

EFFECTS OF QUALITY MANAGEMENT ON PROJECT SUCCESS IN CONSTRUCTION COMPANIES: A STUDY OF JULIUS BERGER PLC

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Abstract

This paper examined the effects of quality management on project success in Julius Berger Plc. in Nigeria. The study employed survey research design using questionnaire to collect data from all categories of workers in Julius Berger Plc. Fifty- two respondents responded to the questionnaire using simple random sampling technique. Two hypotheses were tested using correlation and multiple regression analysis. The findings revealed that 74.8 per-cent of the success recorded in timely delivery of projects could be attributed to customer focus. Also there is a positive relationship between project quality and client satisfaction. It was recommended among others that to successfully manage construction projects, the quality management teams are expected to closely examine and establish those factors that are critical to the success of their projects.

Keywords: Quality Management, Project Quality, Customer Focus, Project Success

Introduction

Construction industry is a major factor in the social and political integration of the society and ranks as one of the major budgetary areas of developing economies (Nwachukwu, 2008). Managing project can be seen as one of the oldest and most respected accomplishments of mankind. This is shown by the achievement of the builders of pyramids, the architects of ancient cities, the mason as well as the craftsmen of Great Wall of China with other wonders of the World (Peter, 2001). The success of project is often associated with the final outcome of the project. Project make up around 50% of all work carried out and as a result is deemed the vehicle for the execution of organizational growth, (Akarakiri, 2007). The accomplishment of project through the application and integration of the project management process of initiation, planning, executing, monitoring, controlling and closing, is known as project management. It integrates these functions through project life cycle with the

aim to satisfy the stakeholders and constituents according to the project have established requirements, (Peter, 2001). Project success is typically generated when the stakeholders and constituents express their collective satisfaction according to the degree of their involvement.

Every project is unique in its own way and it is temporary in nature i.e. it may end at some time (Olateju, 2011). In order to plan and manage a successful project, time, cost and quality should be considered to attain client objectives, (Hughes and Williams 2010). Quality has remained in the forefront amongst factors used to determine the degree of success or failure of a project. Quality management has become an indispensable and a globally pervasive strategic force in today's dynamic business world. The increasing intensity of construction projects has made quality management a prerequisite for project success, (Femtime (2003). The increasing trend towards implementing quality programmes in the logistics industry has led the construction industry to follow suit. As a result, construction companies have been making progressive efforts to design and implement comprehensive quality assessment and improvement strategies or programmes with a view to improving performance, competitiveness, and customer satisfaction (Minahan, 1998). Construction projects are commonly acknowledged as successful when they are completed on time, within budget, and in accordance with specifications and to stakeholders' satisfaction, (Kahura, 2013).

Like other industries, the construction industry is confronted with traditional and new challenges, which prompt the companies to seek improvement through quality management in the performance of their core processes and services in order to stay competitive, (Cheng & Choy, 2012). Studies have shown that the major failings in traditional approaches to project delivery have been in extensive delays in the planned schedules, cost overruns, serious problems in quality, and an increase in the number of claims and litigation associated with construction projects. According to the latest reports from the Ministry of Public Works, (Leadership, 2008) contractors in Nigeria give poor service through poor documentation, poor decision making and extension of time variation during project implementation leading to stalling of projects or total failure.

Nwachukwu, Echeme, & Okoli, (2010) opined that the rate at which building construction projects fail, or are abandoned, and the collapse of buildings, some even under construction, is retrogressive in a developing economy like Nigeria. The actual number of collapses buildings in Nigeria could be higher than what is on record since the figures published are based only on reported cases, (Ayininuola & Olalusi 2004). It is often concluded that deficiencies in

buildings are as a result of poor architectural or structural designs, participation of quacks parading themselves as professionals, use of substandard materials and lack of sufficient technical expertise on the part of builders (Leadership, 2008). Also, According to Kasimu and Usman (2013) majority of the construction projects such as roads, rails and drainages etc. in Nigeria experience time and cost overrun which in turn lead to the abandonment of projects. Many construction projects suffer from delay. Delay gives rise to disruption of work and loss of productivity, late completion of project increased time related costs, and third party claims and abandonment or termination of contract. It is important that general management keep track of project progress to reduce the possibility of delay occurrence or identify it at early stages (Martin, 2002). Construction planning has to be much more decentralized activity to cope with the inherently uncertain nature of task duration.

These are as a result of unexamined assumptions of poor quality management practices used in the project management process in Nigeria. The process of bringing new projects on stream and market imposes demands on established organizations and necessitates different management techniques 'from those required to maintain day to day operations. Wong (2009)' opined that construction companies are increasingly adopting total quality management as an initiative to solve quality problems in the construction industry and to meet the needs of the client and end-user. In Nigeria, little research has being carried out in the construction industry with regards to project quality management. However, this study tends to fill the gap in literature by studying the effects of quality management on project success.

The main objective of this study is to determine the effects of quality management on project success. The other specific objectives are;

- To evaluate if customer focus has an effect on timely delivery of project.
- To investigate if project quality has an effect on client satisfaction.

Based on the objectives, the key research hypotheses addressed in this study are;

- Customer focus does not have effect on timely delivery of project.
- There is no relationship between project quality and client satisfaction.

Literature Review

Theoretical Framework

Edwards Deming developed a quality management theory that would have transformed the style of American management (1982, 1986 cited in Oswald 2009), rather his ideas had a major effect on Japan where he was invited to teach about quality and productivity in the early 1950's. Deming convinced the Japanese business community that it was always cheaper to do the job right the first time than to let defects enter the production line. His advice was that focusing on quality, and producing products that did not fail, could make them a force in the world market. As the years went by, Japan's economic strength increased dramatically as it rose from the ashes of the war to an enormous industrial power in the world. Deming's emphasis is on product reliability, achieved through statistical analysis and worker-management cooperation. Deming believes that quality is a learning process and American managers must take responsibility for control of quality and for boosting productivity. By applying Deming's teachings, significant improvements in productivity have overcome difficult times (Buckman, 2009).

Deming's approach to quality management theory also focuses on "customers" as measures of achievement. In this sense, customers' ideas must be taken seriously and transformed into actionable information to evaluate the impact of the improvement efforts and to reinforce the customer focus within the organization. In order to achieve customer satisfaction, the quality process must be improved continuously until customer demands are met. In addition, Crosby (1992) emphasizes what he terms the "Four Absolutes of Quality Management" which must be understood by every person in an organization: (1) Quality means conformance to requirements, where management establishing requirements and providing employees the means to meet them; (2) Quality comes from prevention" rather than through inspection; (3) Quality performance standard is zero defects;" and (4) Cost of quality or "quality measurement is the price of non-conformance, (Crosby, 1992). Deming (1986) believes that quality is whatever the customers expect. He urges companies to involve workers in decision-making process.

Feigenbaum (1991 cited in Hassan, Mukhtar, Qureshi and Sharif, 2012) believes that quality is an organization's best investment in competitiveness. He defines quality as a way of managing and that customer satisfaction, lower costs, and the effectiveness of human resources are dependent on quality control. In order to improve the quality control process, he stresses the critical aspects of careful planning, product design, customer feedback, and the use of statistical tools. During the life cycle of this quality process, from the first

stage of gathering product requirements until the last stage of product delivery, customers' expectations must be met. Ishikawa (1991 cited in Saeed & Hasan, 2012) approach to quality is built on Feigenbaum's concept of total quality. He defines total quality control as a system of production methods which produces quality goods and services that meet the needs of the consumers. He defines quality as the participation by all workers from top down, from the top management to the front line staff, so that all workers have a greater role to play. He also believes that quality begins with the customers and that the workers must be empowered to undertake the improvement efforts that meet the needs of the customers.

Conceptual Framework

Akarakiri (2007) defines project as any scheme, or part of a scheme for investing recourse which can reasonably be analysed and evaluated as independent unit. A project is a group of tasks, performed in a definable time period, in order to meet a specific set of objectives, (PMI, 2005). It is likely to be a onetime programme. It has a life cycle with a specific start and end date. It has budget and likely to require the use of multiple resources, most of which may be scarce and have to be shared among others. It may require the establishment of a special organization or the crossing of traditional organizational boundaries (Harvey, 1999). Chapman (2003) defines project as the investment of capital in a time bound intervention to create assets. Probably the simplest definition is found in the project management Body of Knowledge (PMBOK) guide of the Project Management Institute (PMI). PMI is the world's largest professional project management association, with over 200,000 members' worldwide as of 2005. In their PMBOK guide, a project is defined as a temporary endeavour undertaken to create a unique product or service (PMI, 2010). The Project Management Institute (2010) defines quality as "the degree to which a set of inherent characteristics fulfill requirements". To the client, quality may be defined as one of the components that contributes to value for money (Flanagan and Tate, 1997).

Vincent and Joel (1995) define quality management as the integration of all functions and processes within an organisation in order to achieve continuous improvement of the quality of goods and services. The goal is customer satisfaction. Furthermore, in order to achieve successful project quality management three separate drivers to quality management must be managed, namely:

- a) Integration of the project team so as to have a single objective and a common culture.

- b) A customer focus for the team thereby facilitating the provision of products and services that will meet the client's needs
- c) A process of continuous improvement in the management of the constructing the project. When these three components are successfully integrated, the project will begin to realise significant, measurable and observable improvements in the attainment of the clients' objectives.

Oakland (2005) mentioned that quality started with the understanding of customer needs and ended when those needs were satisfied. Mauch (2010) believes that the rise of complex organizations in modern times triggers the need for improving the implementation of quality management and the ability to measure it. Quality Management discipline is becoming more concerned with performance reporting to a diverse management audience. The greatest effects found were the combination of adopting quality and a management performance evaluation system.

Mauch (2010), the strategy for improving customer satisfaction is not just only about planning and executing a massive and transforming project in organizations; it's also about doing little things every day with every customer, to make their experience better. It makes an enormous difference in how customers perceive the business; therefore, the owners and leaders of the business must be truly committed to it. He emphasizes that a successful projects especially construction companies must consistently give its best performance to attract and retain its customers, because they are its proof of profits and success, not only in monetary terms, but also because they act as voluntary advertising, telling others about the quality of the products and services provided by the company.

Gitomer (2008) goes a step further by emphasizing that improving customer satisfaction leads to customer loyalty. He apparently believes that customer loyalty comes from superior and quality service by exceeding customer's expectations. The strategy for improving clients' satisfaction is not just only about planning and executing a massive and transforming project in organizations; it's also about doing little things every day with every customer, to make their experience better.

Quality management focused not only on product/ service quality but also means to achieve it, (Kenneth, 2005). This means that quality management uses quality assurance and control of processes as well as products to achieve more consistent quality. Quality management practices include all the means employed by managers in an effort to implement their quality policies. These activities include quality planning, quality control, quality assurance and quality improvement (Harris and McCaffer, 2001). This long term

development has made it imperative for all parties involved in construction projects to strive at all times to produce commendable structures. Mohammed (2006) was of the opinion that quality management is an effective system for integrating the quality development, quality maintenance and quality improvement efforts of various aspects of a system so as to enable services at most economical level and derive full satisfaction. In the works Easton & Jarrell (1998) used a proxy that establish the landmark of the quality management adoption by interviews with companies' representatives and found positive connections between adopting quality management and improvement in growth, profitability and market value. Timely completion of a construction project is frequently seen as a major criterion of project success by clients, contractors and consultants alike. Kahura, (2013) noted that there has been universal criticism of the failure of the construction industry to delivery of projects in a timely way. NEDO (2011) states that a disciplined management effort is needed to complete a construction project on time, and that this concerted management effort will help to control both costs and quality. Wong (1999) opined that construction companies are increasingly adopting quality management as an initiative to solve quality problems in the construction industry and to meet the needs of the client and end-user.

In recent times, organizations activities are becoming more project based, the implication is that organization tends to split routine work into programs of project in order to quickly achieve organizational goal of value added. According to Al-Tmeemy, Abdul-Rahman and Harun (2010) good management of these projects is essential if the organization is going to succeed. Equally important to individual project success is ensuring that the right projects are carried out. Directing all the projects successfully will ensure we are doing the right projects. Judges and Muller (2005) in their study found out that in order to define what success means in a project context is like gaining consensus from a group of people on the definition of "good art". Verma (2005) writes that communication, teamwork, and leadership are vital components of effective management of project human resources and are necessary to accomplish project objectives successfully. Similarly, a study conducted by Rategan (1992) indicated that a 90% improvement rate in employee relations, operating procedures, customer satisfaction, and financial performance is achieved due to quality management implementation.

Also the study carried out by Ahmed (2008) pointed out how construction professionals implement quality management and its tools in their projects in the different stages (design and construction). The results clearly showed that quality management has contributed immensely construction business by improving project quality, increase customer satisfaction, reduce cost, save

time and much more. According to Elonen & Yusuf (2003, cited in Caniels & Bakens 2011) inadequate balancing of scarce resources often results in additional pressure on the organization leading to poor quality of information and longer lead times of project. The quality of information been used to make decision among other things in a project can greatly affect the outcome of the project; if wrong/ inadequate information is generated it will lead to wrong decisions been made and consequently negatively affect the outcome of the project, (Kahura, 2013).

Research Methods

This study adopted survey research design to obtain information from top, middle and lower management staff of Julius Berger Nigeria Plc. The purpose of descriptive survey design, according to Ezeani (1998), is to collect detailed and factual information that describes an existing phenomenon. The target population of the study consist of the entire members of staff of Julius Berger Plc working at three different construction sites in Alimosho, Lagos Island and Badagry Local Government Areas all in Lagos state. Bases on the sample frame sighted, the entire population was approximately one hundred and thirty three (133). A sample size of one hundred (100) respondents was drawn from the population which was divided into three different strata using Yamane (1964) formula. The sample for the study consists of the top, middle and lower management staff of the company. These were strategically selected using stratified random sampling technique based on their levels. The various departmental structures of Julius Berger Nigeria Plc which includes engineering, plumbing, carpentry and welding were on ground at all the sites visited. 100 copies of questionnaire was administered to the respondents who were, at the time of this study, working at three different sites in Alimosho, Lagos Island and Badagry Local Government Areas all in Lagos state.

The questions were designed to deal with the subject; they were structured to source for more information from the respondents under investigation. The questionnaire was divided into two sections which comprises of the bio- data and questions that measure the effects of quality management on project success using a 5 likert scale, strongly agree, agree, undecided, disagree and strongly disagree. 52% of the administered questionnaires were returned fully filled by the respondents and used for the analysis of this study. The validity of the questionnaire was measured by content validity. In content validity, the emphasis is on adequate coverage by the instrument of the scope implied by the topic of study. The objectives of the research, the research questions and the conceptual framework are the focus in the design of the questionnaire. Comments and suggestions were collected from experts in the field to improve

the quality of the questionnaire. Test-re-test reliability method was employed to measure the reliability of the questionnaires administered to 25 respondents who completed the questionnaire two different times (February 2014 and April 2014). The Cronbach's alpha of the two measurements is 0.78 signifying that the research instrument is reliable. The data collected were analyzed using both descriptive and inferential statistics. The bio-data information generated in the course of the study was summarized through the use of frequency tables and percentages while the stated hypotheses were analysed using regression and correlation analyses with the aid of Statistical Package for Social Sciences (SPSS) software.

Table 1

Classes of Respondents Classified by Population, Proportion and Sample size.

CLASSES OF RESPONDENTS	POPULATION	PROPORTION	SAMPLE SIZE
<i>Top management</i>	21	16%	7
<i>Middle management</i>	52	39%	41
<i>Low level management</i>	59	44%	52
TOTAL	133	100%	100

Source: Field Survey (2014).

Sample size determination according to Yamane (1964),

$$n = \frac{N}{1 + N\alpha^2}$$

Where:

N = Entire population size

e = Error term (0.05)

n = Sample size

RESULTS

Table 2

Descriptive Statistics of respondents' demographic information

	Management level		
	Top	Middle	Low
Sex			
Male	5 (10%)	17 (33%)	20 (38%)
Female	2 (4%)	4 (8%)	4 (8%)
Age			
20-29	0 (0%)	5 (10%)	12 (23%)
30-39	2 (4%)	6 (12%)	11 (21%)
40-49	2 (4%)	1 (2%)	1 (2%)
50 and above	2 (4%)	0 (0%)	0 (0%)
Marital status			
Single	1 (2%)	8 (15%)	19 (37%)
Married	2 (4%)	7 (13%)	15 (29%)
Educational background			
Post graduate	1 (2%)	2 (4%)	0 (0%)
B.Sc / HND	1 (2%)	20 (38%)	4 (8%)
OND/NCE	0 (0%)	3 (6%)	15 (29%)
Others	0 (0%)	0 (0%)	6 (12%)
Department			
Engineering	3 (6%)	4 (8%)	12 (23%)
Plumbing	0 (0%)	2 (4%)	3 (6%)
Carpentry	0 (0%)	4 (8%)	8 (15%)
Welding	0 (0%)	6 (12%)	10 (19%)

Source: Field Survey (2014)

Table 2 showed that there were 42 (80.8%) males and 10 (19.2%) females; 27 (54%) of the respondents were of the age ranged 20-29, 27 (51.9%) were age ranged 30-39, 19 (36.5%) were of age ranged 40-49, 4 (7.7%) and above 50 years old, 2 (3.8%) The table also showed that 28 (53.8%) of the respondents were single, the married were 24 (46.2%). The educational background of the

respondents showed that 3 (5.8%) had Post graduate qualification, 25 (48.1%) had BSC (Bachelor of Science)/HND (Higher National Diploma) certificates, 18 (34.6 %) had OND (Ordinary National Diploma)/ NCE (National Certificate in Education) certificates, while 6 (11.5) had others, e.g MBA etc. The department of the respondents showed that Engineering accounted for 19 (37%), Plumbing were 5(10%), Carpentry were 12 (23%), while Welding accounted for 16 (31%).

Hypothesis One

Ho: Customer focus does not have an effect on timely delivery of project.

Table 3a

Model Summary of customer focus effect on timely delivery of project.

Model	R	R Square	Adjusted Square	Std. Error of the Estimate
1	.965	.932	.898	12.25692

Table 3a shows that customer focus has significant effect on timely delivery of project, $R^2 = 0.932$, $F(1, 2) =$, $p < 0.05$; this indicates that 93.2% of the success recorded in timely delivery of projects is attributed to customer focus.

Table 3b

Analysis of variance for customer focus effect on timely delivery of project.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4097.536	1	4097.536	27.275	.035
	Residual	300.464	2	150.232		
	Total	4398.000	3			

Table 3b shows that the effect of customer focus on timely delivery of project is statistically significant because the p-value (0.035) of the result is less than the level of significant used for the study (0.05). Also the calculated F-value (27.275) which is greater than the tabulated F-value (18.51) further shows that customer focus has significant effect on timely delivery of project. This means that time delivery of projects is achieved when a company is customer focused.

It can be concluded that customer focus has a positive effect on timely delivery of projects in Julius Berger Plc.

Hypothesis Two

Ho: There is no relationship between project quality and client satisfaction

		PQ	CS
PQ	Pearson Correlation	1	.866**
	Sig. (2-tailed)		.004
	N	4	4
CS	Pearson Correlation	.866**	1
	Sig. (2-tailed)	.004	
	N	4	4

** . Correlation is significant at the 0.05 level

The table above showed that there was a significant relationship between project quality and client satisfaction. ($P < 0.05$ level of significance). The value 0.866 in the model summary represents the correlation coefficient between project quality and client satisfaction. It shows that there is a positive relationship between project quality and client satisfaction. This implies that the quality of projects done by Julius Berger has enhanced client satisfaction.

Discussion of findings

In hypothesis one, the independent variable is customer focus while the dependent variable is time delivery of projects. The hypothesis was analysed using regression analysis. The variances of 0.932 successes recorded in time delivery of projects can be attributed to customer focus. This implies that customer focus has a positive effect on time delivery of projects. This was supported by Ahmed (2008) pointed out how construction professionals implement quality management and its tools in their projects in the different stages (design and construction). The results clearly showed that quality management has contributed immensely construction business by improving project quality, customer focus, increased client satisfaction; reduce cost, save time and much more. Timely completion of a construction project is frequently seen as a major criterion of project success by clients, contractors and consultants alike.

While, in hypothesis two the independent variable is project quality while the dependent client satisfaction. The hypothesis was analysed using Pearson correlation of coefficient. The value of 0.866 showed that there is a positive relationship between project quality and client satisfaction. This was supported by Oakland (2005) who stated that quality started with the understanding of customer needs and ended when those needs were satisfied. Generally speaking, customer needs identify the operational goals for firms to meet.

Conclusion and Recommendations

This study looked at the effects of quality management on project success. Current research on Quality Management concluded that quality is inherent aspect of every organization. From the findings it obvious that if quality management practices are well managed, there is a very high possibility of having a viable project that will guarantee a sound business success. It was recommended that;

To build a strong work force for project execution and to identify the needs of customers, project quality management must be used.

To successfully manage construction projects, the quality management teams are expected to closely examine and establish those factors that are critical to the success of their projects.

Measures should be taken by project managers and projects team leaders to ensure that project objectives are effectively communicated to team members as this will help go a long way determining its achievement.

The use of locally manufactured materials should be encouraged in the execution of construction projects provided that such materials are not sub – standard

Clients should be enlightened on the danger and effect of using low quality materials in the execution of construction projects as well as the implications of employing the services of incompetent professionals in the execution of project.

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