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EFFECTS OF CONSTRUCTION COMMUNICATION BARRIERS ON PROJECT OBJECTIVES IN ABUJA-NIGERIA

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The construction industry is wholly reliant upon effective communication between individuals, teams and organizations. However, in a project-based industry, interaction tends to be characterized by unfamiliar groups of people coming together for short periods before disbanding to work on other endeavours. Communication within project-based environments presents special challenges. Hence, this study assessed the effects of construction communication barriers on project objectives in Abuja-Nigeria through the self-administration of 155 questionnaires to construction firms identified. In addition to this, 15 active sites were un-obstructively observed. Results showed that out of 10 variables measured, 5 had high effect on time, while for cost and safety, 1 variable each had high effect on them. Drawings (architectural, services and structural) were the most effective and most often used on the sites observed. Accuracy had very high effect on project objectives in the sense that if inaccurate information was given, it caused project delay (time), caused rework (cost) and also had effect on safety. Information accuracy should always be emphasised on since it has high effect on the project objectives.

Keywords: Channel; Communication; Information; Mode; Nigeria; Project objectives

1 INTRODUCTION

Good communications are one of the main prerequisites for the smooth and profitable running of any organisation. This is particularly so in the construction industry (Shutt, 1992).The construction industry is an information intensive environment from design offices to project construction sites. Because of the intensity and diversity of construction information, the efficiency of information management is crucial to the construction industry and has been recognized as an important competitive advantage to construction companies (Chen and Kamara, 2008). Construction does, however, present a particularly complex (and, for that matter, interesting) environment within which to explore communications phenomena. Because it is project-based, its groups and networks are temporary in nature and relationships and interactions continually change to reflect the dynamic nature of the workplace (Dainty, Moore and Murray 2006).
Construction projects are assembled by gathering different professions and areas of expertise under one “flag” (Wikforss cited in Wikforss and Löfgren, 2007). It was further stated that typical of such assemblies is that each professional group also bears with it a set of principles, rules, knowledge domains and professional skills formulated

in a certain manner. Design and production of construction projects share a need for rapid access to information and communication in real time. Communication solutions aim at breaking down barriers that professional groups carefully and successfully have built up over a long period of time (Wikforss and Löfgren, 2007).The construction industry is wholly reliant upon effective communication between individuals, teams and organizations. However, in a project-based industry, interaction tends to be characterized by unfamiliar groups of people coming together for short periods before disbanding to work on other endeavours. This temporal dimension complicates an already problematic communication environment in which technical language, an adversarial culture and noise/distraction all combine to prevent straightforward information flow from one party to the other. Indeed, the sheer number of stakeholders involved in the processes undertaken during a construction project renders communication networks exceptionally complex and subject to change (Dainty *et al.*, 2006). According to Wikforss and Löfgren (2007), construction projects of today are dependent on reliable and updated information through a number of Information Communication Technology (ICT) based business systems, communication tools and shared storage servers. To solve problems that have arisen on- site and handle critical construction issues there is a need for quick access to necessary information.

1.1 Communication in Construction

Thompson (2002) stated that communication is the process in which information is encoded and imparted by a sender to a receiver via a channel/medium. The receiver then decodes the message and gives the sender feedback. Communication requires all parties to have an area of communication commonality. These commonalities include auditory means such as speaking, singing and sometimes tone voice, as well as non-verbal and physical means such as body language, sign language, paralanguage, touch, eye contact and even written communication. It was further added that communication is a process by which we assign and convey meaning in an attempt to create shared understanding.

Construction communication, within an organizational context, is to convey an instruction to influence the actions/behaviours of others, or may involve an exchange of, or request for information during a construction project. Communication within project-based environments presents special challenges. This is especially true within the construction industry, where interaction tends to be characterized by unfamiliar groups of people coming together for short periods before disbanding to work on other endeavours (Dainty *et al.*, 2006).

According to Emmitt and Gorse (2003), communication is essential to all business activities; it enables an organization, and is an integral part of the construction process. Beyond the argument, any improvement in communication can improve an organization's operating effectiveness. Construction projects are complex and risky, requiring the active participation of all contributors. Co-operation and co-ordination of activities through interpersonal and group communication are essential in ensuring the project is completed successfully. Poor communication, lack of consultation and inadequate feedback are to be found as the root cause of defects in many constructed works. Poor co-ordination and communication of design information lead to design

problems that cause design errors. Communication is the one aspect of the management of projects that pervades all others.

Dainty *et al*. (2006) have recognized that the term communication is in itself a multifarious and complex term, which can mean different things in different context and situations. This is certainly the case within the construction industry, where each project demands communication between wide varieties of participants. There seems little doubt that communication plays a vital role in the effectiveness of organizations. Although managers in different industries undertake diverse tasks and activities, it has been recognized that they spend most of their time involved in communication. Pietroforte (1997) viewed communication as a mechanism through which different ideas, perceptions and business goals are conciliated in order to achieve a common understanding of the meaning and an agreement on the purpose of information.

1.2 Barriers to Effective Communication

Flippo and Munsinger (cited in Liu, 2009) had it that barriers are aspects of communication systems that limit information flow or "colour" information as it is transmitted. There are many factors that can become barriers and filters in the communication process of organizations. The larger and more complicated the organization is, the more levels, barriers and filters the information needs to pass. Excessively long channels further inhibit communications flow (Thomas, Tucker and Kelly, 1998).

In Affare (2012), it was pointed out that that the most frequent barriers to communication on construction projects from the combined perspective of all the three contact groups (namely Clients, contractors and consultants) are in descending order:

Poor listeners; Poor leadership; Unclear communication objectives; Unclear channels of communication; Ineffective reporting system; Ineffective communication between the parties on the project; Limited resources; Information filtering; Lack necessary skills; Lack of trust; Stereotyping; Language difficulties

2 RESEARCH METHODOLOGY

The study adopted a combination of observation and questionnaire survey methods in eliciting information. Observation technique involves the researcher in watching, recording and analysing events of interest (Blaxter, Hughes and Tight, 2006). The observation method which was used was the direct observation. Where the researcher was a neutral and passive external observer and was not involved in the phenomenon of interest (Bhattacherjee, 2012). A total number of fifteen sites were observed in Abuja for about forty minutes each. The following areas were observed

1. Modes of communication on site generally i. e. among all parties on site during the construction stage.
2. To observe and score the effectiveness of some communication variables; accuracy, timeliness, distortions, barriers in accessibility, under loading, overloading, procedural challenges, understanding and gatekeeping.

A questionnaire is a research instrument consisting of a set of questions (items) intended to capture responses from respondents in a standardized manner. Questions may be unstructured or structured. Unstructured questions ask respondents to provide a response in their own words, while structured questions ask respondents to select an answer from a given set of choices. Subjects' responses to individual questions (items) on a structured questionnaire may be aggregated into a composite scale or index for statistical analysis (Bhattacherjee, 2012). According to Oppenheim (1992), a picture of current status can be drawn from a questionnaire survey to confirm the findings from the literature review, either in terms of frequency or prevalence of particular attributes and variables, or the relationship between them. For the purpose of this research, the unit of analysis was the construction firms in Abuja. The total population of registered firms in Abuja identified were 260. The sample size for this study was calculated using a simplified formula proportion in a Table by Krejcie and Morgan (cited in Crafford, 2007), if N=260, then n =155 (where N= total population and n= sample size). One hundred and fifty-five (155) structured questionnaires were administered to these professionals (Architects, Quantity Surveyors, Builders, civil engineers, mechanical engineers and Electrical engineers) within the selected construction companies a total of 132 was returned indicating 85% response rate. In determining the effects of communication on project objectives, Morenikeji (2006) cut-off point was adopted.

1.0 – 1.49=No effect; 1.50 – 2.49=Low effect; 2.50 – 3.49=Unsure; 3.50 – 4.49=High effect; and ≥ 4.50=Very high effect

3 RESULTS AND DISCUSSION

The results of the study are presented in the following section

3.1 Survey Analysis

The results of the 15 construction sites is as presented below

Table 1: Category of Respondents

Profession	Number	Percentage%
Architecture	28	21.2
Builder	23	17.4
Quantity surveying	20	15.2
Civil Engineering	20	15.2
Mechanical Engineering	16	12
Electrical Engineering	15	11.4
Others	10	7.6
Total	132	100

From Table 1, a total of 132 questionnaires were returned; the respondents consisted of 28 Architects which stood at 21.2%, 23 builders which stood at 17.4%, 20 Quantity Surveyors 15.2%, 20 civil engineers 15.2%, 16 mechanical Engineers which is 12%, 15 Electrical Engineers 11.4% and 10 other professionals which stood at 7.6%.

Table 2: Turnover of Companies

Turnover	Number	Percentage%
5-20million	-	
20-50million	-	
50-100million	09	6.8
100million above	123	93.2
Total	132	100

From Table 2, 93.2% of the respondents (123 number) responded that their companies had an annual turnover of N100 million and above while the remaining 6.8 had turnover of N50-100 million.

Table 3: Business Scope of Companies

Company	Number	Percentage%
Building	43	32.6
Civil engineering	17	12.9
Building and civil Engineering	72	54.5
Total	132	100

From Table 3, 32.6% of the response obtained was from Building companies, 12.9% from Civil Engineering companies while 72% was from Building and Civil Engineering companies.

Table 4: Effect of communication Variables on Project Objectives

	TIME		COST		SAFETY	
VARIABLES	MEAN	Decision	MEAN	Decision	MEAN	Decision
Accuracy	**3.62(3rd)**		**3.48(3rd)**		**3.48(2nd)**	
Good quality information free from errors	3.69	High effect	3.57	High effect	3.6	High effect
Being able to understand the spoken and written words, quickly discern the message and formulate a response	3.66	High effect	3.54	High effect	3.53	High effect
Poor coordination	3.51	High effect	3.34	Neutral	3.31	Neutral
Inaccuracy	**3.69(1st)**		**3.50(1st)**		**3.39(3rd)**	
Queries arising regarding deign and not being easily and accurately answered	3.71	High effect	3.54	High effect	3.46	High effect

Conflicting and inconsistent information and instruction	3.66	High effect	3.46	Neutral	3.31	Neutral
Understanding	**3.47(7th)**		**3.36(5th)**		**3.3(4th)**	
Not understanding information expectations and requirements between each other	3.6	High effect	3.4	Neutral	3.4	Neutral
Availability, reliability and ease of assimilation of project information	3.34	Neutral	3.31	Neutral	3.2	Neutral
Timeliness	**3.54(5th)**		**3.49(2nd)**		**3.5(1st)**	
Getting the needful information at the right time	3.54	High effect	3.49	Neutral	3.5	Neutral
Barrier in accessibility	**3.49(6th)**		**3.36(5th)**		**3.25(6th)**	
Contacting the right person and being able to provide the needed information and support	3.46	Neutral	3.31	Neutral	3.31	Neutral
Conflict arising between members	3.54	High effect	3.34	Neutral	3.09	Neutral
Being able to get access to relevant document when needed	3.46	Neutral	3.4	Neutral	3.34	Neutral
Having an understanding of the technology, terminology and philosophy of another discipline's work	3.49	Neutral	3.37	Neutral	3.26	Neutral
Under-loading	**3.49(6th)**		**3.34(6th)**		**3.30(4th)**	
Not having enough information to make decisions and implement work	3.37	Neutral	3.37	Neutral	3.34	Neutral
Overload	**3.60(4th)**		**3.31(7th)**		**3.26(5th)**	
Having more than required information at a particular time than can be utilized	3.6	High effect	3.31	Neutral	3.26	Neutral
Distortion	**3.66(2nd)**		**3.31(7th)**		**3.14(7th)**	

Message changes meaning during diffusion by adding or deleting bits of information	3.66	High effect	3.31	Neutral	3.14	Neutral
Gatekeeping	**3.23(9th)**		**3.09(8th)**		**3.03(9th)**	
Certain message being withheld at a particular time	3.23	Neutral	3.09	Neutral	3.03	Neutral
Procedural challenges	**3.43(8th)**		**3.37(4th)**		**3.09(8th)**	
Communication occurring and not being followed up with written documents to confirm the trivia that has passed between	3.43	Neutral	3.37	Neutral	3.09	Neutral

Time

Out of the 10 major variables measured based on Morenikeji (2006) cut-off points, accuracy, inaccuracy, timeliness, overload and distortion could be deemed to be high effect to time based on the value of their mean scores of 3.62, 3.69, 3.54, 3.60 and 3.66 respectively. On the other hand, variables such as understanding, barrier in accessibility, under-loading, gate keeping and procedural challenges could be deemed to be unsure with regards to their mean scores of 3.47, 3.49, 3.49, 3.23 and 3.43 respectively. Though looking at the mean score values of the variables that fell under the unsure scale, the values were high except gate keeping that was low (3.23).

Cost

The results obtained indicated that only one variable (inaccuracy with a mean score of 3.50) could be deemed to be of high effect while the remaining 9 variables such as accuracy, understanding, timeliness etc. could be deemed to be unsure by the respondents due to the mean score values of less than 3.50. Without gainsaying that giving inaccurate information could lead to re-work which no doubt will increase the cost budgeted for such a project.

Safety

In a related development, timeliness with a mean score of 3.50 could be deemed to be high effect in relation to safety while all the remaining 9 variables could be deemed to be unsure based on the respondents.

According to Dainty *et al*. (2006), construction projects are usually limited by cost and time, it becomes imperative for construction managers to convey appropriate information in order to ensure timely and cost effective measures are in place throughout the duration of projects which will eventually rub off on the safety in the long run.

3.2 Observations analysis

The results of the 15 construction sites is as presented below

Table 5: Effects of communication barriers on communication

VARIABLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Mean	Rank
Accuracy	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1
Timeliness	5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	4.9	7
Distortions	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1
Barriers in Accessibility	5	5	5	4	5	5	5	5	5	5	4	5	5	5	5	4.9	5
Under loading	4	3	3	3	3	4	3	3	3	3	4	4	4	4	4	3.5	8
Overloading	1	3	3	3	3	3	3	3	3	3	1	1	3	3	3	2.6	9
Procedural Challenges	5	5	5	5	5	4	5	5	5	5	4	4	5	5	5	4.8	5
Understanding	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1
Gatekeeping	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1

1-15= The 15 sites observed; **5=very high effect, 4= high effect, 3= moderate effect, 2=low effect and 1= no effect**

From Table 5, the communication variables observed on the sites were accuracy, Timeliness, distortions, Barriers in accessibility, under loading, overloading, procedural challenges, understanding and Gatekeeping. The effect of these variables on communication during construction was scored and the following were obtained. Accuracy, Distortion, understanding and Gatekeeping had a mean score of 5.0 each meaning that these variables had very high effect on communication effectiveness during construction. It can further be said that any disruption in these variables had a bad effect on construction in that works were delayed. Timeliness, Barriers in accessibility and procedural challenges had mean scores of 4.9, 4.9 and 4.8 respectively this means that these barrier had high effect on communication during construction. If information for work was not gotten on time, it had a bad effect on construction so also barriers in accessibility. Language barrier was seen as the worse barrier on those sites and procedural challenges had also a high effect on construction. If procedures for work were not understood or were unfamiliar with, this led to waste of time and resources most at times rework was unavoidable to correct this.

Under loading and overloading had mean scores 3.5 and 2.6 meaning that information under loading had a higher effect on construction. When information obtained for work was not sufficient, it discouraged workers because such works were unnecessarily delayed and this was seen to be a very common thing on the sites visited. Information overloading was not seen to be happening on most of the sites visited but was seen on two of the sites visited and when this happened workers already knew what was to be done and how; so it did not affect construction in any way. The results are consistent with the works of Xie, Thorpe and Baldwin (2000) in terms of variables of accuracy,

overloading, under-loading and timeliness while the results are not consistent with variables such as procedural challenges and accessibility barriers.

Modes of Communication

The modes of communication among parties on the different sites observed ranged from drawings, meetings, face to face interactions (verbal), instructions, Emails, Phone calls, Radio/walkie-talkie. The mode of communication was also dependent upon the size of site. Drawings, instructions, phone calls were seen being used regardless of the size of construction but the radios/ walkie talkies were used for construction which involved many floors or on constructions which covered large area and workers are far apart from one another.

Though many modes were being used, but drawings appeared to be the most effective and the most often used mode; since all that is required is on it and even when the supervisors or professionals were not available on site, the workers referred to them and did their work well without interruptions and such work when inspected were in order.

4 CONCLUSION

The paper examined the effects of construction communication barriers on project objectives in Abuja-Nigeria. Though many communication modes were being used on the sites which were depended on the size and the nature of the sites, the most effective was the drawings which had to be explained to the understanding of those involved to achieve aim and this worked well. Accuracy had very high effect on project objectives in the sense that if inaccurate information was given, it caused project delay (time), caused rework (cost) and also had effect on safety. Distortion had high effect on time because it is wasted in the process while timeliness had high effect on both cost and safety. To this end, information accuracy, distortion and timeliness should always be emphasised on since it have high effects on the project objectives.

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