

Factors Affecting ineffective Communication and Its Effect on Construction Projects

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Abstract

The Complex nature of Construction project always having a design separated from actual construction and its multi disciplinary professionals, demands an efficient and effective communication process. It has observed that ineffective communication has adversely affected construction project, thus, in answer to the clarion calls by the construction professionals this work examined the factors causing ineffective communication and its effects on construction project. Adopting survey research, a structured questionnaire on factors causing ineffective communication and its effect on construction project delivery was administered to professionals in the Nigerian construction industry. 75 questionnaires on a stratified sampling technique were distributed and 64 respondents representing 85.3% achievement. 32 factors were listed as the causative factors while 21 factors were listed as effect of ineffective communication in the Nigerian construction industry. Percentages, mean score and standard deviation were used in the analysis. Communication breakdown with a mean score of 1.63 ranked first while project failure with a mean score of 1.64 and standard deviation ranked first in the causative factors and the effect respectively. Communication plan should identify who, what, when and how information should be provided.

Keywords: Communication, Project, Construction, Client, Consultants, Contractor, Effect, Factors, Ineffective.

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I. Introduction

Construction projects have some particular attributes that set construction firms apart from other businesses. The complete nature of construction project always having a design separated from actual construction and its practice of adopting competitive tendering made the construction undertakings more difficult to manage. It is made up of multi-disciplinary professionals. Some of the varied disciplines that may be involved include: architects, builders, civil and structural engineers, quantity surveyors, electrical engineers, mechanical engineers, other artisans and other service staff like accountant and secretary. The project manager heads the group of professionals at the project site and is required to perform varied functions such as an intermediary between the owner/client on one side, the professionals and the contractor on the other hand.

Consequently a construction project manager should possess the ability to communicate effectively to all the parties towards the attainment of successful realization of the construction project in terms of cost, time and quality. The output of the construction project managers cardinal functions of planning, organizing, directing and controlling has to be communicated to those expected to accomplish the task. There are some responsibilities that are common to all project managers and must be communicated to those expected to accomplish the task.

The areas of communication are:

- Project plan
- Project stakeholder
- Communication platform channel
- Project team
- Project risks
- Project schedule
- Project conflicts
- Project delivery
- Contract administration

Ezenwa (2002) defined communication as the accomplishment of meaning and understanding between people either through the verbal or non-verbal means for the purpose of influencing behavior aimed at archiving an objective. Three fundamental construction elements must be associated with the process for communication to take place namely; communicator or sender, the receiver and the third being the platform/channel. It is only

when the intended receiver of an information interprets the information as intended, that communication is deemed to have taken place. A breakdown in communication occurs not only when the information fails to correctly interpret the received information.

A breakdown in communication is said to have occurred, when a site manager for instance instructed a project supervisor to produce a few more cubic meter of concrete and the supervisor proceeded to produce two more cubic meter of concrete when actually the site manager would have preferred five cubic meter of concrete. That apparent confusion demonstrates the inability of the site manager to effectively communicate his intentions, a management lapse that would adversely affect his chance of success and attainment of corporate goals. A weakness in any of the three communication components of sender, platform and the receiver has the potential of compromising the effectiveness of the communication process.

It is surprising that most construction project managers do not communicate to the project team why certain project were being undertaken, the objectives, the parties involved, the time scale, the constrains and the factors that are critical to its success. Lack of these essential information affects the attitude of the members of the project and affects the success of the project.

The construction project manager is in a position where he must issue directives and assert authority to peers and subordinates alike. It is essential that the construction project manger learns to use communication in such a way as to reinforce a sense of collegiality amongst members of the group rather than impose a sense of subordination that can only be counter productive. It is the responsibility of the project manager to use communication to provide avenues for ventilating grievances because one of the characteristics of the vertical communication within organization is the psychological distances that exists between management at the top and workers down the line. The construction workers need sufficient, appropriate, relevant and timely communication to contribute towards the construction project success.

The objective of this research is to identify and rank the factors causing ineffective communication in the construction industry and its effect on construction project delivery.

Method of Study

Extensive literature review was carried out in standard textbook, academic and professional journals to identify the factors causing ineffective communication and their effect on construction projects.

The questionnaire was structured in three sections. The first section seeks information about respondents' background such as specialization and years of professional practice. The second section was designed to capture the factors affecting ineffective communication in the construction project delivery. The third section was designed to ascertain the relevant effect of ineffective communication on construction project delivery. The distribution of the questionnaire was carried out based on expert judgment to the professionals in the construction industry. The questions were based on a five point likert scale of rating. The respondents were advised to choose from strongly agree, agree, undecided, disagree and strongly disagree both for the causative and the effect factors of ineffective communication on construction project delivery. Percentages, mean score and standard deviation were used in the data analysis.

Percentages: the data were reduced to the standard form with base equal to 100 through the use of percentages which in fact facilitates relative comparisons. In the comparison of factors, the higher the percentage rating, the higher or the comparatively more significant the importance attached to the factor.

Mean Scores

The mean score is a value which is typical or representative of a set of data. The mean score method involves attaching numerical values to each of the statement that describe the factor causing ineffective communication on construction projects in order to measure the intensity or degree of agreement by respondents. For example 2 = strongly agree, 1 = agree, 0 = undecided, -1 = disagree, -2 = for strongly disagree. The mean score for each item or factor was then determined from the scores and the number or frequency of responses for each score. Mathematically

$$\text{Mean score (m.s)} = \frac{\sum(axi)}{N} \quad (-2 \leq ms \leq 2)$$

Where

m.s = mean score

a = the respective weighting of the factors

x = the number of respondents for each weighting

n = the total number of respondents

\sum = capital Greek sigma which means summation; that is the sum of

The completed index of the items were compared to summarize the information. In investigating the causes and effect factors of ineffective communication in construction project, the weighted average formula was used in assessing respondent ranking of importance. The weighted average for each of the variables was

obtained from the sum of the product of the proportion of the responses received compared to the total number of receipts (n/N) and the corresponding index in respect of individual variable. The weighted average is given as:

$$WA = \sum \left(\frac{n}{N} \times m.s \right) \quad (-2) \leq m \leq 2$$

Standard Deviation

The degree to which the numerical data tend to spread about the average that is dealing with dispersion which is a statistical parameter of importance known as variance. The square root of the variance gives a statistic known as standard deviation. The term standard deviation is measured in the same unit as the variance and the mean which offers an advantage of easy interpretation. The standard deviation is most commonly used measure of dispersion. Mathematically the standard deviation used to measure the variation is represented as:

$$\sigma = \left(\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} \right)^{1/2}$$

Where:

- x_i = the number respondent for each weighting
- \bar{x} = mean
- n = total number of respondent
- \sum = capital Greek sigma which means summation, that is the sum of

Data Presentation and Discussion

Seventy five copies of the questionnaire were distributed to the professionals in the Nigerian construction industry (Imo & Abia) to both the technical staff and the non technical staff. Sixty four (64) responded to the questionnaire representing 85.33 percent of the respondents.

Table 1: Categories of Respondents

Organization	Number	Percentage
Client	12	18.75
Consultant	9	14.06
Contract	37	57.81
Others	6	9.38
Total	64	100

The analysis of the information in Table 1 shows that the respondents were more in the construction sector and therefore the background information supplied by them was deemed adequate and reliable.

Table 2: Factors affecting Ineffective Communications

Factors	Mean Score	Rank	Standard Deviation
Communication Breakdown	1.63	1	23.04
Channel of Communication	1.59	2	23.62
Poor Communication Platform	1.53	3	21.91
Communication Procedure	1.48	4	22.55
Leadership Skill	1.45	5	20.29
Poor Human Relationship	1.41	6	20.42
Lack of Meetings	1.38	7	20.85
Pressure of Site Work	1.33	8	19.18
Poor Construction Site Co-ordination	1.28	9	19.75
Lack of Participative Management	1.25	10	19.29
Misinterpretation of Instruction	1.22	11	17.47
Organizational Structure	1.17	12	16.48
Lack of Social get Together	1.13	13	16.99
Management System	1.09	14	17.21
Poor enabling Environment	1.05	15	16.66
Lack of Job Satisfaction	1.00	16	18.50
Style of Project Supervision	0.95	17	16.75
Lack of Job Advancement	0.94	18	15.37
Lack of Training	0.91	19	16.25
Ineffective Communication Strategy	0.88	20	14.25
Level of Education	0.83	21	15.25
Language Barrier	0.80	22	16.51
Intimidation on Sites	0.78	23	16.07
Lack of Job Orientation	0.75	24	13.94

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Lack of recognition	0.70	25	15.12
Informal Group Influence	0.73	26	15.63
Construction Experience	0.66	27	16.77
Poor Welfare Scheme	0.63	28	14.79
Nature of Construction Work	0.58	29	16.69
Lack of Trust Between Workers and Supervisors	0.56	30	14.31
Construction Activities	0.52	31	15.85
Lack of Health and Safety Procedures	0.50	32	14.45
Average	1.02		17.57

The information in Table 2 shows that among the 32 factors listed as affecting ineffective communication in the construction industry, the highest mean score is 1.63 which is communication breakdown. The least mean score is 0.50 which is lack of health and safety procedures, while the average mean score is 1.02. Fifteen Factors as shown from the table has a mean score of above 1.02 as seventeen Factors have a mean score of less than the average of 1.02. The highest standard deviation is 23.62, the common standard deviation is 17.57 and the lowest standard deviation is 13.94.

Communication breakdown ranked first with a mean of 1.63. Communication according to Ezenwa 2002 is the accomplishment of meaning and understanding between people either through the verbal or non verbal means, the purpose of influencing behavior aimed at achieving an objective. It is only when the intended receiver of a message interprets the message as intended that communication is deemed to have taken place. The project manager should receive only condensed, summarized and invariably comparative report covering all the elements entering into the management. There can be no communication vacuum there may be communication gaps and communication breakdown but people, just like nature abhor a vacuum. For project success, a project manager should endeavor to provide sufficient communication.

Channel of communication ranked second with a mean score of 1.59. Think of a communication plan as a road map for project stakeholders. Communication channel that will be used for the construction project delivery must be planned. It breaks down what kind of information that is required to be communicated, who should be given that information, the timeline upon which the information should be delivered and which communication channel will be used. The channel of communication needs to be established at the beginning of the project between the project teams, between the manager and the contractors between the client and the contractor. The issues to be communicated include variations, specification, discrepancies in the drawings including exchange of ideas in either memos letter etc.

Poor Communication Platforms ranked 3rd with a mean score of 1.53. Communication is a two-way traffic. As companies need to know how to report well, they need to be even better listeners. A good communication will enhance information collection, dialogue, decision/actions, and responsibilities. Generating ideas and formulating policies, brainstorming and roundtable conferencing is a most effective communication strategy. This involves cross fertilization of ideas as project participants are invited to analyse problems and proffer solutions to those problems facing the project group. It is important in the life cycle of the project for re-appraisal so that lapses may be detected. It is important to review and measure performances against goals and objective, determining causes of deviation and taking corrective actions were necessary. During end of project evaluations, roundtable conferencing is also useful in-addition to providing the platform for constructive post mortem analysis.

Communication procedure rank 4th with a mean score of 1.48. Effective communication plan is important in successful construction project delivery. A communication procedure needs to be established. One wouldn't just dive into a project without clearly defining scope, resources and timeline. There is need to know how, when and why e-mails, messages, intercom and other forms of communication are sent. When done properly a communication plan provides optimum clarity and serves as a tool that sets out clear objectives before a project commences.

Poor human relations ranked 5th with a mean score of 1.45. Corporate objectives are realized through people. People are managed to handle tasks that achieve goals. The inter-play of humans in the course of this process is human relations. Man as a management tool is generally referred to as human resource. The management of such as unique resources should therefore not be in the same league as those of the other types of resources. This resource is human and as such ethical, social, political, and emotional. It is all these situations acting both alone and in a group. A project manager based on these circumstantial constraints should rely on his skills as a manager, ability to relate well with people and leadership ability to achieve success. He is expected to utilize these skills to build and achieve positive morale within and among project team members.

Leadership skill ranked 6th with a mean score of 1.41. Expert opinions are often so divided on the subject of leadership style that it would amount to near mischievousness for one to select any as universal and most appropriate for the project manager. A school of thought has it that minimum level of friendliness or warmth from the leader would enhance greater productivity. Leadership is about change and coping with change

action. Be clear about each team member's role and tell people what is expected from them. Communication is the key to getting the result you want, never assume staff will automatically know what you mean.

Lack of meeting ranked 7th with a mean score of 1.38. The parties to the implementation of project are expected to formerly meet as soon as the formal contract arrangement formalities have been completed. The initial meeting ideally takes place on the site. The initial site meeting generally sets the tone of what to expect in the course of project implementation. The member that has the most knowledge of the project chairs and directs the first meeting, the role generally falls on the architect/engineer or the owner's project manager. Attendance to the meeting is by invitation and it is mandatory that proceedings be recorded. The agenda normally include:

- Anticipated factors and constraints that could impact negatively on the project
- Appropriate channels of communication especially with regard to issuance of instructions
- Matters with regard to appointments of sub contractors, compliance with statutory requirement like bond, insurance etc.
- General management of the works and work programme.

Pressure of site work is ranked 8th with a mean score of 1.33 and a standard deviation of 19.18. There is no other besides construction with a diverse mixture of individuals, the illiterate, the unskilled, the semi-skilled, the skilled and the highly educated professionals, simultaneously pursuing the realization of a construction project with time frame, cost and quality. Apart from satisfying these groups of workers, the clients, the consultant, the sub contractors are also mounting pressure on the project manager in pursuance of the objective of the project. It is only through effective communication that the pressure at the site will be reduced.

Poor construction site coordination ranked ninth with a mean score of 1.28 and a standard deviation of 19.5. A high level coordination is needed in construction activities. A foreman in the construction industry heads the craft unit, and report to a supervisor. Most supervisor attain their position from the foreman cadre, the trade supervisor is in charge of the number of construction activities and craft units relating to his trade. The site supervisor as distinct from trade supervisors co-ordinates the work of the various craft foremen through the sectional supervisor, and in turn report directly to management or to a project manager depending on the size and complexity of a project or a company organization set up. The set up demands for co-ordination meetings to be regular in order to make communication effective.

Lack of participative management with a mean score of 1.22 and a standard deviation of 17.47 ranked the 10th. Brainstorming and roundtables conferencing are called for at three distinct stages of a project. The conceptualization stage, the mid-stream stage/re-appraisal stage and the end of project evaluation stage. Planning which itself can be broken down into many steps is concerned with the future implications of current decisions and enables an organization to control circumstances, to make things happen rather than to let things happen and then react in a crisis mode. To generate ideas and formulate policies, brainstorming and roundtable conferencing is a must effective communication strategy.

The other factors affecting effective communication are shown in the information in Table 2. The indexes of preponderance indicated alongside with the mean score. The other factors that ranked between 30th and 32nd are as discussed below.

The 30th rank in the index of preponderance is lack of trust between the site workers and the supervisors. When the group cohesion is strong because of the trust between workers and supervisors, the morale also tends to be high. There are close correlation in the positive direction between group cohesion and morale. If a group is at loggerhead with self, or individuals have conflicts and battles among themselves, their morale will be affected and they are likely to achieve ineffective communication in their construction project.

Construction activities with a mean score of 0.52 and standard deviation of 15.85 ranked 31. Construction activity is saddled with its unique hazard and risk elements. The construction contractor assumes these risks coupled with the design, most of the time separated from actual construction makes the communication and management difficult.

Lack of health and safety procedures in the construction project delivery ranked 33 with a mean score of 0.50 and a standard deviation of 14.45. Good housekeeping on a project site is both a safety measure and an indicator of good project supervision. The programme and the spirit of compliance and sustenance of safety measures must emanate from effective communication.

Table 3: Effect of Ineffective Communication

Effect	Mean	Rank	Standard deviation
Programme failure	1.64	1	21.63
Cost overrun	1.61	2	23.04
Time overrun	1.58	3	21.42
Quality degradation	1.48	4	20.34
Unsafe practice	1.45	5	20.80
Rework	1.42	6	19.82
Poor productivity	1.36	7	18.14
Poor human relations	1.34	8	19.84

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Unsatisfactory performance	1.33	9	18.76
Disruption in work profess	1.28	10	18.95
Poor contract	1.23	11	18.05
Poor contract administration	1.20	12	16.93
Problem of good will	1.20	13	17.60
Non compliance	1.20	14	18.35
Discrepancies In design	1.02	15	16.45
Construction site accidents	1.02	16	17.24
Defective construction	0.98	17	15.96
Implementation of programme of work	0.95	18	13.94
Poor health and safety management	0.91	19	16.13
Frustrated work force	0.88	20	15.09
Obstinate nature of construction	0.81	21	14.20
Average	1.23		18.22

The information in Table 3 shows the analysis of the 21 effect of ineffective communication in construction project delivery; the highest mean score is 1.64 and a standard deviation of 21.63. The average mean score is 1.23 and the standard deviation for all the factors is 18.22. The least mean score is 0.81 with a standard deviation of 14.20. Ten factors were below the average mean score while 11 factors were above the average mean score.

1. Programme Failure: the analysis of Table 3 shows that programme has a mean score of 1.64 and a standard deviation of 21.63 to rank first in the Table. Programme management in construction activity encompasses the project design and the construction management of the project. The construction manager is based at the job site dealing directly with the contractor. Large programmes require the management, co-ordination and integration of multiple concurrent assignment from concept through completion and this can only be achieved with effective communication.

2. Cost overrun is the second in the rank. It is a common effect of ineffective communication in construction projects. Ineffective communication occurs in the modification of the design, changes in specification, additions to the scope of the works during the design and construction phases usually lead to increase in cost.

3. Time overrun is the third in the order of preponderance. There is often a prolongation of projects completion time as a result of time granted because of ineffective communication. A frequent outcome of ineffective communication in construction projects is completion time delay.

4. Quality Degradation is the fourth in the Table. The standard and kind of materials for incorporation into the works and the levels of workmanship are usually specified in the project. Frequent ineffective communication compromises the project quality standards. If deviations or variances from set standards are noticed or anticipated actions should be put in place to effectively communicate the anomaly.

5. Unsafe practices is any behaviour that an employee engages in without regard to safety rules, standards, procedures, instruction and specific criteria in the system. The processes in construction is more likely than others to breed unsafe behaviours and based on this background of construction practice, a systematic analysis of unsafe practice need to be effectively communicated to the construction workers.

6. Rework: During the construction phase, ineffective communication imposed on aspects of the work that have been carried out lead to demolition and rework. The construction project manger should provide a documented design process; procedure or materials change implemented and validated to correct the cause of the failure or design deficiency.

7. Poor Productivity: Productivity as commonly understood implies the ratio of output to input. Various terms connected with productivity are workers productivity as quantity of work done per man hour, material productivity as quantity of work done per unit of materials and equipment productivity as quantity of work per equipment hour. The various productivity parameters which need to be controlled with effective communication in construction projects are labour productivity, equipment productivity and material productivity.

8. Poor Human Relations: Human society had long realized that people must interact in an organized form to achieve societal goals. A project manager based on these circumstantial constraints should rely on his skills as a manager, ability to relate well with people and leadership ability to achieve success. He is expected to utilize these skills to build and achieve positive morale within and among project team members. The skill and ability to build and sustain morale within a project team does not come easily. It is a project manager's dream. Its professional success hinges heavily on that through effective communication

9. Unsatisfactory Performance: Project performance focuses on the successful accomplishment of the project cost, time and quality which can be measured in terms of meeting project established budget, schedule and conformance to functional and technical specification. The evaluation of the impact on project performance include functionality and non variation in the project.

10. Under Utilization of Equipment: Plant and equipment are usually employed in construction project. An ineffective communication problem can affect project completion due to unavailability of equipment, specifying

the wrong equipment for a particular activity. This could give rise to alteration or modification of the design thereby necessitating variations due to ineffective communication between the equipment manager and the site supervisor.

11. Disruption in work progress: ineffective communication to construction plans introduced during the construction phase may affect the project progress. This may lead to disruption. The free floats in the work programme may not accommodate the disruptions caused by ineffective information.

12. Poor Contract Administration: This could result from inadequate scope of work for the contractor. Without first hand knowledge of the actual project requirements due to ineffective communication, the contractor may proceed with construction activities based on his interpretation of the concept. This could cause variations eventually as such misinformation may adversely affect the quality of works.

13. Problem of Goodwill: During the construction phase, special care must be taken to avoid communications that transcend the contractual lines of privity. Subcontractors should not communicate directly with the project consultants but should approach the contractor's project manager. Most problems on the site have a larger impact than just the particular subcontractor's work and perspective to discern the full impact of the change or concern. There is often informal communication between parties; however, throughout the construction process, considerable communication takes place between the sub-consultant and subcontractors that may be technical in nature and may be misconstrued if transferred through several parties.

14. Noncompliance: The design and construction phases of construction projects are traditionally separated, with the contractor involved in the construction phase. The contractor's expertise in construction methods and technique is not explored during the design phase because of the contractor's non involvement in design. Briefs received from persons without first hand knowledge of the project concept is regarded as ineffective communication and it is a non compliance to project standard.

15. Discrepancies in Design: It is usual for shop drawings to be developed for construction work details for site professionals. Discrepancies might arise between the architectural drawing and the structural drawing or between the electrical engineering drawing and the mechanical engineering as a result of ineffective communication. Absence of effective communication between professional consultants could result in discrepancy in the contract document.

16. Project Abandonment: Problems such as differing soil conditions, not foreseen during conceptualization and design may cause major communication problem during the construction phase. Professionals in the construction industry usually encounter unforeseen conditions. In the absence of immediate resolution of such problems, abandonment may arise.

17. Construction Site Accident: Occupational Safety and Health Administration (OSHA) requires detailed periodic reports and the use of prescribed forms. The construction company's accident form must be completed within 24 hours of occurrence. The accident report may also be treated as safety communications with specific requirement for posting to the employees.

18. Defective Construction: Errors in items description or in quantities and omission of items in the contract document which are not rectified and treated as ineffective communication leads to defective construction.

19. None Implementation of Work Programme: Construction projects involve many human and non-human players and variable. Construction projects have complex relationship among the participants. The scope of work for all the participants must be clear and unambiguous for a successful project completion.

20. Poor Health and Safety Management: Various statutory bodies make provisions for workmen safety at construction sites. Non compliance to safety considerations in designs and methods of construction due to ineffective communication will affect the successful completion of the construction project.

21. Consultant and Contractor Obstinacy: Consultants unfavourable disposition to the use of certain materials and equipment or to the introduction of new methods of construction could be due to ineffective communication. The contractor might be unfavourably disposed to the creative ideas of other participants regarding construction method and techniques as a result of ineffective communication, where such ideas are beneficial to the realization of the project.

II. RECOMMENDATIONS

1. Effective communication in construction projects builds a better relationship between clients, consultants and the contractor.

2. Ineffective communication has adverse effect on construction projects

3. Effective communication in construction projects leads to innovation and better technical solution.

4. Communication breakdown is one of the major factors affecting effective communication in construction project delivery.

5. Communication tools and methods should be made available at the commencement of construction project for effective communication.

6. Communication plan should identify who needs what information, when they need it and how that information should be provided.

III. CONCLUSION

An effective communication plan is very vital for the execution of a construction project. The efficiency and effectiveness of the construction process strongly depend on the quality of communication. A weakness in any of the three communication components, of sender, channel/platform and receiver has the potential of compromising the effectiveness of the communication process.

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