

Effects of Total Quality Management Practices on Performance of construction Projects in Trans Nzoia County

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Abstract

Quality is an important consideration in modern construction as evidenced by clients' increasing use of reputations of companies for quality work as a basis for choosing prospective contractors. TQMP and performance relationship is a popular discussion in the literature. Quality performance and TQM relationship is supported with various studies but the issue of project performance has not been thoroughly explored. Most scholars stress on the importance of TQMP on performance outcomes. The main aim of the study was to analyze the effects of TQMP on the Performance of Construction Projects. The specific objective of the study was to establish the effects of Leadership on the performance of Construction Projects. A descriptive survey research design was applied for this study. Census was conducted for data collection. A pilot study was done in Kakamega County where 20 questionnaires were distributed. The questionnaires were then evaluated for content validity and reliability. 110 questionnaires were then distributed to project professional in Trans Nzoia County according to the sample frame. The study received responses from 100 respondents of the targeted 110 respondents. Data analysis involved cleaning data and identifying common themes from the respondents' description of their experiences. Data collected was then coded, tested for completeness and analyzed. Frequency counts of the responses were obtained to generate information about the respondents and to illustrate the general trend of findings on the various variables that were under investigation. The multiple linear regression model indicated that 25.2% of performance of construction projects in Trans Nzoia County is influenced by total quality management practices. From the findings it can be concluded that leadership enhance the performance of construction projects in Trans Nzoia County. The study recommends that construction projects leadership should be incorporated in construction policies.

Keywords: *Total quality management, Leadership*

1.0 Introduction

The main philosophy behind TQM is satisfaction of customer needs. Zehir, Ertosun, Zehir and Muceldilli (2012) define TQM as a holistic quality improvement approach to firms for the purpose of improving performance in terms of higher quality products, more satisfied customers, reduced costs, improved financial, quality and innovation performance and improved employee satisfaction. The primary focus of TQM is the involvement of everyone and it has the ability to adapt to new ideas, tools and methods.

The most important determinant of success for an organization in implementing TQM is the ability of the organization to translate, integrate and institutionalize TQM practices on the job. TQM is a way of thinking about goals, organizations, processes and people to ensure things are done right the first time (Pheng & Teo, 2004). The PMI defines a Project as a temporary endeavor that has a defined beginning and end time. A project is also unique with a set of operations that are not routine but with specific set of operations that are designed to accomplish certain goals. A construction project is considered as successful if it meets certain performance measures such as timely completion, within budget as well as satisfying stakeholder's needs in the project. Also

the absence of reworks as well as ‘fitness of purpose’ for the end users are also indicators of project success (Kihoro, 2015). Nassar (2009) proposed a methodology that quantifies separately the performance of the major objectives of the project in order to measure the overall performance. The major project objectives included cost, schedule, cash flow, profitability, quality, project team satisfaction and client satisfaction. The role of the construction sector is very significant because of its productivity and accomplishment of socio-economic objectives like shelter, infrastructure and employment opportunities (Usman et al., 2012).

Proper implementation of TQM in construction industry provides numerous benefits such as customer satisfaction, improvement of employee quality awareness and consciousness, reduced quality costs, decrease of wastage, project completion on time, improved organizational performance and closer relationships with sub-contractors and suppliers and competitive advantage (Love, Edwards & Sohal, 2004). A number of studies have indicated a positive relationship between performance outcomes and TQM. Projogo and Sohal (2003), in their study of the relationship between TQM practices, quality performance and innovation performance, underscore the importance of TQM on quality performance. TQM involves activities such as leadership, training, employee relations, quality data and reporting, supplier quality management, product service design, process management, strategic planning, customer focus, information technology and analysis and people management.

Several approaches to improve company performance have been presented by Quality authorities such as Edward Deming (1950’s); Joseph Juran (1950’s) and Philip Crosby (1980’s). These approaches are part of a set of quality management practices known as TQM. During the past decades, a number of management alternatives for quality have been developed and practiced in the construction industry. New management approaches for construction projects have mostly been concerned with liabilities and contractual claims between parties and few have entered into developing systems that enhance open communications and total involvement of the participants in a project. The word “quality” has been derived from the Latin word *qualis*, meaning, “what kind of”. Quality is a difficult and elusive term to define as it has a wide variety of meanings and connotations attached to it hence its referred to as a “slippery concept” (Sahney, Banwet & Karunes, 2004). It is slippery because it has a wide variety of meanings implying different things to different people. Thus, it has been defined with different perspectives and orientations, according to the person, the measures applied and the context within which it is considered. There seems to be no consensus on the definition, but they all deal either with the product or the services producing these products/services. From the perspective of the consumers or users, a product or service-based definition is more useful. From the perspective of the organization providing goods/services, the process-perspective is more useful (Sahney et al., 2004).

The KPMG 2015 Global Construction Survey found out that in the year 2014, 60% of organizations that spent USD 10m or more on construction projects had at least one that failed. The common reasons construction projects fail include underestimating the project, Scope creep, delays, surprise conditions, unclear specifications, financing issues, unreliable workers, Communication gaps and improper planning. This show that construction projects are facing challenges in terms of project performance. Several studies have been conducted to examine factors impacting on project performance in developing countries. Hanson (2008) studied the causes of client dissatisfaction in the South African building industry and found that conflict, poor workmanship and incompetence of contractors to be among the factors which negatively impact on project performance.

The performance of contractors in Zambia is below expectation; it is not uncommon to learn of local projects that have not been completed or significantly delayed. This poor performance of many contractors has huge implications in terms of their competitiveness (Zulu & Chileshe 2008). Anaman and Amponsah (2007), in their study of Analysis of the causality links between the growth of the construction industry and the growth of the macroeconomy in Ghana, state that, “A vibrant construction industry in a developing country, that mobilizes human and local material resources in the development and maintenance of buildings, housing and physical infrastructure, is an important means to promote increased local employment and accelerate economic growth”. They further note that the construction industry is often seen as a driver of economic growth in developing countries. Kheni and Ackon (2015) carried out a study in Ghana on the impact of total quality management practices on construction project quality performance and state that effective quality management of construction processes and products is an important consideration in modern construction as evidenced from clients’ increasing use of companies’ reputations for good quality work as a basis for selecting prospective Contractors. There is therefore a need for the construction industry in developing countries to implement total quality management due to global competition. They further note that even though TQM has had numerous benefits in developed countries, it is yet to be confirmed that the same benefits shall be derived with the implementation of TQM in construction projects in developing countries. The findings of this study indicated that TQM practices are positively related to construction project quality performance.

In Kenya, the Construction industry is an important sector as it is supposed to facilitate the development of infrastructure which is a central pillar of Kenya's development masterplan, Vision 2030. Over the past few years the government has done a number of projects in the roads and housing sectors. The Kenyan construction industry is set to grow for the next decade as indicated by BMI Research, a company that analyses construction industry trends, in a study carried out in 2017. The study showed that the industry will grow by 8.7% in 2017 and remain steady up to 2026 with an annual growth of 6.6 %. The BMI supports its finding with the government's huge spending on infrastructure development such as the Standard Gauge Railway and the LAPPSET Corridor. According to the KNBS, the real estate and construction sectors continue to be key drivers of economic growth in Kenya and the Kenyan construction industry contributes 7% of the GDP. There however still exist extensive opportunities for investment in areas of slum upgrading and informal settlements and construction of middle and low income housing. The Economic Survey 2016 published by the KNBS reported that approximately 148,000 people are formally employed in the domestic building and construction industry. The Construction industry continues to grow rapidly due to a huge deficit in infrastructure and rapid population growth increasing demand for business premises, office space and residential places.

According to Cision PR Newswire, currently 11 of the 43 major infrastructure projects in East Africa are in Kenya. These mega projects include the USD 2.1bn Tatu City Project, the USD 1bn Lamu Port Berths Project and the USD 900m Lake Turkana Wind Power Project among others. These statistics underscore the importance of the construction industry in Kenya. Despite the importance in terms of economic and social value of reliable and efficient infrastructure, many projects in Kenya continue to experience delays in timely completion. Nyika (2012) found out that 20.8 per cent of the projects in Kenya were implemented on time and budget and 79.2 per cent exhibited some form of failure. According to this study, the major causes of failures are insufficient implementing capacity, poor project management, weak project design and political interference. To be able to sustainably implement infrastructure projects, it is necessary that the construction industry builds sufficient capacity to undertake the projects to ensure timely, quality and cost effective implementation of these development projects. There is therefore the need to investigate if TQM practices will be able to improve the performance of construction projects.

Magutu et al. (2010) point out that TQM presents a strategic option and an integrated management philosophy for organizations which enables them to attain their objectives effectively and efficiently and to achieve sustainable competitive advantage. Magutu et al. (2010) further elaborate that from a managerial philosophy viewpoint, the elements of TQM are varied. Different terms like total quality improvement, total quality leadership and strategic quality management are actually examples showing the different emphasis placed on particular aspects of what is generally called total quality management. Wamweya (2013) also carried out a study of total quality management in the lift industry and found that total quality management has a positive effect on performance. The Construction industry is an important sector in Kenya as it is supposed to facilitate the development of infrastructure which is a central pillar of Vision 2030. The importance of this sector is emphasized by the huge expenditure by the government and the private sector on infrastructure projects, the high contribution of this sector to the GDP and the large number of people employed in this sector. Nyika (2012) found out that 20.8% of the projects in Kenya were implemented on time and budget and 79.2% exhibited some form of failure. From this study it can be seen that the number of projects that have been successfully implemented are less than the number of projects that have been unsuccessfully implemented. The failures were attributed to insufficient implementing capacity, poor project management, weak project design and political interference. Since the construction industry in the country continues to grow rapidly due to a huge deficit in infrastructure and rapid population growth increasing demand for business premises, office space and residential places, these statistics are expected to get worse if mitigation measures are not put in place.

Though extensive research on TQM and its impact on project performance has been done elsewhere (Kheni & Ackon, 2015; Zu, 2009; Jaafreh & Al-abadallat, 2012; Saeed & Hasan, 2012; Gonzalez, Jimenez & Lorente, 2013; Prajogo & Sohal, 2003), there is no similar research in Kenya, aimed at examining the effect of total quality management practices on the performance of construction projects. TQM has brought around higher quality products, more satisfied customers, reduced costs, improved financial, quality and innovation performance, however, there has been complaints of lack of communication between management and Employees, intimidation of Employees by the management, non-support of employees' ideas, indecision of the top management, management's unfairness to employees, keeping improper records and lack of knowledge transfer due to poor Knowledge management, obsolescence, inefficiency and incompetence of employees due to lack of training, dissatisfaction of customers, poor customer management, injustice and unfairness to customers. This study therefore sought to examine the effects of total quality management practices on the performance of construction projects in Kenya. The specific objective was to establish the effect of Leadership on performance of construction projects in Trans Nzoia County.

2.0 Effect of Leadership on performance of construction projects in Trans Nzoia County.

Dubrin (2016) defines leadership as the ability to inspire confidence and support among those required to achieve organizational goal. Omachonu and Ross (2004) summarize the characteristics of excellent leadership as being visible, committed and knowledgeable, having missionary zeal, having aggressive targets, being a strong driver, communicating values, being organized and having customer contact. Juran and Gryna (1993) identified the roles of top management as: Establishment of quality policies, establishment and deployment of quality goals, provision of resources, provision of problem-oriented training and improvement. According to Sadikoglu and Olcay (2014), Leaders in a TQM system view the firm as a system, support development of employees, establish multipoint communication among managers, employees and customers and make efficient and effective use of information. Leaders also encourage participation of employees in decision-making and they empower them. Commitment of top management and participation in TQM practices are the most important factors for success of TQM practices. Managers have to demonstrate more leadership than traditional management so as to increase employees' awareness of quality activities in TQM adoption and implementation.

According to Kaynak (2003), management leadership is a key factor in TQM implementation as it improves performance by influencing other TQM practices. For successful implementation of TQM, effective change in an organization's culture is required. However, it is impossible to change an organization without a concentrated management effort aimed at open communication, continuous improvement and cooperation throughout the value chain. He further argues that since it is impossible to improve any organization's operations without a well-trained workforce, management has to provide the resources necessary for training employees in the use of new principles and tools and create a work environment conducive to employee involvement in the process of change. Adebajo and Kehoe (1999) state that since it takes more than training to guarantee efficient and successful change, the leadership must involve Employees in the process of change by creating a work environment that encourages and facilitates open communication.

Effective leadership is also critical in improving interactions with supply chain members (Cooper & Ellram, 1993). Management can promote mutually beneficial relations with suppliers by putting quality and delivery performance over price in the selection of suppliers and certifying suppliers for material quality (Flynn, Schroeder & Sakakibara, 1995; Trent & Monczka, 1999). Strategic management of supplier relationships is essential to the success of organization-supplier relationships since these partnerships require both a high level of commitment and an exchange of competitive information (Ellram, 1991). Kaynak (2003) underscores the importance of leadership in focusing product design in market and consumer needs. This is crucial in developing products that meet customer needs. There is a strong empirical support for the effects of top management on traditional TQM practices such as supplier relationships, workforce management and customer relationships.

Oberlander (2000) states that the prominent method of management practiced today is management by control and not by participation. The top management may set goals to be achieved for the next year and then assign the responsibility of achieving these goals to the subordinates by imposing controls on each of their subordinates. He further states that in construction, schedule, costs and quality goals are established for each project. Project managers in design and construction are rewarded on the basis of attaining these goals. However, problems arise when the work gets displaced by the controls themselves. If the measurable controls are impractical or unattainable, individuals and groups tend to fabricate conformance. In other cases, contradictions may arise between controls of different departments which can lead to accusations and poor relations. Management through control encourages an organization to look at its own structures rather than the world in which the customer operates. Once management appreciates the presence of negative aspects in its current style of management, it can begin to comprehend how TQM can benefit the company. After management accepts existence of a problem, the next step for management is to develop a clear understanding of the underlying principles and elements that constitute TQM. Management can then demonstrate, through action, their commitment to quality. Previous studies have found that leadership improves overall firm performance (Macinati, 2008; Powel, 1995 and Zu, Fredendall & Douglas, 2008).

3.0 Method

According to Sekran and Bougie (2016), a research design is a blueprint or plan for the collection, measurement and analysis of data, created to answer the research question. The study employed a descriptive survey research design. The target population was 110 professionals in construction projects in Trans Nzoia County. This study carried out a census for the collection of data where 110 professionals in 20 construction projects in Trans Nzoia County were interrogated. A Structured questionnaires were used to collect the required information from the study population. The questionnaires had questions regarding variables of the study and the Likert scale

was used with respondents answering the questions in each variable based on a strength of 1 to 5 where 1 is “Strongly Agree”, 2 is “Agree”, 3 is “Neutral”, 4 is “Disagree”, and 5 is “Strongly Disagree”. Pilot test was done to test the validity and reliability of the research instrument. Multiple regression analysis technique was used to determine the effect of independent variables on the dependent variable.

4.0 Results

The study sought to establish the effect of Leadership on performance of construction projects in Trans Nzoia County. The findings on whether the project’s senior staff accept the responsibility for quality and has proper and effective leadership. The distribution of findings showed that 7.0% of the respondents strongly agreed, 48.0% of them agreed, 28.0% of the were neutral, 11.0% disagreed while 6.0% of them strongly disagreed. These findings imply that the project’s senior staff accept the responsibility for quality and has proper and effective leadership.

The respondents were also asked whether the project’s senior staff are always prompt in making decisions or responding to issues. The distribution of the responses indicated that 3.0% strongly agreed to the statement, 31.0% of them agreed, 33.0% of them were neutral, 23.0% of them disagreed while 10.0% of them strongly disagreed to the statement. These findings imply that the project’s senior staff are always prompt in making decisions or responding to issues.

The respondents were also asked whether the project’s senior staff offers strategies to sustain the project. The distribution of the responses indicated that 7.0% strongly agreed to the statement, 47.0% of them agreed, 29.0% of them were neutral, 6.0% of them disagreed while 11.0% of them strongly disagreed to the statement. These findings imply that the project’s senior staff offers strategies to sustain the project.

The respondents were further asked whether the project’s senior staff has objectives for quality performance. The distribution of the responses indicated that 7.0% strongly agreed to the statement, 24.0% of them agreed, 40.0% of them were neutral while 17.0% and 12.0% of them disagreed and strongly disagreed to the statement respectively. These findings imply that the project’s senior staff has objectives for quality performance.

The respondents were further asked whether the project’s senior staff evaluates quality performance. The distribution of the responses indicated that 14.0% strongly agreed to the statement, 18.0% of them agreed, 40.0% of them were neutral, 23.0% of them disagreed while 5.0% of them strongly disagreed to the statement respectively. These findings imply that the project’s senior staff evaluates quality performance.

The respondents were asked whether the project’s senior staff encourages accountability. The distribution of the responses indicated that 19.0% strongly agreed to the statement, 46.0% of them agreed, 18.0% of them were neutral, another 17.0% of them disagreed while none of them strongly disagreed to the statement respectively. These findings imply that the project’s senior staff encourages accountability.

The respondents were further asked whether the project’s senior staff emphasises on customer satisfaction. The distribution of the responses indicated that 7.0% strongly agreed to the statement, 43.0% of them agreed, 27.0% of them were neutral, 12.0% of them disagreed while 11.0% of them strongly disagreed to the statement respectively. These findings implied that the project’s senior staff emphasises on customer satisfaction.

Finally, the respondents were asked whether good leadership enhances project performance. The distribution of the responses indicated that 36.0% strongly agreed to the statement, 37.0% of them agreed, 16.0% of them were neutral and 11.0% of them disagreed while none of them strongly disagreed to the statement. These findings imply that good leadership enhances project performance. The findings are shown in table 4.1 below.

Table 4.1: Leadership

Statements		SA	A	N	D	SD	T
The project's senior staff accept the responsibility for quality and has proper and effective leadership	%	7.0	48.0	28.0	11.0	6.0	100.0
The project's senior staff are always prompt in making decisions or responding to issues	%	3.0	31.0	33.0	23.0	10.0	100.0
The project's senior staff offers strategies to sustain the project	%	7.0	47.0	29.0	6.0	11.0	100.0
The project's senior staff has objectives for quality performance	%	7.0	24.0	40.0	17.0	12.0	100.0
The project's senior staff evaluates quality performance	%	14.0	18.0	40.0	23.0	5.0	100.0
The project's senior staff encourages accountability	%	19.0	46.0	18.0	17.0	0.0	100.0
The project's senior staff emphasises on customer satisfaction	%	7.0	43.0	27.0	12.0	11.0	100.0
Good leadership enhances project performance	%	36.0	37.0	16.0	11.0	0.0	100.0

4.1 Inferential Statistics

4.1.1 Pearson Correlation

The study sought to establish the strength of the relationship between independent and dependent variables of the study. Pearson correlation coefficient was computed at 95 percent confidence interval (error margin of 0.05). Table 4.10 below illustrates the findings of the study.

Table 4.2: Correlation Matrix

		Project Performance
	Pearson Correlation	.533**
Leadership	Sig. (2-tailed)	.000
	N	100

** . Correlation is significant at the 0.05 level (2-tailed).

The p-value for leadership was found to be 0.000 which is less than the significant level of 0.05, ($p < 0.05$). The result indicated a Pearson Correlation coefficient (r-value) of 0.533, which represents an average, positive relationship between leadership and performance of construction projects in Trans Nzoia County.

4.1.2 Multiple Linear Regression

Multiple linear regressions were computed at 95 percent confidence interval (0.05 margin error) to show the multiple linear relationship between the independent and dependent variables of the study.

4.1.3 Coefficient of Determination (R²)

Table 4.3 below shows that the coefficient of correlation (R) is positive 0.529. This means that there is a positive correlation between total quality management practices and performance of construction projects in Trans Nzoia County. The coefficient of determination (R Squared) indicates that 27.9% of performance of construction projects in TransNzoia County is influenced by total quality management practices. The adjusted R² however, indicates that 25.2% of performance of construction projects in TransNzoia County is influenced by total quality management practices leaving 74.8% to be influenced by other factors that were not captured in this study.

Table 4.3: Model Summary

Model	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
1	.529 ^a	.279	.252	4.10718

a. Predictors: (Constant), leadership, knowledge management, training and customer focus

4.1.4 Analysis of Variance

Table 4.4 below shows the Analysis of Variance (ANOVA). The p-value is 0.000 which is < 0.05 indicates that the model is statistically significant in predicting how total quality management practices affects performance of construction projects in Trans Nzoia County. The F – test was 34.211. The results also indicate that the independent variables are predictors of the dependent variable.

Table 4.4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	786.755	4	174.691	34.211	.000 ^b
1	Residual	1681.234	113	18.869		
	Total	2345.000	109			

4.1.5 Regression Coefficients

From Table 4.5, the regression model can be derived as follows:

$$Y = 33.755 + 0.511X_1$$

The results in table 4.5 below indicates that all the independent variables have a significant positive effect on project performance. leadership with a coefficient of 0.511 (p-value = 0.000). According to this model when all the independent variable values is zero, project performance of will have a score of 33.755.

Table 4.5: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	33.755	2.638		11.279	.000
1 Leadership	.511	.127	.697	3.985	.000

4.5 Hypothesis Testing

Ho₁: Leadership does not have a significant effect on performance of construction projects in Trans Nzoia County.

From Table 4.5, leadership ($\beta = 0.511$) was found to be positively related to performance of construction projects in Trans Nzoia County. From t-test analysis, the t -value was found to be 3.985 and the ρ -value 0.000. Statistically, this null hypothesis was rejected because $\rho < 0.05$. Thus, the study accepts the alternative hypothesis and it concludes that leadership has a significant effect on performance of construction projects in Trans Nzoia County.

5.0 Conclusion and Recommendation

The study sought to establish the effect of Leadership on performance of construction projects in Trans Nzoia County. The findings imply that the project's senior staff: accept the responsibility for quality and has proper and effective leadership, are always prompt in making decisions or responding to issues, offers strategies to sustain the project, has objectives for quality performance, evaluate quality performance, encourages accountability and emphasises on customer satisfaction. The findings also imply that leadership has a significant effect on performance of construction projects in Trans Nzoia County thus .enhances project performance.

Basing on the research findings on the effects of total quality management practices on the performance of construction projects, the recommended that the management of construction projects should have a thorough review of their construction policies to incorporate leadership aspects that would enhance performance of the employees and delivery of the project within cost and time.

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