Role of Project Management Planning on Project Success in Kenya: A Case of Kenya Power Infrastructure Development Projects

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Abstract: This research adopted a descriptive study to obtain information about the role of project management planning on project success in Kenya. The target population of the study was all the 177 project managers managing all the 177 Kenya Power Infrastructure Development Projects approved in the financial year 2016/2017. The study adopted a census survey to collect data from all the project managers. Structured questionnaires were used to collect data. Quantitative data analysis included descriptive and inferential statistics used to analyze the data collected. Qualitative data was analyzed through content analysis and presented in continuous prose form. The study was governed by four theories; Project Management theory, the Logical Framework Model, Goal-Setting Theory of Motivation and competence theory. The role of project management planning functions: Scope Planning, Cost Planning, Time Planning and Quality Planning on the success of Kenya Power Infrastructure Development Projects were deduced from the results of the study.

Keywords: Construction, Core Competencies, Cost baseline, Cost Planning, Project management, Project Performance, Project Scope, Quality planning, Scope planning, Stakeholders, Time Planning.

I. INTRODUCTION

The construction industry is a key industry in the economy of any country worldwide. It is one of the biggest industries in the world contributing to around 10% of the global Gross Domestic Product (GDP). Ngacho and Das (2014) observed that development projects play a key role in the growth of economies in developing countries in terms of contributing towards the Gross Domestic Product (GDP), employment generation and a market for materials and products. The Construction Industry in Kenya has registered tremendous growth in recent years with a growth of 13.6 per cent in 2015 compared to an expansion of 13.1 and 5.8 per cent for the years 2014 and 2013 respectively (ESR, 2016). Ika, Diallo and Thuillier (2012) observed that World Bank projects mostly failed to achieve their intended objectives due to managerial and organizational challenges from the project initiation, implementation and closure. Hwang and Ng (2013) observed that project performance challenges were mostly due to failure of the project manager to plan, organize and implement project activities competently. Beringer, Jonas and Kock (2013) established that stakeholder behavior and stakeholder management are key to project success. Wanjau (2015) revealed essentials for project success as based on the making of a compelling business case for the project management team by the organization. PMI (2013) established that the project challenges of the US Federal Security Intelligence department could be mitigated through detailed scope planning and collecting stakeholder requirements and use of skilled supplier evaluation teams. Nyaguthii and Oyugi (2013) established a relationship between stakeholder participation in planning, project implementation, participation in project monitoring and evaluation and the success of economic stimulus program (ESP). Yang, Hwang and Wu (2011) established that project manager's teamwork, leadership style influence schedule performance, cost performance, quality performance and stakeholder satisfaction.

2. METHODOLOGY

This research adopted a descriptive study to obtain information about the current status of the phenomenon. A descriptive study is appropriate because it minimizes bias and optimizes on the reliability of data (Mugenda & Mugenda, 2008). The population for this study was all the 177 approved Infrastructure Development projects in Kenya Power and Lighting Company. The study focused on the 177 contractor project managers who were the planners and implementers of the projects and had great knowledge on the planning of infrastructure projects and its influence on project success. A census survey was conducted for this study to minimize the sampling error (Mugenda & Mugenda, 2008). Data was collected using closed-ended questionnaires. Questionnaires were used retrieve demographic information and the opinions of the 177 project managers about how the independent variables influence the dependent variable. A register of all the questionnaires given and received was maintained.

18 subjects were issued with questionnaires to test the reliability of the questionnaires. The subjects participating in the pilot study were not being included in the final study to avoid fatigue. The instrument was adjusted as recommended by the consultants on the suitability and representativeness of the questions, statements and optional responses before issuing the questionnaires for the final data collection for validity. Analyzed data was presented using tables and charts (Ngacho & Das, 2014). Descriptive statistics such as frequency distribution tables were used to capture the characteristics of the variables in the study. Inferential statistics included use of multiple linear regression and bivariate correlation. Inferential statistics was used to analyze the relationship between the dependent variable and the independent variables. The dependent variable was project success while the independent variables were: project scope planning, cost planning, time planning and quality planning. Data was presented using frequency distribution tables and pie charts. Data was presented to highlight the results and relationships. Multiple linear regression was used to determine whether project scope planning, cost planning, time planning and quality planning together predict project success.

The multiple linear regressions equation that was used in this model is:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where:

Y= Project Success

β_0 = Constant Term,

X_1= Time Planning

X_2= Cost Planning

X_3= Scope Planning

X_4= Quality Planning

In the model, β_0 = is the constant term while the coefficients $\beta_i i = 1\ldots\ldots.4$ was used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables X_1, X_2, X_3 and X_4. ε is the error term which captures the unexplainable variations in the model.

3. FINDINGS

The research instrument was piloted on 18 respondents to ascertain its reliability. The study generated a Cronbach's reliability coefficient of 0.746 against the acceptable value of 0.7. The correlation matrix showed that there is a weak positive and statistically insignificant relationship between Scope planning and project success (r=0.129, p=0.109). The study result support the findings of PMI (2013) that revealed that experience in translating customer requirements into project design specifications influence project success. The correlation matrix indicated that there exist a weak positive and statistically significant relationship between Cost Planning and Project Success (r=0.117, p=0.027). The study results support the findings of Sabol (2008) who established that cost planning influence project success and recommended use of building information modelling to plan project cost. The correlation matrix showed that there exist a strong positive and statistically significant relationship between Time Planning and Project Success (r=0.646, p=.000). The study result

supports the findings of Meredith and Mantel (2011) that established that computer software such as Microsoft Project could be used to influence project success through detailed planning and monitoring. The correlation matrix also indicated that there exist a weak positive and statistically insignificant relationship between Quality Planning and Project Success ($r=0.049$, $p=0.542$). The study results support the findings of Duicu, Dumitrascu and Lepadatescu (2013) who established that quality planning, quality assurance, quality control and continuous process improvement influence project success.The correlation matrix showed that there exist a strong positive and statistically significant relationship between Scope Planning and Cost Planning ($r=0.942$, $p=0.000$). The study results imply that the scope of the project determines the budget of the project. The study results support the findings of Wanjau (2015) that revealed that essentials for project success should be based on a compelling business case that defines how successful project completion will contribute to the achievement of strategic and operational goals of the organization.The results presented in Table 1 present the fitness of model used in explaining the study phenomena. Scope Planning, Cost Planning, Time Planning and Quality Planning were found to be satisfactory variables in explaining project success for infrastructure development projects in Kenya. The coefficient of determination (R square) was established as of 48.1%. This means that Scope Planning, Cost Planning, Time Planning and Quality Planning about infrastructure development project implementation explain 48.1% of project success for infrastructure development projects in Kenya. The results show that the model applied to link the relationship of the variables was satisfactory and supports the recommendations of PMI (2013) that scope planning, cost planning, quality planning and time planning influence project success.

Table 1:Model Summary

Indicator	Coefficient
R	0.694
R Square	0.481
Adjusted R Square	0.468

Table 2 shows the results on the analysis of the variance (ANOVA).

Table 2:Analysis of Variance

Indicator	Sum of Squares	df	Mean Square	F	Sig.
Regression	94.768	4	23.692	35.281	.000b
Residual	102.073	152	0.672		
Total	196.841	156			

The results indicate that the overall model was statistically significant. The ANOVA table 4.32 indicates that the independent variables are good predictors of Project Success for infrastructure development projects in Kenya. The F statistic of 35.281 and the reported p value (0.000) that is less than the conventional probability of 0.05 significance level support the study. The $F_{cal}=35.281 > F_{critical}=2.424$ at $\alpha = 0.05$. This implies that Scope Planning, Cost Planning, Time Planning and Quality Planning influence Project Success for infrastructure development projects in Kenya. Regression coefficients are presented in Table 3.

Table 3:Coefficients of Regression

Variable	B	Std. Error	t	Sig.
(Constant)	0.018	0.434	0.043	.966
Scope Planning	-0.439	0.180	-2.438	.016
Cost Planning	0.594	0.180	3.299	.001
Time Planning	0.654	0.058	11.255	.000
Quality Planning	0.155	0.063	2.472	0.015

The regression results show that there is a positive and statistically significant relationship between the independent variables: Scope Planning, Cost Planning, Time Planning and Quality Planning and the dependent variable: Project Success of infrastructure development projects in Kenya. The significant relationships between the all the independent variables and the dependent variable, project success is supported by beta coefficients of -0.439 and a p value of 0.016 for Scope Planning, beta coefficient of 0.594 and a p value of 0.001 for Cost Planning, beta coefficient of 0.654 and a p value

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of 0.000 for Time Planning and beta coefficient of 0.155 and a p value of 0.015 for Quality Planning. The results show that increased Scope Planning would result to decreased Project Success for infrastructure development projects in Kenya by 0.439 units. The study result implies that the scope planning may not be a function of the project team but a function of the customer sponsoring the project and the top management of the consultant for the customer. These results show that an increase in Cost Planning would result to an increase in Project Success for infrastructure development projects in Kenya by 0.594 units. The study results show that an increase in Time Planning would results to increased Project Success for infrastructure development projects in Kenya by 0.654 units. The results further show that an increase in Quality Planning would result to increased Project Success for infrastructure development projects in Kenya by 0.155 units. The multiple linear regressions equation used in this model was:

$$Y = 0.018 + 0.654X_1 + 0.594X_2 - 0.439 X_3 + 0.155 X4 + 0.434$$

Where:

Y= Project Success for infrastructure development projects

In the model, $\beta0 = 0.018$, is the constant term. The coefficients were calculated by SPSS version 22 and found to be: $\beta_1 = 0.654$, $\beta_2 = 0.594$, $\beta_3 = -0.439$ while $\beta_4 = 0.155$ and were used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables X_1, X_2, X_3 and X_4. ε was the error term and was found to be 0.434. The error term captured the unexplainable variations in the model. Inferential analysis was conducted to generate the regression and correlation results. These regression results include the model of fitness, and analysis of the variance and regression coefficients.

4. DISCUSSIONS

The first objective was to assess the role of project management planning on infrastructure development project success in Kenya. 76% of the respondents indicated that collecting stakeholder requirements was key to scope planning since it is the requirements that would form the scope. Results revealed 75.8% of the respondents agreed that scope definition by stakeholders was key to planning the scope of infrastructure development projects. Results revealed that the majority of the respondents (71.3%) agreed that decomposing the project into work packages was very important to scope planning. Majority of the respondents (81.5%) indicated that verification of the scope with the project stakeholders was very key to scope planning since the process enabled the project team to correctly determine all the project activities. Majority of the respondents (86.6%) indicated that scope planning influenced project success for infrastructure development projects. The correlation results showed that there is a weak positive and statistically insignificant relationship between Scope planning and project success (r=0.129, p=0.109). Regression results revealed that scope planning has a negative and statistically significant relationship with project success with a beta coefficient of -0.439 and a p value of 0.016. This implies that an increase in Scope Planning would result to decreased project success for infrastructure development projects in Kenya by 0.439 units. These results contradicts the findings of Meng (2012) who in their study established that poor project performance result mostly from four important factors which are changes in site conditions, shortage of materials and poor contract management. The second objective of the study was to establish the effect of cost planning on the success of infrastructure development projects in Kenya. The results show that 76.4% of the respondents indicated that determining material cost for the projects was key to cost planning. Only 14.7% of the respondents indicated that material cost play no role in cost planning. Majority of the respondents (76.4%) indicated that labor cost determination was very key to cost planning as recommended by PMI (2013). 86% of the respondents indicated that contingency cost determination was key to cost planning to take care of project risks. Only 9.6 % of the respondents indicated that contingency cost was not important in cost planning. 86% of the respondents indicated that the project budget was very important to cost planning since it forms the baseline for measuring project cost performance. Results showed that 38.8% of the respondents indicated that cost planning played a major role in influencing project success. The correlation matrix indicated that there exist a weak positive and statistically significant relationship between Cost Planning and Project Success (r=0.117, p=0.027). Regression results revealed that cost planning has a strong positive and statistically significant relationship with project success supported by a beta coefficient of 0.594 and a p value of 0.001. These results imply that an increase in Cost Planning would result to an increase in Project Success for infrastructure development projects in Kenya by 0.594

units. The study results support the findings of Sabol (2008) who established that cost planning influence project success and recommended use of building information modeling to plan project cost by enhancing stakeholder participation in planning. The third objective of the study was to determine the effect of time planning on the success of infrastructure development projects in Kenya. Majority of the respondents (86%) indicated that determining the sequence of project activities was very important in time planning for the projects. Only 14.1 % of the respondents indicated that activities' sequence was not important in time planning. Majority of the respondents (86%) indicated that activities duration influenced time planning. The respondents were asked to indicate the influence of activities resources on time planning. Majority of the respondents (90.5%) indicated that activities resources influence time planning. 80.9% of the respondents indicated that the project schedule was very important to time planning because it formed the schedule baseline that was used to measure time performance. Majority of the respondents (90.1%) indicated that time planning was key to project success. The correlation matrix showed that there exist a strong positive and statistically significant relationship between Time Planning and Project Success (r=0.646, p=.000).Regression results showed that there exist a strong positive and statistically significant relationship between time planning and project success supported with a beta coefficient of 0.654 and a p value of 0.000. The study results show that an increase in Time Planning would results to increased Project Success for infrastructure development projects in Kenya by 0.654 units. The study results support the findings of Ika (2012) who established that time planning was key to project success.

The fourth objective of the study was to establish the role of quality planning on the success of infrastructure projects in Kenya. The descriptive results revealed that 86.7% of the respondents indicated that the project deliverables influenced how the project quality was planned. Majority of the respondents (75.8%) indicated that deliverable specification determined how project quality was planned in the projects. The study established that 76.4% of the respondents indicated that quality checklist was very important to quality planning. 82.2% of the respondents indicated that quality plan formed the basis for planning activities in the project and influenced quality planning. The correlation matrix also indicated that there exist a weak positive and statistically insignificant relationship between Quality Planning and Project Success (r=0.049, p=0.542).

Regression results revealed that there exist a weak positive and statistically significant relationship between quality planning and project success supported by a beta coefficient of 0.155 and a p value of 0.015 for Quality Planning. The results show that an increase in Quality Planning would result to increased Project Success for infrastructure development projects in Kenya by 0.155 units. The study results supports the findings of Duicu, Dumitrascu and Lepadatescu (2013) who established that project quality processes: quality planning, quality assurance, quality control and continuous process improvement influence project success.

5. CONCLUSIONS AND SUGGESTIONS

The findings of the study revealed that Cost planning play an important role on the success of infrastructure development projects in Kenya. The study also concluded that Time Planning contribute significantly to the success of infrastructure development projects in Kenya. Based on the results, it was possible to conclude that quality planning play a major role on the success of infrastructure development projects in Kenya. The study results found that the effect of scope planning is statistically significant but negatively related to the success of infrastructure development projects in Kenya. This implies that the scope planning function for Kenya Power projects may not be a function of the contractors but determined by Kenya Power though scope planning is significant to project success. Based on the study findings, it is recommended that time planning in terms of determining activities sequence, duration, resources and developing the project schedule should be improved to enhance project success. It is recommended that determination of material cost, labor cost, contingency cost and the project budget be accurately done so as to enhance the chances of project success. The study also recommends that the project deliverables, deliverable specifications, quality checklist and quality plan be accurately determined to enhance chances of project success. The study also recommended that scope planning be improved since it affects project success. The study recommends that future studies should aim at establishing the influence of scope management on project success since the study established that scope planning is significant to project success but could not determine the role played by the project managers.

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