

Establishing the relationship between construction project managers' skills and project performance

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Earlier studies measured project performance based on cost, time and quality but limited number examined whether construction project managers' skills influence the level of client overall satisfaction. In lieu of this, the paper examined whether construction project managers' skills influence client satisfaction on construction projects performance within the Nigerian construction industry. Key project management skills were obtained through the review of literature. The study data were obtained through a questionnaire survey and case study projects. The data collected were analyzed using descriptive and inferential statistics. The study revealed that the construction project management skills that would engender good project performance are leadership, communication, organization and technical skills. It also emerged that there is a partially significant relationship between the level of skills possessed by construction project managers and overall customer satisfaction on project performance. The paper concludes that there is tendency for the satisfaction of customer/client on construction project to increase as the general skills possessed by the construction project manager also increases and vice versa.

Keywords: construction project, construction project manager, project management, management skills, project performance

Introduction

The construction industry covers a wide field of operation from the very large civil engineering projects such as highway construction to large building projects. Ghaleb and Hisha (2007) observe that project management started as a profession in the 1950s due to the increase in project complexity and the need to manage multiple projects at several locations. The application of project management concept is an essential tool for planning, organizing and controlling work activities, which lead to better performance and increase in productivity. According to Thain (2001), project management as it is currently practiced, was developed originally in the construction, engineering and technical fields but now have wide ranges of applications. It was emphasized that most project managers' start with technological training aspect of projects, but frequently lack of knowledge on the managerial functions necessary to manage project works well posed significant challenges. According to Rwelamila (2007), builders, architects, quantity surveyors and civil engineers become accidental project managers due to their expertise and technical skills. Rwelamila reiterates that the technical part of a construction project is often the easiest and that technical success does not necessarily sufficient to lead construction project into success.

Project managers in construction are responsible for the overall success of the project, which includes delivering the owner's project within the constraints of time, cost, quality and safety requirements. Researches and observation of industry practices by Ahmed and DeBesaram (1998) suggest that the fundamental cause of project failure can be reduced to two general areas. First, projects are successful because the expectations of the stakeholders are met and conversely, projects are unsuccessful if such expectations are not met. The more expectations are missed or the greater the extent that these expectations are not met, the greater is the perceived failure of the project. Secondly, projects fail because communication within and on the projects is ineffective. Shenhar et al. (1997) note that project managers increasingly find themselves accountable not just for the technical content of the project as expressed by the engineering and construction accuracy, reliability of facility and within-cost performances, but find themselves confronted with issues and undertaking additional roles that are traditionally not been part of their responsibility.

Consequently, there arise a need to evaluate the skills and knowledge required by construction project managers that enables them undertake their project responsibilities into successful conclusion. The study reported in this paper therefore examines construction project managers' skills and whether the level of skills possessed by construction project managers can be related to project performance in terms of client satisfaction. To guide the direction of the study, it is hypothesized that there is a significant relationship between the level of skills possessed by construction project managers and client satisfaction.

This study is significant because it will provide information as to the need for construction project managers to possess certain skills which are not technical but often managerial for successful delivery of construction projects. It will also help employers and clients in the construction industry about the need to engage the services of construction project managers with the appropriate skills and competencies. This scope of the study is limited to construction professionals and projects based in Lagos metropolis.

Overview of Project Management Skills

The construction project manager's principal responsibility is to deliver a project within budget and time limitations and in accordance with technical specifications, and when specified in fulfillment of project objectives. Chen (1997) opines that these responsibilities and skills combine with the traditional engineering knowledge of the construction project managers to produce a different angle of project management. Furthermore, projects in construction cover several areas of specialization. It is expected that construction project managers who specialize in building works, will not necessarily be specialists in water engineering projects. However, acquiring the knowledge inputs for a particular type of project area enables the construction project manager to develop two types of skills. These are specific skills, which relate directly and only to construction projects, and in particular the areas that reflect their specialty, and general skills, which are transferable from the construction arena to other fields, but more importantly from one area of construction to another. The general skills provide much of the foundation for developing project management skills. They are often essential for the construction project manager to function effectively within specific areas of specialist knowledge. These skills can be classified according to literature into managerial, technical, personal effectiveness and legal skills (Dainty et al., 2005)

Managerial Skills

These skills include:

- Leadership – providing leadership by establishing direction, motivating and inspiring subordinates,
- Negotiation – assigning issues of scope, cost and schedule objectives to responsible parties and agreeing on this,
- Problem solving – most scholars agree that there is a need for a project manager as a single point of authority in the project delivery process to have problem solving skills (see Turner, 2009, Morris, 2000, Hamilton, 1997, Gabriel, 1997). Problem solving involves a combination of problem definition and decision-making (Edum-Fotwe and Mc-Caffer, 2000),
- Project decision-making which is essential in making meaningful strategic progress on a project,
- Communication skills – this involves the exchange of information. According to Association for Project Management (2000), an effective communication plane is often developed at the beginning of a project. It is a broad skill that involves a substantial body of knowledge that is not unique to the project context.

Technical Skills

In a study on project management effectiveness, Hyvari, (2006) defines technical competence as the competency to use project management tools and methods to undertake projects. Although it appears that technical competence is not as significant as other project management skills in predicting project success, its importance within literature still draws the expectation that the level of technical competence possessed by a project manager will positively influence the level of success that the project manager achieves.

Personal Skills

According to Dainty et al. (2005), the skills contained within this cluster all share a common theme in that they reflect intellectual and behavioural maturity in relation to others and to work. Of particular relevance to the superior performing managers was the ability to demonstrate self-control, remain composed, restrain negative actions, and cope well even when confronted with stressful situations. Dainty et al. (2005) further stressed that another important skill within these cluster is flexibility, the ability to adapt and work flexibly within a variety of situations, individuals or groups. This skill has two sub-dimensions, breadth of change in terms of the ability to adopt different organizational strategies and speed of change relating to their ability to refocus and adapt their behavior to new situations that demand it.

Legal Skills

Managers in general including construction project managers have to deal with laws, systems, legislation and charters that govern relationships and regulate management processes (Abouen et al., 1998). Handy (1993) points out that organizations operate in the context of national politics, which influence the function of all members of an organization and if these organizations are looking for success, they have to take these changes into account.

Method

In order to achieve the objectives of this research, a review of extant literature, which formed the basis of the empirical research, was done. The study employs a sequential mixed method research design approach in eliciting data. The area of study focused basically on Lagos metropolis due to the fact that it is one of the major hubs of construction activities in Nigeria. The target population for the study were the project clients and construction project managers of the on-going active projects within the study area. The sample used in the survey was selected from a sample frame of on-going projects approved by local planning authorities using the random sampling technique, as all cases have equal chances of being included in the sample and therefore yielding greater validity and reliability. Out of one hundred and forty (140) self-administered questionnaires distributed to construction project managers working on the identified construction projects, one hundred and eighteen (118) were completed and analyzed. The study also selected twenty (20) projects as case studies. Participants in the primary study and who agreed that their clients could be included in the survey are handling these case study projects. Therefore, two questionnaires – one for the construction project manager and another for clients were prepared as main instruments for data collection in the study. The construction project manager's questionnaire consists of three sections A, B and C. While Section A interrogates the background of the respondents, Section B sought to know the project management skills used on projects and those possessed by the construction project managers, and Section C probes the performance of the projects on which the construction project managers were supervising. The client's questionnaire consists of two sections A and B. While Section A sought to know the background information of the clients, Section B interrogates the level of client satisfaction with the project.

The data collected were analyzed using descriptive and inferential statistics. Consequently, the method of data analysis employed the use descriptive and inferential statistics such as frequency distribution, mean item score (MIS) and chi-square in analyzing responses obtained from a Likert scale and in generating relevant indices with regards to perceived project management skills and test the significance of relationship between level of skills and project performance respectively. The hypothesis generated to guide the direction of the study was tested using the Chi-square test of association. These analyses were done with the aid of SPSS 20. The MIS involves assigning numerical values to respondents' ratings of factors e.g. very important (5 points), important (4 points) etc. The mean score for each factor is then calculated from the following equation:

$$MIS = \frac{5N_5 + 4N_4 + 3N_3 + 2N_2 + 1N_1}{5(N_5 + N_4 + N_3 + N_2 + N_1)}$$

Where N_5 , N_4 , N_3 , N_2 , and N_1 are number of the respondents who picked 5, 4, 3, 2 and 1 ratings respectively.

Data Analysis and Discussion

The data collected in the study will be presented and analyzed under the following sub-headings:

Background Profile of the respondents

The study sought to know the background profile of the respondents that were used in the study. The respondents' position in the company, work designation, academic qualification, number of years of work experience and level of project management skills possessed are presented in Table 1. It can be seen from Table 1 that a significant percentage of the respondents (52.5%) work as project managers in their respective organisations, half of the respondent population are architects, 44% and 42% hold Masters and Bachelors degrees respectively, 53% hold more than 11 years of work experience – the number of years of experience possessed by the respondents may be reflective of the long period of experience required to attain the status of a project manager within the construction industry, while 59.2% of the respondents can be classified as highly skilled, i.e. they have at least four general knowledge skills out of the eight skills identified in literature.

Table 1: Distribution of Respondents by Position in the Company, Work designation, academic qualification, work experience and level of project management skills

Background Profile of Respondents	Response	Percentage Response (%)
Position		
Project Manager	62	52.5
General Manager	27	22.8
Senior Project Manager	15	12.7
Project Director	14	11.9
Total	118	100
Designation of Respondent		
Architect	59	50.0
Civil Engineer	31	26.3
Builder	17	14.4
Quantity Surveyor	11	9.3
Total	118	100
Academic Qualification		
PhD.	3	2.5
M.Sc.	52	44.1
B.Sc.	50	42.0
HND	13	11.0
Total	118	100
Years of Work Experience		
< 5 years	3	2.5
6-10 years	52	44.1
11-15 years	50	42.0
16-20 years	13	11.0
> 20 years	-	-
Total	118	100
Level of Skills		
Highly skilled (4 skills and above)	70	59.32
Moderately skilled (3 skills)	30	25.42
Low skilled (2 skills and below)	18	15.25
Total	118	100

Perception of Key Project Management Skills

The respondents were asked to rate whether the eight project management skills identified in literature are essential in construction project management process and for effective project performance. This was done through the use of a five Likert scale spanning from 1 not important to 5 for very important. The mean score was used to rank the project management skills identified from literature in order of perceived level of importance. The responses collected are summarized in Table 2.

Table 2: Perception of Essential Project Management Skills

Type of Skill	Rating Scale					Mean Score	Rank
	Where 5 = very important & 1 = not important						
	5	4	3	2	1		
Communication	114	4	0	0	0	0.993	1
Leadership	61	57	0	0	0	0.903	2
Decision making	59	59	0	0	0	0.900	3
Problem solving	48	70	0	0	0	0.881	4
Technical	67	20	31	0	0	0.861	5
Personal effectiveness	61	30	27	0	0	0.857	6
Negotiation	42	54	22	0	0	0.833	8
Legal	33	60	25	0	0	0.813	10

Table 2 further shows that the management skills perceived to be significant for a construction project manager to be successful in construction project management is communication which has the highest MIS of 0.993, followed by leadership skills and decision-making. The least significant amongst the skills identified is the legal skills.

Relationship between projects management skills and performance

The study sought to test the hypothesis that, whether there is a significant relationship between the level of skills possessed by the construction project manager and the skills possessed. This hypothesis is exploratory and was stated to guide the direction of the study. The data collected and used in testing the hypothesis was obtained from 20 case study projects handled by project managers in the parent sample and who agreed to further studies. The data collected from these projects from the clients and construction project managers are presented in Table 3 and 4.

Test of Hypothesis

The chi square test on the degree of association between the level of skills possessed by the construction project manager skills and project performance – which is based on the client's satisfaction with construction projects is presented in Table 5 and shown graphically in Figure 2. Results on Table 5 indicates that the chi square value (34.28) is significant at $p < 0.05$. However, figure 2 shows that the relationship between level of skills possessed by construction project managers and client satisfaction with project is partially significant. Based on these findings, the study null hypothesis is rejected and the alternative hypothesis which states that there is a relationship between the levels of skills possessed by the project manager and project performance (level of satisfaction of the client) is accepted. Moreover, the relationship is partially significant. Furthermore. This implies that there is tendency for the satisfaction of client on project to increase as the general skills possessed by the construction project manager also increases and vice versa.

Table 3: Performance and Number of Skills possessed by Construction Project Managers on the multi-case study Projects

Project	Degree of client satisfaction (Performance)	No of skills possessed by construction project manager
1	1	5
2	1	4
3	2	5
4	2	4
5	3	4
6	4	6
7	1	4
8	2	4
9	4	6
10	3	5
11	3	6
12	2	5
13	2	4
14	1	6
15	3	3
16	4	5
17	3	6
18	2	4
19	4	5
20	4	4

Key: Degree of client satisfaction – where 1 = highly dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied and 5 = highly satisfied.

Table 4: Level of client satisfaction (project performance) with the project

Degree of client satisfaction	Frequency	Percentage (%)
Highly satisfied	0	0
Satisfied	5	25
Neither satisfied nor dissatisfied	6	30
Dissatisfied	5	25
Highly dissatisfied	4	20
Total	20	100

Tables 3 and 4 show that only 25% of the responding project managers' clients were satisfied with the project. The other clients were either neutral or dissatisfied with the projects.

Table 5: Chi square test result of relationship between construction project manager skills and project performance (client satisfaction with construction projects)

Variables compared	X²	df	P-Values	Decision
Construction project managers' skills and project performance (client satisfaction)	34.28	9	0.000	Highly significant



Figure 2: Graphical presentation of relationship between levels of construction project manager skill set and project performance (client satisfaction on construction projects)

Discussion of Findings

The study examines project management skills significant to construction project managers and whether the level of skills possessed by construction project managers influence project performance. The analysis of the data from the field survey enables deduction to be made and inferences from the hypothesis stated to guide the general direction of the study. In terms of skills possessed, it emerged that the ability to communicate, make decisions and assume leadership positions are the most important skills that should be possessed by effective project managers. Previous findings by Teixeira (2006) and Dainty (2005) support the outcome of this study. Teixeira in his survey of construction firms, found that communication – that is, the ability to interact effectively with others at all levels within and outside the organization is the most critical skills for project managers, followed by decision making and leadership skills, while Dainty found that leadership communication and decision making skills are the highest ranked skills possessed by project managers which impacts on their effectiveness.

A hypothesis was postulated to test whether there is a significant relationship between the number of skills possessed by the construction project managers and project performance. The result of the analysis showed that there is a partially significant relationship between skills possessed by the construction project managers and project performance and that there is tendency for client satisfaction with the project to increase as the skills possessed by a construction project manager increases.

Conclusion

The study identified the key project management skills that should be possessed by construction project managers and whether the number of skills possessed could be related to project performance. It can be implied from the results of the study that the more skills possessed by construction project managers, the more satisfied that clients will be with the project delivery. The results also imply that the key skills that should be nurtured by construction project managers should be in the area of communication, decision-making and leadership. There is therefore a need for construction project management programmes to equip the would be professionals in the demand for the critical skills settings for future construction project performance. Therefore, for construction project managers to cope with the competitive and dynamic nature of construction projects, their training should address communication skills, decision-making and leadership. Further research should explore the mode of training of construction project managers and how these soft skills can be learnt.

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