors in the roads subsector are also classified into four categories, based on the financial assets of the firm. These are summarized in Table 2.3

Table 2.3: Classification based on financial capabilities

Classification based on financial capabilities	
Class	**Project value**
Class 1	No limit on tender
Class 2	≤ $2.5m
Class 3	≤ $1.3m
Class 4	≤ $0.5m
Classification based on nature of project	
Class A	Major roads and highways

Class B	Bridges and culverts
Class C	Labour-intensive works and steel bridges
Class D	Rehabilitation and maintenance works

Source: Ministry of Roads and Highways, 2019.

Contractors in the roads subsector are also classified into four categories, based on the financial assets of the firm. These are summarized in Table 2.3.

Class 1 contractors are those that have no limit on their tender—they can implement projects of any value. Class 2 contractors are those with the resources to tender bids up to a maximum of US$2.5m, class 3 contractors can tender bids up to a maximum of $1.3m, while class 4 contractors have a maximum of $500,000. In addition to a classification based on financial capabilities, contractors are also classified according to the nature of project. Category A contractor can execute large projects such as major roads and highways, airports, and related structures; a category B contractor is able to execute projects such as bridges, culverts, and other structures. Contractors in categories C and D are able to implement projects relating to labour-intensive works and steel bridges, and rehabilitation and maintenance works, respectively.

Ghana's Road Fund was established in 1985 by an act of parliament to preserve the country's road network. Funds are obtained from multiple sources, including fuel levies; tolls from roads, bridges, and ferries; fees from vehicle licensing and inspection; and international transit fees collected from foreign vehicles entering the country. The Ghana Road Fund Secretariat is the governmental agency, under the Ministry of Roads and Highways, that is mandated to manage the Road Fund. Unlike the road and highways subsector, the housing subsector currently does not have any fund that allows for the maintenance and management of the country's housing structures.

2.12.1 Road Infrastructure in Ghana

The (MRH) is in charge for the maintenance and development of all roads the in Ghana. There are (3) major agencies and department under the ministry which includes: The Department of Urban Roads, The Department of Feeder Roads and The Ghana Highway Authority.

The Department of Urban Roads

This department is responsible for the "development, administration and maintenance" of all urban roads with in the country. Various responsibilities are as follows:

- Minimizing the travel time on the roads.
- Reducing waste of time for boarding public transport within local communities.
- The capacity of the MMDRUs should be strengthened to be capable to manage the roads and coordinate all operations concerning the transport system.

The Ghana Highway Authority

The various responsibilities and roles undergone by the agency which is backed by law. Act540(December, 1997).

- To ensure improvement in road conditions
- To ensure social mitigation measures
- Ensuring that there is travel time from all part of the country is minimized
- Reduction in accident fatalities
- Improvement in the value of delivery of systems.

(*Ministry of Roads and Highways, 20019*)

The Department of Feeder Roads

This department is in charge to make sure that all feeder roads in the country are built properly for the for the convenience of transport of goods and services. Various responsibilities are as follows.

- To device measures to ease the negative environmental impact of road projects which includes road hazard and others.
- To guide funds about improved roads through adequate maintenance system.
- To address all levels of issues concerning of poverty and gender concerning new road areas and districts

(Department of Feeder Roads,2019)

- Liaising with other Governmental Agencies in the management and planning of feeder roads in general
- To Plan, develop and see to the maintenance of feeder roads and bridges.
- To assisting MRT in policy and design for development

- To assist in the selection and prioritization of roads and bridges for improvement and upgrading in the District Assemblies
- *(Department of Ministry of Roads and Highways, 2019)*

2.12.2 Types of Roads

- *Urban roads*- These are normally to be of noble quality. This is because they are much more expensive, and is usually located in the city, which is normally associated with the provision of, bicycle lanes, drainage, and water supply lines, pavements, bus stops, electricity and others normally delivered in the towns.
- *Feeder roads*-. These are cleared paths that is characterized by gravelled surfaces. Again, the are very the trivial roads in rural areas.

- *Trunk roads*: - these are normally referred to as highways. They are the kind of roads constructed to connect harbours, cities and others.

SUMMARY

This chapter reviews the current knowledge including substantive findings, as well as theoretical and methodological contributions to the topic. This chapter is divided into three sections. The first section gives an overview of the Ghanaian Construction Industry, which comprises of the building project consultants, engineers, architects, quantity surveyors, building contractors, artisans, and some government actors within the construction industry. It also states the two main industry in charge of the industry, which includes the Ministry of Works and Housing supervises all building and civil works within the country and the Ministry of Roads and Highways which oversees the activities of players in the construction and maintenance of roads, highways, railways, airports and other structures.

The two ministry is also responsible for the classification of contractors within the industry which is primarily based on financial resources, human resources capacity and level of methodology. It also defines project stakeholders and also gives the types of stakeholders within the industry, which includes the internal stakeholders thus, team members, facilities managers, designers, subcontractors and others. The external stakeholders include the general public, government and others.

The section also discusses the concept of communication, thus, it defines communication as the process of transmitting information and common understanding from one person to the other, also gives the types of communication we have which is the intrapersonal, interpersonal, group communication and multi-group communication. It also discusses the elements of communication thus the sender, receiver, message, feedback, channel, context.

Then it moves further to review the characteristics of communication which includes communication as a process, it involves a sender and a receiver, as an information carriers and others. This section also involves the communication methods which exist within the constructuction industry thus, oral, written, nonverbal, electronic, and others. It also presents the communication model by McQuail and Windahl. This channel also elaborates on communication channel thus the upward channel, downward channel, and lateral channel. And the to the barriers of communication which includes individuals frame of preference, stereotyping, power differences, gender differences and others.

The third section also gives an overview of the road sector, the Ministry of Roads and Highways is the ministry accountable for the road project management, and road maintenance in Ghana. The vision on the ministry is to provide and retain a supportable road system receptive of the needs of the users, supporting development and poverty alleviation. It also gives a summary of the functions and core aims of the three main agencies and department under the (MRH), which includes The Department of Feeder Roads, Department of Urban Roads and The Ghana Highway authority. The section also reviews the type of roads in Ghana which includes the Urban roads, Feeder roads, Trunk roads.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter identified the procedures of this study. It involves the availability and selection of appropriate research design, strategy and method that helped address the key questions raised.

3.2 RESEARCH APPROACH

Research approach is a plan and procedure that consists of the steps of broad assumptions to detailed method of data collection, analysis and interpretation. Research approach is essentially divided into two categories, approach of data collection and approach of data analysis or reasoning. Consequently, in analysing data, mixed method was adopted for the purpose of this research, which includes the use of quantitative and qualitative methods. Mixed method, focuses on collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies. It central premise is the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone. It Characteristics includes collection and analyses of both quantitative and qualitative data, Mix two forms of data in different ways, give priority to one or both forms of data, and can be utilized in a single study or in multiple phases of a study.

In terms of data analysis this strategy transforms one type of data into other type of data and analyse combined data. And also, during Interpretation it compares or combines results from both methods. And make a better understanding to make the connection between what is known and what can be learned by research or to test hypotheses (Creswell and Plano, 2011). In mixed method research data collected are often hard and reliable and, therefore, it involves analysing and integrating quantitative examples through experiments, surveys and qualitative

through interviews (Creswell and Plano, 2011). The question this research poses is what are the some of the communication channels employed by construction professionals in the road sector and what to what extent does communication within the sector impact on project delivery.

3.3 UNIT OF ANALYSIS / DATA SOURCES

The term 'unit of analysis' can be simply defined as "the entity that is being analysed in scientific research". Determining or being cognizant of the unit of analysis of the research has a pivotal role in any research endeavour. The construction professionals of the department of Feeder, Urban and Highways under the Ministry of Roads and Highways is the unit of analysis for this study. It is expected that the analysis of these units will provide a context for describing and analysing the case studies.

3.4 POPULATION AND SAMPLE FRAME

The target population for this research include the road construction professionals in the Greater Accra Region, thus the various agencies and departments under Ministry of Roads and Highways, while the accessible population are the Project Managers, Quantity Surveyors, Engineers, Architects, and other professionals, since these are the professionals (respondents) within the researcher's reach.

Project professionals in these departments are selected for the study because they are deemed to be appropriate, as stated in chapter two, Ghana Highway Authority, Urban Roads and Feeder Roads.

These departments also stand as the head offices under which all other road department operate. Most times, for a road construction projects to be undertaken in any part of the Country these firms act as the bases of establishment for all documentation and negotiations

to be undertaken. Also, another reason for focusing on these agencies is that, they are in good standing and have well equipped staff. They are also noted for executing projects with huge contract sums with a wide variety of personnel.

3.5 SAMPLE SIZE

Perhaps the most frequently asked question concerning sampling is, "What sample size do I need?" The answer to this question is influenced by a number of factors, including the purpose of the study, population size, the risk of selecting a "bad" sample, and the allowable sampling error (Israel, 1992). There are several criteria for specifying sample size, which includes the level of precision, the level of confidence or risk, and the degree of variability in the attributes being measured (Miaoulis and Michener, 1976).

Also, other approaches for determining the sample size includes using a census for small populations, imitating a sample size of similar studies, using published tables, and applying formulas to calculate a sample size (Isreal, 1992). For the purposes of this research, the population of meeting up with construction professionals working in the Departments of Urban Roads, Department of Feeder Roads and Ghana Highway Authority was challenging. Therefore, due to this difficulty, the use of convenient sampling method was adopted. A total sample size (m) was used for this research was forty-eight (48). Questionnaires was distributed to the three agencies (Department of Urban Roads, Ghana Highways Authority and Department of Feeder Roads) in the ratio of 17:17:14 respectively.

3.6 SAMPLING TECHNIQUE

Sampling involves the selection of a number of study population. Thus, one advantage of sampling helps to reduce the workload, and makes it easier to gain quality information, but this has to be balanced to be able to attain a credible sixe against having a large enough

sample size. The non- probability sampling is often associated with case study design and quantitative research. With regards to the latter, cases studies tend to focus on small samples and are intended to examine a real life phenomenon, not to make statistical inferences in relation to the wider population.

Consequently, Convenience sampling under **Non**-Probability Sampling Methods was employed for this study, Convenience sampling (also known as grab sampling, accidental sampling, or opportunity sampling) is a type of non-probability sampling that involves the sample being drawn from that part of the population that is close to hand. In convenience there are no other criteria to the sampling method except the people to be available and willing to participate. This method is extremely speedy, easy, readily available, and inexpensive, causing it to be an attractive option to most student's researchers (Ackoff, 1953).

3.7 DATA COLLECTION INSTRUMENT

A structured questionnaire was designed as one of the data collection instrument for this study. And it was self-administered to the various project professionals. These questionnaires consisted of both closed ended and open ended questions and were aimed at the various communication channels employed, communication barriers and impact of communication on project delivery. For the purpose of the study, the questionnaire had four sections.

SECTION A: Questions related to respondent's profile. This was intended to find out the background and experience of respondents.

SECTION B: Questions related to the communication channels practiced in the various Agencies. It contained 8 items a space provided for respondents to express their opinions.

SECTION C: Questions on the level of project communication barriers encountered during construction project delivery. It contained 16 items a space provided for respondents to express their opinions.

SECTION D: Questions on the level of impact communication has on project delivery. It contained 33 items and a space provided for respondents to express their views.

The instrument used was structured in the modified Likert scale, on a 5– point scale ranging from "never, rarely, "sometimes" most of the times to "all the time". Subjects were then instructed to respond to their degree of agreement with the statements contained in the instrument or closed questionnaires.

3.8 DATA PROCESSING AND ANALYSIS

Data analysis tool SPSS was used to analyse the data obtained. This was done with the help of the Frequency Index formula used and the use of ranks to order the occurrence of the level of impacts given. In addition to this, google analytics tool was used to help obtain the charts for the various sections of the questionnaire.

SUMMARY

This chapter is dived under the various topics which includes research approach, data sources, population and sample frame, sample size, sampling technique, data collection instrument and data processing analysis.

The research approach: It is a procedure or method to collect data, data analysis, and interpretation. Consequently, mixed method was adopted in analysing data which involves the qualitative method and quantitative method. Both analyses forms of data in different ways, gives priority to all forms of data.

Unit of Analysis: This includes the data sources which includes the constructuction professionals of Department of Feeder, Urban and Highways.

Population and Sample Frame: This involves the target population for this research which includes the project managers, quantity surveyors, engineers, architects and other professionals from the three main agencies.

Sample Size: Sample size was difficult to obtain since professionals from these agencies were many and could hardly stay in the office, most of them were field workers, therefore sample size was denoted be (n) , 17 questionnaires each was distributed to both Highways and Urban and 14 to Feeder Roads, with the use of convenient sampling.

Sampling Technique:

The sampling technique adopted is the convenient sampling which is a non – probability sampling method, also known as the grab sampling or accidental sampling. It makes use of the sample being drawn from that part of the population that is close to hand.

Data Collection Instrument

The structured questionnaire was used to collect data, which included the open and closed questions. The Likert scale on 5-point scale ranging from never, rarely, sometimes, most a times and all the times were used for closed questions. And respondents could share their own opinion when it comes to the open questionnaires.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

The purpose of this study is to find out the linkage between communication and project delivery. In order to achieve the purpose of this study, a methodology consisting of a review of literature and a survey of the main construction practitioners to obtain how project communication is conducted in the proceeding chapters. This chapter therefore presents the survey results, analyses of the results and findings of the study.

4.2 SURVEY RESULTS

48 questionnaires were distributed to the Department of Feeder roads, Urban roads, and Highways. 17 questionnaires were distributed to both Feeder and Highways. And 16 to Feeder Roads questionnaires respectively. Out of which 48 responses were received. Additional analyses were undertaken to determine the profile of respondents, the respondents‟ position; and the number of years they have been working in the road sector.

4.2.1 Demographic variables

According to the demographic variables as shown in the table 4.1 below. Quantity surveyors who filled the questionnaires 39.6%. 33.3% by Engineers, 8.3% by Planners, 6.3% by Architects. 50% of the working staff are between the ages of 26-30 years, 33.3% are between the ages of 31- 40 years and 8.3% are between 41-60 years. 72.9% of the respondents have the maximum level of education at the BSc level, 27.1% have obtained the MSc level. An overwhelming majority of 50% of the respondents had more than 5-years of experience in the road sector industry. To conclude, it was found that majority of project participants recognizes communication to be a part of project delivery.

Table 4.1: Which Road Infrastructure and Support Agency (RISA) under the Ministry of Roads and Highways do you work with?

Which Road Infrastructure and Support Agency (RISA) under the Ministry of Roads and Highways do you work with?				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Department of Feeder Roads	14	29.2	29.2	29.2
Department of Urban Roads	17	35.4	35.4	64.6
Ghana Highway Authority	17	35.4	35.4	100.0
Total	**48**	**100.0**	**100.0**	

Table 4.2: What is your current position?

What is your current position?				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Architect	3	6.3	6.3	6.3
Contractor	1	2.1	2.1	8.3
Engineer	16	33.3	33.3	41.7
Geodetic engineer	1	2.1	2.1	43.8
Managerial Role	2	4.2	4.2	47.9
Planner	4	8.3	8.3	56.3
Project Manager	2	4.2	4.2	60.4
Quantity Surveyor	19	39.6	39.6	100.0
Total	**48**	**100.0**	**100.0**	

Table 4.3: Kindly indicate your age range below

Kindly indicate your age range below				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
25 years and below	2	4.2	4.2	4.2
26-30 years	24	50.0	50.0	54.2
31-40 years	16	33.3	33.3	87.5
41-60 years	4	8.3	8.3	100.0
Total	**48**	**100.0**	**100.0**	

Table 4.4: What is your minimum level of education?

What is your minimum level of education?				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
BSc	35	72.9	72.9	72.9
MSc	13	27.1	27.1	100.0
Total	**48**	**100.0**	**100.0**	

Table 4.5: How many years of experience on road projects do you have?

How many years of experience on road projects do you have?				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
1-5 years	14	29.2	29.2	29.2
11-15 years	9	18.8	18.8	47.9
6-10 years	24	50.0	50.0	97.9
Above 15 years	1	2.1	2.1	100.0
Total	**48**	**100.0**	**100.0**	

It can be deduced from the table that out of the 48 respondents surveyed, 29% have worked in the construction industry for a period ranging between One (1) to Five (5) years. From Table 4.5, majority of the respondents surveyed have worked in the industry for 6-10 years with a percentage of 50%. Another 18% of the respondents have also worked in the industry for 11 to 15 years. Additionally, only 1% have worked in the construction industry for 15 and above. From this discussion, it can be concluded that most of the respondents have adequate experience in construction and as such the information obtained from them can be considered credible and reliable. This gives credence to the findings provided.

4.2.2 Communication channels

Table 4.6: RESPONSES TO THE LEVEL OF FREQUENCY OF COMMUNICATION CHANNELS BEING USED BY PROJECT PROFESSIONALS

RESPONSES TO THE LEVEL OF FREQUENCY OF COMMUNICATION CHANNELS BEING USED BY PROJECT PROFESSIONALS

	E-mails	Face to Face Discussions	By the Use of Local Media	Weekly status reports	Telephones	Through Conference Meetings	Through Conference Calls	Through Live Stream Videos
Never			4					23
Rarely			11	2		3	18	21
Sometimes	1	8	22	16		18	7	3
Most of the time	8	16	9	26	9	7	1	1
All the time	39	24	2	4	39	20	18	
Total	**48**	**48**	**48**	**48**	**48**	**48**	**44**	**48**

There are several communication channels used by project professionals during project delivery. Eight of these several channels were provided for respondents to tick the ones they normally use on their projects. The responses are as follows:

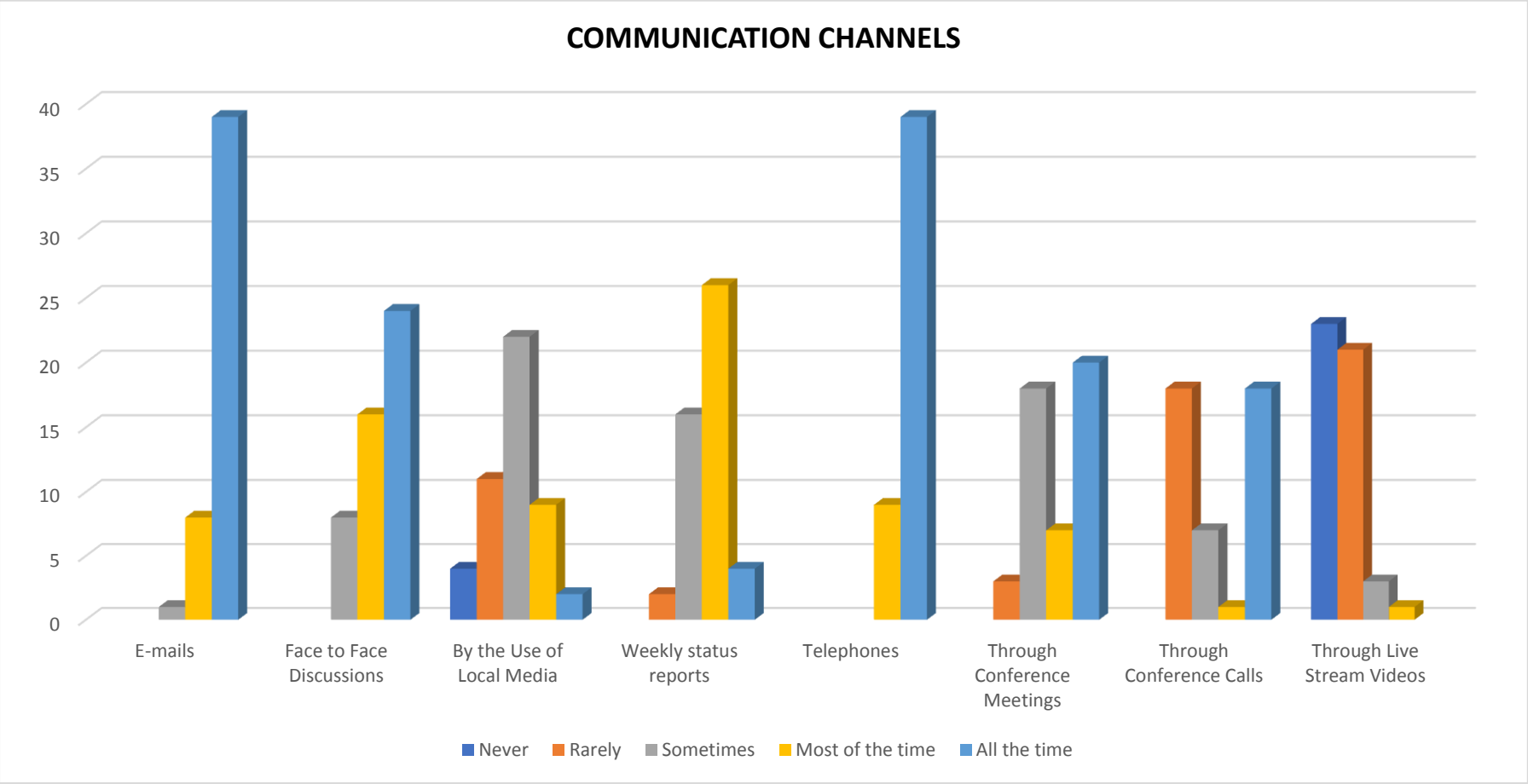


Fig 4.1: COMMUNICATION CHANNELS

Discussions / Comments

E-mails

E-mails are messages distributed by electronic means from one computer user to one or more recipients via a network. This has become a widely used method of communication due to its simplicity and availability in most developed and developing countries.

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (81.3%) respondents ticked (5) all the time. (16.7%) ticked most of the time, (2.1%) ticked sometimes, (0%) ticked Rarely and (0%) ticked never.

Majority of the correspondents (81.3%) attested to the fact that, emails are widely used in the construction industry as a channel of communication.

Face to Face Discussions

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (50%) respondents ticked (5) indicating all the time. (33.3%) respondents ticked (4) indicating most a times, (16.7%) ticked (3) indicating sometimes, (0%) ticked (2) Rarely and (0%) (1) ticked never.

Half of the respondent believed that face to face discussions are used as a channel of communication all the time.

Using local media (radio and TV Stations)

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (4.2%) respondents ticked (5) indicating all the time. (18.8%) respondents ticked (4) indicating most of the time, (45.8%) ticked (3) indicating sometimes, (22.9%) ticked (2) Rarely and (8.3%) ticked (1) indicating never.

This showed that, local media is not a regular channel of communication in the construction industry. This local media in the past decade has turned to somewhat "not too trusted" channel of communicate due to the political propaganda. A complete change of words or just the headline can depict a very different meaning than what it was intended. As such, the construction industry does not often use this medium of communication.

Weekly Status Reports

Weekly Status Reports are internal channels of communication which summarize the work activities for the week to show planned work, work in progress and completed works during the week. The status reports are normally provided by the supervisors of an ongoing project to their managers.

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (8.3%) respondents ticked (5) indicating all the time. (54.2%) respondents ticked (4) indicating most of the time, (33.3%) ticked (3) indicating sometimes, (4.2%) ticked (2) Rarely and (0%) ticked (1) indicating never.

Based on the responses given, the weekly status reports is used most of the time and sometimes. This indicates that work status on construction is not communicated all the time to managers.

Telephones

The easiest form of communication is the use of the telephone. It is widely used in and out of any industry. The telephone is a very quick way to relay information to someone who is out of sight.

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (81.3%) respondents ticked (5) indicating all the time. (18.8%) respondents ticked (4) indicating most

a times, (0%) ticked (3) indicating sometimes, (0%) ticked (2) Rarely and (0%) ticked (1) indicating never. Majority of the respondents agreed to the use of telephone all the time.

Through Conference Meetings

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (41.7%) respondents ticked (5) indicating all the time. (14.6%) respondents ticked (4) indicating most a times, (37.5%) ticked (3) indicating sometimes, (6.3%) ticked (2) Rarely and (0%) ticked (1) indicating never.

Conference meetings requires physical presence in a room and although this is somewhat used all the time, It is rather difficult to gather every member on the project to be holding conferences all the time and so I agree with the respondents on the occurrence of this channel of communication.

Through Conference calls

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (40.9%) respondents ticked (5) indicating all the time. (2.3%) respondents ticked (4) indicating most a times, (15.9%) ticked (3) indicating sometimes, (40.9%) ticked (2) Rarely and (0%) ticked (1) indicating never

Unlike conference meetings, conference calls do not require physical presence. This channel should not be used all the time because construction requires more time on the work with little time for having conferences and meetings. As such, I tend to agree with the respondents.

Through Live Stream Videos

From the above figure communication channels were provided to respondents to choose the appropriate channel in which they frequently use. Out of the 48 responses received (0%) respondents ticked (5) indicating all the time. (2.1%) respondents ticked (4) indicating most a

times, (6.3%) ticked (3) indicating sometimes, (43.8%) ticked (2) Rarely and (47.9%) ticked (1) indicating never

Other Opinions

Again, the questionnaire provided a chance for respondents to share their opinion from their own experience what other communication channel do they practice, Out of 48 responses received, 33 respondents indicated their personal experience on some communication channels they use. These include;

The notice board.

They indicated that these notice boards are normally used to display individual or company certificates and accomplishments, thus helping to boost the morale of employee in the organization. They also use it to display graphs, data, facts and other relevant information on business trends for employees.

Meeting Suppliers

Another way of communicating is to arrange for meetings with suppliers to do financial diligence check, also touring a supplier's facility can give a buyer a sense of how efficient the operations are being managed, and also helps to discuss what is required or expected from each party. And to also have a strategic relationship (Solution Intelligence for Procurement, 2014)

Performance Evaluation Scheme

This is also another way in which project professionals use to communicate. It helps project managers to evaluate how effectively employees are fulfilling their job responsibilities and contributing to the accomplishment of the project to be delivered. In most cases managers

also provide feedback to employees, a process that can produce strong reactions (iEduNote, 2017)

Evaluation Suggestion Scheme

This is also designed to achieve a number of goals for organizations. The organization states it goals for the suggestion scheme and the success of the suggestion scheme is assessed against achievement of the stated goals (Lasrado, Rizvi 2014)

Customer Satisfaction Survey

It is the process of discovering whether or not a company's customers are happy or satisfied with the products or services received from the company. It may be conducted face to face, over the phone or via email or internet or on handwritten forms. Customers answers to questions are then used to analyse whether or not changes need to be made in the project activities to increase overall satisfaction of customers.

Table 4.7: Response to the level of project communication barriers encountered during construction project delivery

RESPONSES TO THE LEVEL OF PROJECT COMMUNICATION BARRIERS ENCOUNTERED DURING CONSTRUCTION PROJECT DELIVERY								
Barrier to communication in construction projects	Frequency of occurrence of each factor quoted by Respondents					Total number of Respondents	Frequency Index (F.I)	Rank
All Respondents	**Never**	**Rarely**	**Sometimes**	**Most of the time**	**All the time**			
Bias towards certain people	1	2	18	19	8	48	0.729	1
Power play		4	18	22	4	48	0.708	2
Lack of feedback	1	5	14	27	1	48	0.692	3
Lack of adequate access to the information databases.	1	3	24	17	3	48	0.675	4
Difficulty in building trust and relationship	2	2	24	16	4	48	0.675	4
Cultural differences	2	5	18	19	4	48	0.675	4
Changes to the project are not communicated on time	1	4	23	18	2	48	0.667	7
Information not readily available when needed	2	8	21	15	2	48	0.629	8
Information sent not delivered to recipient	2	7	24	13	2	48	0.625	9
Change in the meaning of information communicated		11	21	15	1	48	0.625	9
Differing perception		8	29	10	1	48	0.617	11
Directives are not carried out according to the instructions issued	1	7	29	10	1	48	0.613	12
Receiving conflicting information from others		7	32	8	1	48	0.613	12
Poor listening and premature evaluation	1	5	34	8		48	0.604	14
Use of technical languages and jargons	2	8	34	3	1	48	0.571	15
Handling more information than necessary in a particular period o	2	15	24	7		48	0.550	16

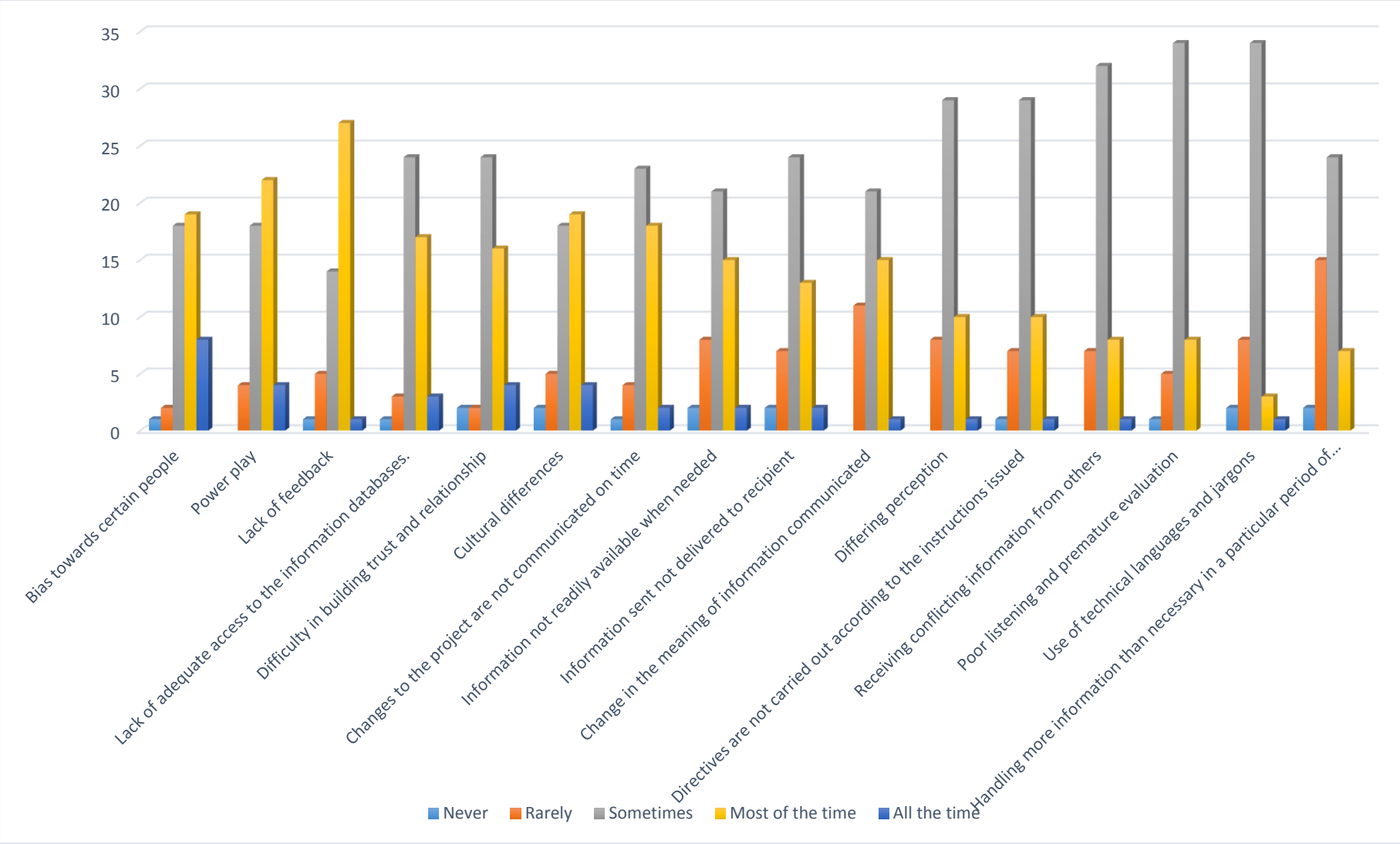


Fig 4.2 Communication channel

4.2.3 The level of communication barriers encountered during project delivery

The respondents were tasked to rate the frequency at which communication barrier is encountered during project delivery. The use of the Likert scales Never (1), Rarely (2), Sometimes (3), Most of the times (4), All the time (5) was used. This method of analyses was used to find out the communication barriers which were commonly occurre on construction projects

Frequency Index (F.I) =where n_1 is the number of respondents who answered "all the time", n_2 the number of respondents who answered "most of the times", n_3 the number of respondents who answered "sometimes", n_4 the number of respondents who answered "rarely" and n_5 the number of respondents who answered "never". The formula used in calculating the Frequency Index is:

$$\frac{\sum 5n_1 + 4n_2 + 3n_3 + 2n_4 + n_5}{5(n_1 + n_2 + n_3 + n_4 + n_5)}$$

Based on the responses given, "Bias towards certain people" is believed to be the most occurring barrier incurred during project communication with a frequency index of (**0.729).** This is followed by Power Play (**0.708)** as ranked in the table above. The table filtered in order of the Frequency Index and the respondents believed that, Handling more information than necessary is the least of barriers that affect the communication.

Responses to the level of impact of communication on construction project delivery

Table 4.8: Level of impact of communication on project delivery

LEVEL OF IMPACT OF COMMUNICATION ON PROJECT DELIVERY					
	No impact	**Low impact**	**Medium impact**	**High impact**	**Very high impact**
Leads to Innovations and better technological solutions			2	13	33
Influences quality of projects			5	26	17
Better decision making			4	22	22
Leads to Quick and Fast Project Delivery			3	14	31
It helps Builds confidence and strengthens teams			7	28	13
It helps Build and maintain relationships on construction projects			9	26	13
Creates feedback loops	1	1	6	32	8
Improves team management			8	28	12
Provides clear and accurate documentation essential to ensure quality delivery				15	33
Proper mitigation of mistakes			3	38	7
Increases productivity	1		1	12	34
Leads to better project collaboration			5	23	20
Leads to Clear and updated reports			5	16	27
Better understanding of decisions and plans		1	9	29	9

Project Failure	28	12	2	5	1
Dispute	17	24	1	5	1
Over Budget	16	22	7	2	1
Time Overrun	14	25	4	2	3
Site Accidents	20	22	1	2	3
Poor Quality	28	14	2	2	2
Reworks	28	11	2	2	1
Poor collaboration	17	24	4	3	
Unmotivated Shareholders	11	30		2	1
Unmotivated Shareholders	12	29	1	2	
Untimely reactions	15	26	1	1	1
Low productivity rate	27	13	4		
Poor understanding	14	22	8	3	1
Unsatisfied client	9	31	6	2	
Constant Schedule changes	31	10	2	3	2
Poor output quality	28	13	5	2	
Vulnerability to risks increase	16	24	1		3
Unsatisfactory documentation	20	21	1	1	1

Leads to Innovations and better technological solutions

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 46 of them agreed that communication leads to innovations and better technological solutions and has a Very high impact or high impact in project delivery. An insignificant number of 2 respondents agreed that communication leads innovations and better technological solutions and has medium

impact on quality of projects. And none of respondents agreed that communication does not lead to innovations and better technological solutions and has no impact or low impact influence in quality of projects.

Influences quality of projects

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 43 of them agreed that communication influences quality of projects and has a Very high impact or high impact in project delivery. A significant number of 5 respondents agreed that communication influences quality of projects has medium impact influence on quality of projects. And 0 of respondents agreed that communication does not influence quality of project and has no impact or low impact influence in quality of projects.

Better decision making

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 44 of the respondents agreed that communication leads to better decision making and has a Very high impact or high impact in project delivery. A significant number of 4 respondents agreed that communication Leads to better decision making and has a medium impact projects on project delivery. And 0 of respondents agreed that communication does not lead to better decision making and has no impact or low impact on of projects delivery.

Leads to Quick and Fast Project Delivery

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 45 of the respondents agreed that communication leads to quick and fast Project delivery and has a Very high impact or high impact in project delivery. A significant number of 3 respondents agreed that communication leads to quick and fast project delivery and has medium impact on projects. And 0 of

respondents agreed that communication does not lead to quick and fast Project and has no impact or low impact on projects delivery.

It helps builds confidence and strengthens teams

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 41 of the respondents agreed that communication helps build confidence and strengthens teams and has a Very high impact or high impact in project delivery. A significant number of 7 respondents agreed that communication helps builds confidence and strengthens teams and has medium impact on projects. And 0 of the respondents agreed that communication does not help build confidence and strengthens teams and has no impact or low impact on project delivery.

It helps build and maintain relationships on construction projects

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 39 of the respondents agreed that communication helps build and maintain relationships on construction projects and has a Very high impact or high impact in project delivery. A significant number of 9 respondents agreed that communication helps builds and maintain relationships on construction projects and has medium impact on projects. And 0 of the respondents agreed that communication does not help build and maintain relationships on construction projects and has no impact or low impact on quality project delivery.

Creates feedback loops

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 46 of the respondents agreed that communication creates feedback loops and has a Very high impact or high impact in project delivery. A significant number of 6 respondents agreed that communication creates feedback loops on construction projects and has medium impact on projects. And 1 of the respondents

agreed that communication creates feedback loops and has low impact on project delivery. Also 1 respondent agreed that communication does not creates feedback loops and has no impact or low impact on quality project delivery.

Improves team management

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 40 of the respondents agreed that communication Improves team management and has a Very high impact or high impact in project delivery. A significant number of 8 respondents agreed that communication Improves team management and has medium impact on projects. And 0 of the respondents agreed that communication does not improve team management and has low impact and no impact on project delivery.

Provides clear and accurate documentation essential to ensure quality delivery

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 47 of the respondents agreed that communication Provides clear and accurate documentation essential to ensure quality delivery and has a Very high impact or high impact in project delivery. There was 0 number of respondent in agreement with medium impact, low impact and no impact.

Proper mitigation of mistakes

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 45 of the respondents agreed that communication leads to Proper mitigation of mistakes and has a Very high impact or high impact in project delivery. A significant number of 3 respondents agreed that communication leads to Proper mitigation of mistakes and has medium impact on projects. And 0 of the respondents agreed that communication does not leads to Proper mitigation of mistakes and has low impact and no impact on project delivery.

Increases productivity

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 46 of the respondents agreed that communication leads to Proper mitigation of mistakes and has a Very high impact or high impact in project delivery. None of the respondent agreed to having medium impact on productivity. And 1 of the respondents agreed that communication does not increase productivity and has low impact and no impact on project delivery.

Leads to better project collaboration

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 43 of the respondents agreed that communication leads to better project collaboration and has a Very high impact or high impact in project delivery. A significant number of 5 respondents agreed that communication leads to better project collaboration and has medium impact on projects. And 0 of the respondents agreed that communication does not leads to project collaboration and has low impact and no impact on project delivery.

Leads to Clear and updated reports

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 43 of the respondents agreed that communication leads to Clear and updated reports and has a Very high impact or high impact in project delivery. A significant number of 5 respondents agreed that communication leads to Clear and updated reports and has medium impact on projects. And 0 of the respondents agreed that communication does not leads to Clear and updated reports and has low impact and no impact on project delivery.

Better understanding of decisions and plans

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 38 of the respondents agreed that communication leads to Better understanding of decisions and plans and has a Very high impact or high impact in project delivery. A significant number of 9 respondents agreed that communication leads to Better understanding of decisions and plans and has medium impact on projects. And 0 of the respondents agreed that communication does not lead to Clear and updated reports and has low impact and no impact on project delivery.

Dispute

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 41 of the respondents agreed that communication does not lead to dispute and therefore has no impact and low impact project delivery. One of the respondent agreed that communication leads to dispute and has medium impact on projects. 5 of the respondents agreed that communication leads to dispute and therefore has high impact on project delivery. Whiles one of the respondent also agrees that communication leads to dispute and has a very high impact on project delivery.

Poor Quality

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 42 of the respondents agreed that communication does not lead to poor quality and therefore has no impact and low impact project delivery. Two of the respondent agreed that communication leads to dispute and has medium impact on projects. Another 2 of the respondents agreed that communication leads to dispute and therefore has high impact on project delivery. Whiles extra 2 of the respondent also agrees that communication leads to dispute and has a very high impact on project delivery.

Low Productivity

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 40 of the respondents agreed that communication does not lead to low productivity rate and therefore has no impact and low impact project delivery. Four of the respondent agreed that communication leads to dispute and has medium impact on projects. Also none of the respondents agreed that communication leads to dispute and therefore does not have high impact or very high impact on project delivery.

Poor Understanding

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 36 of the respondents agreed that communication does not lead to poor understanding and therefore has no impact and low impact project delivery. 8 of the respondent agreed that communication leads to dispute and has medium impact on projects. Another 3of the respondents agreed that communication leads to dispute and therefore has high impact on project delivery. Whiles one of the respondent also agrees that communication leads to dispute and has a very high impact on project delivery.

Constant Schedule changes

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 41 of the respondents agreed that communication does not lead to constant schedule changes and therefore has no impact and low impact project delivery. 2 of the respondent agreed that communication leads to dispute and has medium impact on projects. 3 of the respondents agreed that communication leads to dispute and therefore has high impact on project delivery. Whiles two of the respondent also agrees that communication leads to dispute and has a very high impact on project delivery.

Vulnerability risk increase

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 40 of the respondents agreed that communication does not lead to vulnerability risk increase and therefore has no impact and low impact project delivery. One of the respondent agreed that communication leads vulnerability risk increase and has medium impact on projects. None of the respondents agreed that communication leads vulnerability risk increase and therefore has high impact on project delivery. Whiles two of the respondent also agrees that communication leads to vulnerability risk increase and has a very high impact on project delivery.

Unsatisfactory Documentation

With a total of 48 responses received from the Department of Feeder Roads, Department of Urban Roads, and Highways under the road sector in Accra, 41 of the respondents agreed that communication does not lead to Unsatisfactory Documentation and therefore has no impact and low impact project delivery. One of the respondent agreed that communication leads to Unsatisfactory Documentation dispute and has medium impact on projects. One of the respondents agreed that communication leads to Unsatisfactory Documentation and therefore has high impact on project delivery. Also another one of the respondent also agrees that communication leads to Unsatisfactory Documentation and has a very high impact on project delivery.

Based on the Frequency Index, respondents believe that bias towards certain people has become a major threat to effective communication in the construction industry. This tends to confirm the bias in our system which tends to favour most people than others who truly deserve it based on merits. The bias could be political, tribal or any other form which results in underachieving of project targets.

SUMMARY

This chapter entails the analysis of data and discussion of results. It gives the result of the survey which is 48 questionnaires which was distributed among agencies 48 results was obtained, and additional analysis was undertaken to determine the profile of the respondents, their positions and the years of work experience in the road sector. Quantity surveyors who filled the questionnaires 39.6%. 33.3% by Engineers, 8.3% by Planners, 6.3% by Architects. 50% of the working staff are between the ages of 26-30 years, 33.3% are between the ages of 31- 40 years and 8.3% are between 41-60 years. 72.9% of the respondents have the maximum level of education at the BSc level, 27.1% have obtained the MSc level. Majority of 50% of the respondents had more than 5-years of experience in the road sector industry. To conclude, it was found that majority of project participants recognizes the fact that there is a relationship between communication and project delivery. And that they both work hand in hand.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter gives a detailed summary of the findings, conclusions and also gives a brief suggestions and recommendations which could be considered in future research. The objectives of this research identifies the various communication channels employed in the road sector and to identify the various communication barriers affecting project delivery, and to assess the perceived impact of communication on project delivery.

5.2 SUMMARY OF FINDINGS

The conclusion of the study is presented below according to the objectives of the study.

5.2.1 Communication Channels On Project

In accordance to the responses received from project participants within the road sector in Accra, there is the usage of different kinds of communication channels employed during project construction. Every project professional could indicate the channel employed the most during project initiation. With regards to the data collected one could realize the frequency at which a communication channel is being used. For instance, it was agreed by majority of the construction project professionals that the maximum communication channel employed is the use of e-mails and telephones, followed by face to face discussions and weekly reports, then to the use of local media which is tv and radio, followed by conference calls and live stream videos.

Again, most of the respondents could also share their opinions on communication channel employed in the road sector based their work experience which includes:

- The use of notice boards
- The use of social media platforms example what sap

- Correspondence letter writing to all regional offices
- Meeting with suppliers
- Evaluation Suggestion Scheme
- Customer Satisfaction Survey
- Site Meetings
- Performance Evaluation Scheme

5.2.2 Communication barriers encountered during project delivery.

Amongst the questionnaire were a number of communication barriers likely to be encountered during project delivery. Respondents were made to identify the level of project communication barriers to be encountered during construction project delivery. Communication barriers that normally has a high rate of occurring are stated below.

- Bias towards certain people
- Lack of feedback
- Difficulty in building trust
- Cultural differences
- Power play
- Differing perceptions
- Changes to the project are not communicated on time
- Information sent not delivered
- Information not readily available when needed
- Lack of adequate access to the information databases.

Also, respondents were able to give their own opinions on other pressing barriers they encounter when undertaken their activities. And this was some of their response

- Long chain of command
- Unclear channels of communication resulting in delays
- Inadequate experience in current communication systems

5.2.3 The level of impact of communication on project delivery

With regards to the data collected from the use of communication channels in Table 4.6 and figure 4.1, to the communication barriers encountered illustrated in Table 4.7 and Figure 4.2 through to the level of impact of communication on project delivery, it can be noticed that communication involved in project delivery one way or the other.

A clear evidence is when respondents were asked to rate the level of communication impact on project delivery as shown in Table 4.8. We could realise that, from the above table and interpretation that the positives characteristics of communication outstand the negative impact of communication on project delivery.

And also anytime there is a negative impact project delivery is low, but when there is a positive impact project delivery is high. With regards to this, we can say that there is a strong relation between communication and project delivery. The responses were directly received from project professionals and they attest to the fact that there is a link between communication and project delivery.

5.3 CONCLUSION

From the responses gathered from project professionals within the road sector in Accra, there was a strong communication practice established and the use of most communication channels was use to achieve communication on project activities. With regards to the use of communication channels, there were undisputed agreements of the use of variety of communication channel on project delivery.

For instance, most respondents agreed they made use of e-mails and telephones, site meetings and weekly reports to communicate among themselves and also it was agreed that negative communication practices result in low project delivery leading to low productivity, delays and unsatisfied stakeholders.

Furthermore, all the players within the industry agreed that effective communication is a part of project delivery process and has a great positive effect on it without it there will be unreliable project delivery. “There is no communication without project delivery” and vice versa. For instance, communication plan reviewed regularly and adjusted becomes necessary for project successes.

5.4 RECOMMENDATION

In reference to the above study, the following recommendation is being suggested:

The world has now become a global village and every activity is being undertaken at a high speed. The use of the internet to communicate is being used at a high phase, therefore I would like to suggest that moving forward with project works in our road sector as a country, the use of the internet should be much use to communicate to stakeholders within the industry ease high rate of late delivery of information and to speed up the project delivery process.

Also, long chain of command within the government agencies especially the road sector was a a point the respondents could not left out just because it is really a big problem they face. So moving forward I will like to plead that the Government of Ghana should have another look at the bureaucracy level been practiced in the ministries before one letter is being signed and accepted. This is because the number of days and hours, and heads of department a letter is supposed to undergo before a suggestion is been approved is causing more damage than good to the sector.

Again, there is was a high rate of power play, trust issues, bias to people and cultural differences when it comes to the barriers which occurs the most. The result a test to the fact that with in the road sector participants exhibit their roles based on subjective ways and not being objective to achieve a desirable decision for all. Hence, industry players should be mindful and try to treat each and every person within the industry fairly and equally.

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APPENDIX

SURVEY QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ART AND BUILT ENVIRONMENT

DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND MANAGEMENT

SURVEY QUESTIONAIRE: ASSESSING THE NEXUS BETWEEN COMMUNICATON AND PROJECT DELIVERY. A CASE STUDY ON THE ROAD SECTOR (ACCRA, GHANA)

INTRODUCTION

The Researcher is a Master of Project Management Student at the Kwame Nkrumah University of Science and Technology, Kumasi and is undertaking a research into **"Assessing The Linkage Between Communication and Project Delivery: A CASE STUDY IN THE ROAD SECTOR (ACCRA)"** for purely academic purposes. All information furnished will therefore be treated with strict confidentiality.

The study seeks to identify the current communication practices employed in the road sector, to determine the perception of the current state of project delivery in the road sector, to assess the perceived impact of project communication on project delivery and the various communication barriers affecting project delivery. The identification of these communication practices and their impact will enable to further understand if there is really a linkage between communication and project delivery.' The expected outcome of the research is to help provide comprehensive framework and guidelines of the communication been practiced within the construction **professionals** during project delivery which would enhance the planning, design, construction and administration of road infrastructure projects

It is my belief that you will provide answers to the questions below to enable me present a good report. Your responses will be an immense contribution to the success of this research.

Thank you.

Yours faithfully,

Masters Student

Amanda Koranteng

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Project Supervisor

Professor Dickson Osei-Assibey

Department of Construction, Technology and Management

KNUST- Kumasi

SECTION A: BACKGROUND INFORMATION OF RESPONDENTS

(Please respond to the following questions by either ticking (√), writing or highlighting your responses as appropriately as possible)

1.1 Which Road Infrastructure and Support Agency (RISA) under the Ministry of Roads and Highways (MRH) do you work with?

a) Department of Feeder Roads b) Department of Urban Roads

c) Ghana Highway Authority d) Ghana Road Fund Secretariat

e) Others (please specify) ……

1.2 What is your current position?

a) Project Manager b) Quantity Surveyor

c) Operations Manager d) Civil Engineer

e) Architects f) Land Surveyor

g) Engineers h) Contractor

i) Others (please specify) ……

1.3 Kindly indicate your age range below

a) 25 years and below b) 26 -30 years

c) 31 - 40 years d) 40 -60 years

e) 41 – 60 years f) 51 – 60 years

g) 60 and above

1.4 What is your maximum level of education?

a) HND b) BSc c) MSc d) PhD

e) Others (please specify) ……

1.4 How many years of experience on road projects do you have?

a) 1-5 years b) 6-10 years c) 11-15 years

d) Above 15 years

SECTION B: Below are some communication channels. From your experience please tick (√) the appropriate cell by indicating how frequently do you use this channel using the frequency key: **1=Never; 2= Rarely; 3= Sometimes; 4= Most of the times; 5= All the time**

Communication Channels	**1**	**2**	**3**	**4**	5
E-mails					
Face to face discussions					
By the use of radio and TV stations					
Weekly status reports					
Telephones					
Through conference Meetings					
Through conference calls					
Through Live stream videos					
In your professional practice, what other communication channel do you practice					

SECTION C: THE LEVEL OF PROJECT COMMUNICATION BARRIERS ENCOUNTERED DURING CONSTRUCTION PROJECT DELIVERY

Below are a number of communication barriers encountered during construction projects delivery. From your experience please tick (√) the appropriate cell to indicate your level of agreement of these barriers. key: **1=Never; 2= Rarely; 3= Sometimes; 4= Most of the times; 5= All the time**

Communication Barriers	**1**	**2**	**3**	**4**	**5**
Lack of adequate access to information database					
Information not available when needed					
Information sent not delivered to the recipient					
Handling more information than necessary in a particular period of time					
Change in meaning of information communicated					
Changes in the project delivery are not communicated on time					
Poor listening and premature evaluation					
Directives not carried out according to the instructions issued					
Lack of feedback					
Differing perception					
Power play					
Bias towards certain people					

Difficulty in building trust and relationship					
Cultural differences					
Use of technical language and jargons					
Receiving conflicting information from others					
In your professional practice, what other communication barriers have you experienced?					

SECTION D: **LEVEL OF IMPACT OF COMMUNICATION ON PROJECT DELIVERY**

Below are a number of impact of communication on projects delivery. From your experience please tick (√) the appropriate cell to indicate the rate of impact of communication on project delivery to you. key: **1=No Impact; 2= Low Impact; 3= Medium Impact; 4= High Impact; 5= Very High Impact**

No	**Impact of Effective Project Communication**	**1**	**2**	**3**	**4**	**5**
1	Leads to more innovations and better technological solutions					
2	Influences quality of projects					
3	Better decision making					
4	Leads to quick and fast project delivery					
5	Builds confidence and strengthens team					
6	It helps builds and maintain relationships on construction projects					
7	Creates feedback loops					
8	Improves management of teams					
9	It provides clear and accurate documentation essential to ensure quality delivery					
10	Mistakes can be mitigated with proper communication					
11	Increase productivity					
12	Leads to better project collaboration					
13	Leads to clear, and updated reports					
14	It enables decisions and plans to be well understood by the whole team and stakeholders throughout the project					

15	Project Failure					
16	Dispute					
17	Over Budget					
18	Time Overrun					
19	Accidents					
20	Poor Quality					
21	Reworks					
22	Poor collaboration					
23	Unmotivated Shareholders					
24	Untimely reactions					
25	Mistakes					
26	Low productivity rate					
27	Poor understanding					
28	Poor interpretation					
29	Unsatisfied Client					
30	Constant schedule changes					
31	Poor output quality					
32	Vulnerability to risks increase					
33	Unsatisfactory documentation					
In your professional practice, what other impacts do communication have on project delivery?						
