

Project Cost Management and Performance of Urban Road Projects in Kenya

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Abstract

The construction industry has complexity in its nature because it contains a large number of parties such as clients, contractors, consultants, stakeholders, shareholders, and regulators. The urban road projects have been experiencing poor performance in form of delays in completion, high cost, and low quality. This paper sought to determine the relationship between project cost management and the performance of urban road projects in Kenya. The study adopted descriptive survey research, while the target population was 408 construction registered professionals within Kenya urban roads authority projects. A sample size of 202 was used. Primary data was collected through the administration of questionnaires. Findings revealed that project cost management had a positive and statistically significant influence on the performance of urban road projects in Kenya. The study concluded that project cost management significantly contributes to the enhanced performance of urban road projects in Kenya. The study recommended that construction firms' management needs to strengthen project cost management. In particular, the management should focus on enhancing the following project cost management aspects: resource acquisition, cost estimation, cost budgeting, and cost control.

Keywords: *Project cost management, Performance, Urban road projects*

1.0 Introduction

Wongrassamee et al. (2013) contend that different kinds of people measure project performance in different ways at different times. Zulu and Chileshe (2008) explain that achieving the satisfaction of the main project stakeholders including the customer is one of the fundamental goals of project performance. Project stakeholders are satisfied when the project is completed in good time and quality criteria are met. This minimizes cost overruns and hence saves the cost of the project. The commonly utilized tool for measuring performance is referred to as the Balanced Score Card (BSC) while the indicators include; Key Performance Indicators.

Project Cost Management is a professional capability and expertise in planning and controlling costs for a construction project as well as analyzing the potential risks that potentially lead to swelling of construction costs. According to Young and Lbbs (2002), cost management is a process of controlling expenses on construction projects in every stage from feasibility to handover, and ensuring that the cost plan is still in place. According to Thamhain (2014) Managers might feel pressured to provide optimistic time or cost estimates to influence project

approval. However, inaccurate cost estimates will eventually lead to unrealistic project plans that cannot be executed within the established constraints. They are running the risk of feasibility reassessment, re-planning, or, worse, cancellation with dire consequences to all parties involved.

Globally, research carried out in the USA showed that in the current economic landscape, project owners are scaling down or eliminating capital construction projects due to lack of financing, uncertainty over costs, poor management, and concerns about potential delays that could impact the feasibility basis of the project (Chism & Armstrong, 2010). Lu Shan (2014) stated that Chinese construction firms employed proper planning and control techniques, proper coordination between designers and contractors, and technical and professional expertise which enabled the firms to complete their projects within the schedule and budgeted cost. Management commitment, sufficient information and communication channels, and competent staff were also significant in the delivery of successful infrastructure projects (Boddy, 2009).

Africa Countries are improving the management of their road networks, introducing private sector finance, setting up new style road funds, and changing the way they set spending priorities and manage their roads (IRF, 2018). Road transport is the dominant mode in Africa, and it has been recognized internationally that roads deserve more attention (IRF, 2018). Harries and Reyman (2010) noted that on average 65 percent of road projects constructed by local firms in Africa were considered to have failed. These projects were suspended and later contracted to other firms. Therefore, the performance of projects is a subject many scholars have discussed to ensure that projects are undertaken within the stipulated cost, and schedule and meet the desired quality.

Under Vision 2030, the Kenyan government aspires for a country firmly interconnected through a network of roads and other infrastructural facilities. It further proposes the intensified application of science, technology, and innovation to raise productivity and efficiency in the road infrastructure sector. The government indicated that investment in the nation's road infrastructure will be given the highest priority. Through Vision 2030, annual infrastructure investment requirements for road and other infrastructural facilities are likely to average around 3.5 percent of world gross domestic product (OECD, 2012). Infrastructure sector financial requirements in Kenya were estimated at KES 486 billion in 2014/15 (AfDB, 2013).

Problem Statement

A government report from the Ministry of Roads & Public Works (GoK, 2016) identified eight main reasons for the failure of government projects: inadequate planning; insufficient buy-in by senior management; failure to engage effectively with key stakeholders; a lack of technical skills; poor project monitoring and review; inadequate initial evaluation of the project; poor networking skills; and failure to integrate the disparate parties needed to deliver project success. About 14.4% of classified roads (9,100 km) and 2.2% (2,500 km) of unclassified roads are paved road networks while the rest are either gravel or earth surface. It is estimated that about 18 % of the classified road network is in good condition, 27 % in fair condition, 49% in poor condition, and 6 % in very poor condition. Currently, most of the repair and reconstruction is ongoing with about 55% of the roads still in poor condition (Mailu, 2015).

Kenya has had tremendous growth in traffic of 8.2% annually while experiencing traffic growth of 8.2% a year, population growth of 4.1% a year, and economic growth of 6% a year; has not been matched with the development of the road network resulting into persistent traffic jams

and conflict of different modes of transport costing the economy about 0.9% of the GNP annually (World Bank, 2013). In a study by the World Bank (2013) in Kenya, counties have for about 3 years now carried out various projects successful with counties like Machakos, Meru, and Kericho reporting up to 12% pa positive projects implementation, but a number of the 47 counties have failed on the way due to prevailing project planning practices among other factors like wrong prioritization of development projects, lack of financial resources, political influence, corruption, low levels of technology, poor infrastructure, lack of community involvement, poor management support and many more.

Idoko (2018) noted many road projects in Kenya encounter considerable time and cost overruns fail to realize their intended benefit or are even totally terminated and abandoned before or after their completion. World Bank (2010) shows project planning as having the most significant impact on achieving project success which is equated to achieving project objectives. Cooke-Davies (2010) consistently shows that well-trained teams deliver more benefit to project management than undertrained teams because they reduce risks to projects by carefully selecting the most appropriate technologies, hiring the most affordable and experienced consultants, and using sophisticated planning practices to ensure functional success. Hence this study sought to examine the relationship between project cost management and the performance of Kenya urban roads authority projects to address the knowledge gaps left by previous scholars.

2.0 Literature Review

The resource-based theory was first authored by Wernerfelt (1984) and later reviewed by other contributors who expounded on the influence that both tangible and intangible assets have on the performance of an organization (Crook *et al.*, 2008). The resource-based view theory magnifies the importance of internal resources within the firm and the use of these resources in formulating a strategy to achieve sustainable advantage within the firm's competitive markets (Schroeder *et al.*, 2002). According to the RBV, a firm's internal capabilities determine the strategic choice it makes in competing in its external environment.

This is in line with the influence that project planning practices have on the performance of a firm. Closer to the context of the construction industry, the RBV is used to identify and explore manpower expertise and project planning systems that can help construction firms manage present construction projects and grab future business opportunities, therefore, increasing the firm's portfolio. Capabilities, resources, and knowledge acquired over time create options for future business exploration and give the firm leverage over its competitors (Kogut & Kulatilaka, 2001). Within the context of the construction industry, these may include, plant and machinery, planning and schedule templates, cost and financing models, professional consultants and knowledge workers as well as certified organizational processes and best practices.

Loasby (2002) explores the view that investments in resources and capabilities are choice decisions made in the context of uncertainty and that it is the combination of these factors that make real options potentially valuable. Resources are inputs into a firm's production process, such as capital, equipment, skills of individual employees, patents, finance, and talented managers. Resources are either tangible or intangible. With increasing effectiveness, the set of resources available to the firm tends to become larger. Individual resources may not yield a competitive advantage.

Project cost management is a professional capability and expertise in planning and controlling costs for a construction project as well as analyzing the potential risks that potentially lead to

swelling of construction costs. According to Young and Lbbs (2002), cost management is a process of controlling expenses on construction projects in every stage from feasibility to handover, and ensuring that the cost plan is still in place. According to Thamhain (2014) Managers might feel pressured to provide optimistic time or cost estimates to influence project approval. However, inaccurate cost estimates will eventually lead to unrealistic project plans that cannot be executed within the established constraints. They are running the risk of feasibility reassessment, re-planning, or, worse, cancellation with dire consequences to all parties involved.

According to PMBOK (2013), it is one of the three activities that need to be performed as part of the cost management function. Despite the sophistication and variety of approaches and computer support cost estimating is still an art, at least to some degree. Regardless of the level of estimating detail chosen, the process cannot be performed without a clear project definition at the level of the required estimate and a selection of the estimating method (Olawale & Sun, 2010).

3.0 Methodology

The study adopted descriptive survey research while its target population was 408 construction registered professionals within Kenya urban roads authority projects. A sample size of 202 was used. Data collection procedures were started by obtaining permission from relevant authorities. Primary data was collected through the administration of questionnaires to the relevant construction professionals in the Kenya urban roads authority. In this study, qualitative data was analyzed using content analysis, and quantitative data was analyzed using descriptive and inferential statistics.

4.0 Results and Discussion

This section provides descriptive and regression analysis results.

Descriptive statistics of project cost management

As indicated in Table 1, the respondents strongly agreed that the modeling of exact materials enables the exact estimation of material costs as indicated by 4.5. Respondents further agreed that the project planning platform offers better project cost management tools than the traditional methods; that project planning generates more accurate cost management within a much shorter period than the traditional methods; that cost management that is planned tends to be more reliable; that carrying out a value engineering exercise is easier and faster on the project cost management platform and that cost management from project planning are easy to interpret and understand thus enabling faster decision making as indicated using 3.8,3.9,4.3,4.4 and 4.1 respectively.

Table 1: Statements regarding project cost management

Statements on project cost management	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agreed	Mean
The project planning platform offers better project cost management tools than the traditional methods	2.4%	6.1%	22.0%	44.5%	25.0%	3.8
Project planning generates more accurate cost management within a much shorter period than the traditional methods	1.8%	2.4%	20.7%	49.5%	25.6%	3.9

Cost management which are planned tend to be more reliable and dependable	0.6%	3.7%	12.8%	33.5%	49.4%	4.3
Carrying out a value engineering exercise is easier and faster on the project cost management platform	1.8%	2.4%	12.8%	51.3%	31.7%	4.4
The modelling of exact materials enables the exact estimation of material costs	0.6%	4.9%	11.6%	40.9%	42.1%	4.5
Cost management from project planning is easy to interpret and understand thus enabling faster decision making	1.8%	2.4%	12.8%	51.3%	31.7%	4.1

The study sought to find out respondents’ opinions on whether cost management can help in improving the quality of road projects. From the findings in Figure 1, a majority (70%) of the respondents indicated that cost management can help in improving the quality of road projects while 30% of the respondents indicated that cost management cannot help in improving the quality of road projects.

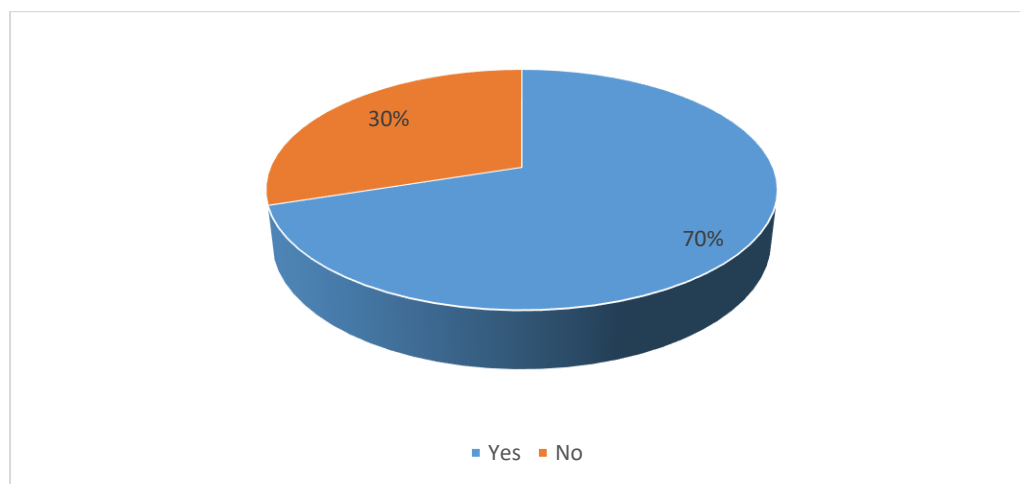


Figure 1: Whether cost management can help in improving the quality of road projects

Descriptive statistics on Performance of Urban Road Projects

The study sought to find out the level of agreement with the statements Performance of Urban Road Projects in Kenya. From the findings in Table 2, the respondents agreed that the breakdown of many of the urban road projects is due to the breakdown in the industry; that performance is associated with several factors such as time, cost, quality, client satisfaction, productivity, and safety; that Other grounds affecting projects performance are poor management and guidance; inapt participants; poor relations and coordination, and that lack of motivation, insufficient infrastructure, political problems, cultural problems and economic conditions as indicated by 3.7,4.0,4.5,4.0,4.3 and 4.6 respectively.

Table 2: Statements on performance of Urban Road Projects

Statements on performance of road projects	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agreed	Mean
The breakdown of many of the urban road projects is due to the breakdown in the industry.	2.4%	5.5%	31.7%	36.6%	23.8%	3.7

Performance is associated with several factors such as time, cost, quality, client satisfaction, productivity, and safety.	0.6%	3.0%	21.3%	35.5%	39.6%	4.0
Other grounds affecting project performance are poor.	1.8%	1.2%	7.9%	41.5%	47.6%	4.5
management and guidance; inapt participants; poor relations and coordination; lack of motivation,	1.8%	14.6%	14.0%	34.8%	34.8%	4.0
insufficient infrastructure, political problems, cultural Problems and economic	0.6%	1.8%	9.8%	48.2%	39.6%	4.3
conditions	3.7%	2.4%	15.2%	32.9%	45.8%	4.6

Relationship between cost management and performance of urban road projects

The study sought to determine the relationship between project cost management on performance of urban road projects in Kenya. A simple linear regression was performed to examine the link between the two variables. Table 3 presents R and R square values for coefficient of correlation and extent of variation respectively. The R-value of 0.730 indicates a strong positive correlation between cost management and the performance of urban road projects. The R-square value of 0.533 indicates that 53.3% of changes in performance of urban road projects are contributed by cost management. The remaining 46.7% of the performance of urban road project variation can be explained by other factors not captured in this model.

Table 3: Model summary; cost management and performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730 ^a	.533	.530	4.6296

a Predictors: (Constant), cost management

Table 4 indicates the ANOVA model results. The F statistic value was 213.367 and the p value of 0.000 was less than 0.05. This implied that the regression model predicts significantly the dependent variable (performance of road projects). This suggested that cost management was a significant predictor of the performance of road projects.

Table 4: ANOVA; cost management and performance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4573.172	1	4573.172	213.367	.000 ^b
	Residual	4008.045	187	21.433		
	Total	8581.217	188			

a Dependent Variable: Project performance

b Predictors: (Constant), cost management

As indicated in Table 5, statistical coefficients of cost management and the performance of road projects showed that the value of the unstandardized coefficient (B) was 0.883 ($p < 0.05$), which implied that cost management significantly and positively predicts performance of road projects

The linear regression model equation is presented as follows;

$$Y = 4.536 + 0.883X$$

Where;

Y = Performance of road projects

X = Cost management

From the above equation, the model predicts that when project cost management is zero, the performance of road projects is 4.536. It also predicts that for a one-unit increase in cost management, the performance of road projects increases by 0.882 units holding the other predictors fixed.

The study findings supported Chen (2007) argument that for a project to be successful there should be adequate funds allocated to finance its completion. Jackson (2010) also added that project funds availability is an important factor that influences the delivery of a project. Further, Sambasivan and Soon (2007) mentioned that failure to achieve targeted time, budgeted cost, and specified quality result in various unexpected negative effects on the projects.

Table 5: Regression coefficients; scope management and performance

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	4.536	.948		4.783	.000
Cost management	.882	.060	.730	14.607	.000

a Dependent Variable: Performance

5.0 Conclusion

The study concludes that modeling of exact materials enables the exact estimation of material costs and that the project planning platform offers better project cost management tools than the traditional methods. Project planning generates more accurate cost management within a much shorter period than the traditional methods and the cost management which are planned tends to be more reliable. In particular, the study concludes that project cost management positively and significantly contributes to enhanced performance of urban road projects in Kenya.

6.0 Recommendations

The study established that project cost management had a positive and significant influence on the performance of urban road projects in Kenya. The study recommended that construction firms' management needs to strengthen project cost management. In particular, the management should focus on enhancing the following project cost management aspects: resource acquisition, cost estimation, cost budgeting, and cost control.

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