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Influence of Management Ability of Contractors on Performance of Road Construction Infrastructural Projects: Beyond Project Implementation

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Abstract: ***The study objective was to establish how management ability of contractors influences performance of road construction infrastructural projects in Nairobi County, Kenya. The target population for the study was 460 and a sample size of 210 drawn from the same. As per the tools used, 152 questionnaires and structured interview schedules were successfully completed, representing 72.8% return rate. Simple linear regression model was used and a test for significance computed at 0.05 level of significance. Hypothesis was stated in null form for which the following results were recorded: that,*** **R=0.157, R^2=0.025, β=0.124, t=1.956, F(1,151)=3.827, p=0.052>0.05,** ***thus we failed to reject the null hypothesis for lack of sufficient evidence. It was therefore concluded that contractors' management ability does not significantly influence performance of road construction infrastructural projects. This suggests that management ability of contractors explains well the success of the project from the time construction starts to completion phase but not performance.***

Keywords: Management ability of contractors, Road Performance, Infrastructural Projects

1. Introduction

Management of construction works requires dedicated managers. Abiodun, Segbenu and Oluseye (2017) pointed out that to bolster the improvement of contractors' performance in light of construction projects, proper planning, suitable leadership as well as communication ought to be upped. Management is highly associated with contractor performance. Aje, Odusami and Ogunsemi (2009) state that management capacity is a primary criterion for assessing contractors at the prequalification stage as well as tender assessment stage. Haphazard planning as well as scheduling has a potential for mediocre performance by a contractor. If, for instance, certain design associated issues occur, then fast decision ought to be taken by top management to adjust contractor performance. In addition, miscalculated coordination of project activities leads to suboptimal performance of the contractor. Finally, efficient, effective, and economical asset management by a contractor has a potential to impact his performance favorably.

2. Statement of the Problem

The process of selecting contractors for road construction is purposed to eliminate incompetent bidders and yield to a list of qualified contractors and firms that are capable of delivering the project as per set goals. The government of Kenya, through its Vision 2030, has prioritized infrastructural development, hence allocating sufficient budget for realization of this vision. Studies indicate that the main challenge in construction industry in the country is failure for most of the contractors to deliver projects on expected time, expected budget and also meet required quality upon completion (Ogweno, Muturi & Rambo, 2016; World Bank, 2014; Waithera, 2017; Mwakajo & Kidombo, 2017; Wambui, Ombui & Kagiri, 2015; Hassan & Guyo, 2017). Nevertheless, the post delivery performance of the road infrastructure has been of less interest to many scholars and even construction experts in the field of road construction industry and project management, hence the need to investigate it. Studies indicate that contractors' management capacity affect project's implementation but not to the extent to claim absence of performance in the post delivery stage. Some of the issues associated with management in construction industry include poor planning, poor scheduling of activities, managing construction personnel, poor job-site supervision, inadequate management knowledge and contractor experience, lack of team work and proper guidance by the supervisors (Naik, Sharma & Kashiyani, 2015;Omran, Abdalrahman & Pakir, 2012; Aje, Odusami & Ogunsemi, 2009). At this juncture, the study sought to assess how management ability of contractors influences performance of road construction infrastructural projects in Nairobii County, Kenya. The study is also guided by a null hypothesis that management ability of contractors does not significantly influence performance of road construction infrastructural projects in Nairobi County, Kenya.

3. Literature Review

Kenya appears to have made tremendous progress in terms of infrastructure, however, according to Wambui, Ombui and Kagiri (2015) construction industry in the country faces a lot of challenges and complex issues in their performance. Many realistic justifications account for this, namely: closures, amendment of drawings as well as design, and delays in the disbursement of requisite funds.

Other impeding factors in this regard are: mediocre leadership and management; inappropriacy of participants;

bad coordination and inter-personal relations; lack of control, motivation, monitoring or systems to aid decision making; infrastructure inadequacy and political challenges; socio-economic challenges. It was observed by Watt, Kayis and Willey (2008) that appraisal is a demanding task characterized with diverse uncertainties. They came up with the following evaluation criteria typology, namely: workload/capacity; organization ability; physical assets; as well as firm reputation, technical expertise, supplier-client engagement, and method/technical solutions.

It was suggested by Wambui, Ombui and Kagiri (2015) that there is need for continued research on the Key Performance Indicators (KPIs) so as to develop a framework for the causal relationships between the variables in question. In this regard, the current study further pursued the influence of those indicators on post-delivery of road construction infrastructural projects in Nairobi, Kenya. Factors relating to management have been identified by Naik, Sharma and Kashiyani (2015) as follows: inadequacy of relevant information; weak scheduling and planning; inadequate coordination among participants; and poor agility in decision making. The other factors include coordination with other primes; subcontractors' coordination and control; professional misconduct; human resource management; provision of enough workforce, as well as materials and equipment to meet the plan or schedule; on-site supervision quality; daily work log adequacy; conflict resolution; minimization/avoidance of claims; as well as conformance with regulations, laws, inspections, permits, and testing.

Others such as Aje, Odusami and Ogunsemi (2009) evaluated the impact of contactors' management capacity on the time and cost of performance of construction projects in Nigeria. The statistical findings showed that contractors' management capability is a significant criterion in the appraisal of potential construction contractors' performance in the course of prequalification as well as tender assessment. Previous performance and quality thereof, experience of the contractor, management knowledge as well as programme for quality control were also identified as the major yardsticks for assessing contractors' management ability.

It was also discovered that contractors' management capacity significantly impacted cost performance and time, with a p-value of 0.039 and 0.042, respectively; thereby supporting earlier findings that management capacity is among the significant criteria for contractors' prequalification in the Nigeria context (Aje, Odusami & Ogunsemi, 2009). The study findings further revealed that the cost and time of a construction project and performance had a strong correlation with contractors' management ability. Hence, models for prediction of the project completion cost as well as actual time-frame for building projects was validated.

According to Aje, Odusami and Ogunsemi (2009), the above study was intended to facilitate clientele and consultants to measure the time and cost of performance of construction projects in line with the prequalification appraisal of contractors on management capacity, the contract period as well as tender quotations. It therefore implies the possibility to project the actual cycle period and cost of projects from the very beginning based on the foregoing variables. In spite of this, the focus of the study was on building construction, even though the variables are the same as those of the current study on road construction infrastructural projects.

A case study by Omran, Abdalrahman and Pakir (2012) on project performance in the construction industry in Sudan comprised a total of 75 structured research questionnaires distributed randomly, from which 52 were completed and returned. The study utilized the relative importance index (RII) to rank the determinants of project performance. In addition, Spearman's Correlation Coefficient indicated the strength of relationship between the most significant determinants, with the Kruskal-Wallis test being an indication that there were comparison and opinion variations between the respondents. It was established that the most significant five determinants of project performance were: planning effort; experience of project team leader; design and specification adequacy; monitoring for cost progress; as well as the leadership skills.

The study further determined that project managers ought to put together an effective team, and develop a learning culture for better leadership, since good leadership skills can lead to improved productivity by the workers. A conclusion was then drawn that project manager sought to also be aware of the project characteristics, including missed or unclear aspects. Moreover, such managers ought to have adequate experience for the management of the project for problem-solving in the course of project implementation. The study hence avails positive information as to the relationship between management capacity of contractors and performance of road construction projects.

One main reason why quality in road construction is compromised is due to rogue contractors. Ntuli and Allopi (2014) also argue that regardless of the amount of resources dedicated to the contractors, it would add no much value if the tender awards are given to those who do not qualify. Others such as Mwakajo and Kidombo (2017) also did a study of the determinants of project performance among county road infrastructural projects in Manyatta constituency, Embu County, Kenya. The said study revealed that project leadership requires the capacity to undertake tough decisions, deal with human resource issues, and to invoke authority as and when may be necessary in pursuit of a project in light of various constraints. The findings of the research demonstrated that 88% of the respondents concurred that the projects were professionally and accurately led albeit it was only confined to the project completion rather than in the post-delivery phase.

Management commitment is key if the planned design is to be implemented in construction. El-Maaty, Akal and El-Harawy (2016) focused their study on the management of highway projects in Egypt by examining determinants of quality performance. Accordingly, 39 such factors were singled out via a detailed review of literature. The factors were then tabulated in form of a questionnaire, and dispatched to thirteen owners of divided highways, twenty seven owners of regional roads, as well as fifteen

consultants. Respondents' perspectives were then analyzed through the use of fuzzy triangle.

The findings by El-Maaty, Akal and El-Harawy (2016) showed that the most critical parameters that positively impact quality are: owner's inspection team efficiency; owner's clarity of responsibilities for each key stakeholder; unstandardized pavements; experience of the staff involved in the entire project cycle; as well as quality and type of asphalt applied in process of construction. The research nevertheless failed to clearly articulate the data analysis method nor did it demonstrate a linkage among the key study variables. As a result, the intensity of monitoring as well as road construction performance, a conflation between variables was undertaken through inferential statistics.

In a study on the impact of experience and skill inadequacy in the construction sector in Kwazulu-Naatal, South Africa, Ntuli and Allopi (2014) investigated the challenges facing civil engineering contractors for enterprise sustainability. In effect, various challenges were identified, namely: inadequate understanding of the processes involved in tendering; capacity building; cash-flow challenges due to late payment; corruption; procurement policy ignorance; lack of business planning; ignorance of the role of the Construction Industry Development Board (CIDB); inadequate operational as well as managerial skills among contractors; poor pricing; misunderstanding of the general contractual provisions; and challenges relating to sub-contracting. The said study results indicated that there were shortage of skills in the construction sector thereby informing the need for continuous capacity building of those contractors and their employees. The study further proposed that the government, in liaison with relevant stakeholders, ought to set up and execute contractor capacity building programs to cure the skill gap problem.

4. Theoretical Framework

The study was guided by the following theory:

4.1 Theory of Construction Management

The construction management theory was proposed by Radosavljevic and Bennett (2012). They posit that concentration on project management only has limitions in regard to the performance of construction project. The six inherent difficulty indicators were advanced by De Valence (2012) as the basic variables in CM theory; being the main determinants of the most suitable CM strategy. They include: derived linkages between pre-existing interacting teams way before project commencement; time differences in the course of the project with or without inter-team relationships, otherwise called relationship fluctuation; the amount of time taken by teams to work together in the past, otherwise called relationship quality; interaction patterns throughout project life, called relationship configuration; inconsistencies among team performance, called performance variability; and unavoidable factors otherwise referred to as external interference.

Radosavljevic and Bennett (2012) further argue that the progress and development of the construction sector was dependent upon a hybrid of both project and corporate management understanding. The CM theory unveils the argument that construction management aims at efficient and effective completion of construction projects within the set objects. It all begins with the selection of competent project teams for the undetaking of the projects. The team here entails: managers, building team, designers, production specialists, manufacturers, as well as commissioning specialists.

The theory acknowledges the inherent and unavoidable challenges confronting construction teams. It is also founded on the perspective that the key objective of CM is to alleviate such inherent problems. Others such as Seboru et.al, (2016) in a study on the linkage between materials' acquisition and road construction performance in Kenya utilised the theory and established that performance of such projects has a conflation to the theory in question. Hence the theory is used in the current study, more specifically to test its relevance on the predictor variable management ability of the contractor and performance of the road construction infrastructural projects. It is considered important since it explains the reason why successful projects have a direct correlation with the contractor's management ability or capability to oversee selection of competent teams and execution of construction tasks as per the design specifications.

5. Conceptual Framework

The conceptual framework adopted in this study presents the relationship between the independent and dependent variables. Thus, the independent variable was management ability of contractors whereas the dependent variable referred to performance of road construction infrastructural projects. Figure 1 illustrates this relationship in detail.

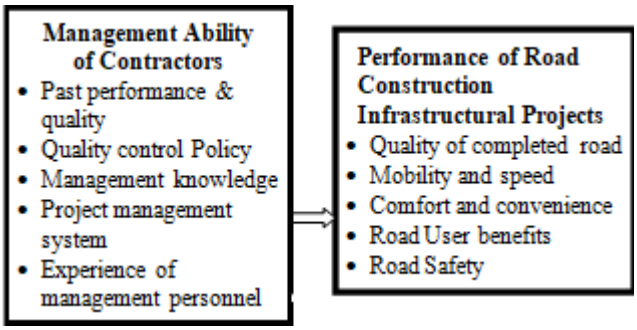

Figure 1: Conceptual Framework of Management Ability of Contractors and Performance of Road Construction Infrastructural Projects (Source: Authors 2020)

6. Research Methodology

The study embodied a pragmatic research paradigm and mixed method approach by employing descriptive survey research design and correlation research design. The target population for this study was 460 accounting for road contractors and public service drivers, out of which we obtained a sample of 210 by use of Krejcie and Morgan

table. The drivers are found on two routes: Outer Ring Road and Eastern Bypass Road within Nairobi County in Kenya. A pilot study conducted was aimed at improving the validity and reliability of the research tools (Frankfort-Nachmias & Nachmias; Benard, 2000). Content validity and construct validity were used in this study. Testing of reliability was done through Cronbach's Alpha reliability coefficient test. Descriptive data was presented in frequencies, percentages, means and standard deviation. Inferential statistics was performed to find out how the predictor correlated with the outcome. Simple linear regression was done using Analysis of Variance (ANOVA). Qualitative data collected was analyzed in thematic form. Ethical issues were observed whereby a letter of authority was sought from the National Commission for Science, Technology and Innovation (NACOSTI) prior to embarking on data collection in the field. Questionnaires were administered to road contractor and interview schedules were distributed to the Public Service Vehicles (PSVs) drivers, also referred to as matatu drivers.

Questionnaires were administered to 210 respondents, comprising 106 contractors and 104 PSV matatu drivers. Out of these, 153 were filled and returned, representing questionnaire return rate of 72.8%. Enshassi, Mohamed and Abushaban (2009) recorded a response rate of 73% whereas Nyangwara and Datche (2015) recorded 73.3%. The response rate of 72.8% in the current study, therefore, met the criteria set by Saunders, Lewis and Thornhill (2009) and Mugenda and Mugenda (2003) which is 50% and 70% respectively. This was enough to carry out inferential analyses.

7. Results and Findings

7.1 Descriptive Analysis

7.1.1 Descriptive Analysis Performance of Road Construction Infrastructural Projects

The results in Table 1presents the quantitative views of the respondents to describe the phenomenon.

Table 1: Descriptive Analysis of Performance of Road Construction Infrastructural Projects

Variable Dimension/Indicator	*Mean (M)*	*Std. Dev.*
1. Quality of completed road in terms of condition of drainage systems and water table	3.05	0.834
2. Mobility and speed in terms of delays, congestion, average travel speed	4.16	0.544
3. Comfort and convenience in terms of smoothness and roughness of the road	3.41	1.209
4. Road user benefits in terms of cost reduction, vehicle operating cost reduction	3.57	1.000
5. Road Safety in terms cases of accidents, road signage, bumps, foot bridges, bus stops and pedestrians walkways	3.12	1.017
Composite mean and standard deviation	**3.36**	**0.297**

In Table 1, the means of 5 items used to generate data on performance of road construction infrastructural projects were summed up and used to compute the composite mean and standard deviation that resulted to 3.36 and 0.297 respectively. On quality of roads, the mean obtained was lower than the composite mean of 3.36 implying that roads' drainage system is wanting and need to be corrected. This goes to explain the poor water table that becomes a huge problem during raining seasons.

It is also evident (Table 1) that mobility and speed has significantly improved since generally the average travel speed is good and unlike in the past, congestion and delays are not being experienced on the new roads (mean of 4.16 higher than 3.36 composite mean).

In respect to comfort and convenience (Table 1), a mean of 3.41 above the composite mean of 3.36 was obtained which is a clear indication that the texture of the road is good, skid resistance is not also a problem even though flooding is still a challenge as it was reported by the respondents from the interviews conducted.

The road has also resulted to significant road user benefits as far as cost reduction, time taken to travel and most importantly the vehicle operating costs. The respondents reported that vehicle breakdowns have reduced as well thus making the performance of road good. This is explained by a mean of 3.57 slightly higher than the composite mean of 3.36 (Table 1).

It is however critical to note that road safety is still the biggest challenge as it was reported by the respondents that bumps are not in designated places along the roads. Moreover, pedestrians' walkways are not adequately provided and also insufficient footbridges. There is also a challenge of bus stops for the PSV drivers. A lower mean of 3.12 compared to the composite mean is a clear indication that contractors safety record must be keenly assessed to ascertain and establish their suitability to do the work (Table 1).

7.1.2 Descriptive Analysis Management Ability of Contractors

The results in Table 1presents the quantitative views of the respondents to describe the phenomenon.

Table 2: Descriptive Analysis of Contractors Management Ability

No.	Statements	Mean	SDV
	(a) Past performance and Quality		
1.	Contractors current performance is influenced by past performance significantly	4.10	1.093
2.	Previous management commitment can easily be repeated in the current road performance	4.33	0.538
3.	Road performance depends on the leadership guidance	4.41	0.591
	(b) Quality control policy		
4.	A firm's quality control policy has significance on road performance	4.55	0.537
5.	Construction contractors are obligated to have a quality control policy to ensure road performance	4.33	0.574
	(c) Management Knowledge		
6.	Contractors have management knowledge hence road performance	4.03	1.227

No.	Statements	Mean	SDV
7.	Management knowledge in construction is necessary to ensure road performance	4.72	0.493
	(d) Project Management system		
8.	A proper management system will provide proper oversight in construction	4.61	0.527
9.	Most contractors have the necessary project management system	4.44	0.536
	(e) Experience of management personnel		
10.	The number of years of the management personnel in road construction guarantee road performance	3.73	1.102
11.	Most of the construction contractors operate with management teams that meet minimum requirement in terms of experience	3.45	0.993
12.	Experience of management personnel in construction does guarantee highly well done road	2.04	1.152
	Composite mean and Standard Deviation	**4.06**	**0.346**

In Table 2, the means of 12 items used to generate data on management ability of contractors were summed up and used to compute the composite mean and standard deviation that resulted to 4.06 and 0.346 respectively. When the line item mean was equal or above or higher than the composite mean, then that item influenced the variable positively and vice versa.

Statement one, contractors current performance is influenced by past performance significantly. A rising from this line item was a highest mean of 4.10 against the composite mean of 4.06, which supported the notion that current performance of a contractor(s) is influenced by past performance. With a standard deviation of 1.093 and a composite standard deviation of 0.346, the respondents' views were divergent.

Statement two, previous management commitment could easily be repeated in the current road performance. A mean of 4.33 compared to composite mean of 4.06 indicated that current project performance could be due to contractor's previous management commitment. The respondents' opinions were inconsistent, given a higher standard deviation of 0.538 compared to the composite standard deviation of 0.346.

Statement three, road performance depends on the leadership guidance. A higher mean of 4.41 generated on this line item compared to the composite mean of 4.06 implied that project performance depends or is associated with leadership guidance. Respondents' views were divergent considering the standard deviation of 0.591 was higher than the composite standard deviation of 0.346.

Statement four, a firm's quality control policy has significance on road performance. A higher mean of 4.55 compared to the composite mean of 4.06 which implied that quality control policy significantly influences road performance and hence the need to use it during contractors' evaluation process to get rid of incompetent contractors. A higher standard deviation of 0.537 compared to 0.346 the composite standard deviation is an indicator that opinions diverged.

Fifth statement, construction contractors are obligated to have a quality control policy to ensure road performance. A mean of 4.33 compared to the composite mean of 4.06 implying that contractors have an obligation to obtain a quality control policy to ensure project performance. A standard deviation of 0.574 compared to the composite standard deviation of 0.346 indicating that the expressed opinions were collectively inconsistent.

Statements six, Contractors have management knowledge hence road performance. A mean of 4.03, closer to the composite mean of 4.06 was realized implied that, although some contractors may have have some little management knowledge, there is critical need for contractors in road construction to hire professionals trained in project management, or undertake project management courses to enhance their management skills, hence road performance. The opinions were rather divergent, given a higher standard deviation of 1.227 against a composite standard deviation of 0.346.

Statement seven, management knowledge in road construction is necessary to ensure road performance. A mean of 4.72 greater than the composite mean of 4.06 implied that management knowledge is very necessary in road construction infrastructural projects. A standard deviation of 0.493 compared to a standard deviation of 0.346 proved that respondents' opinions were inconsistent with one another.

Statement eight, a proper management system will provide proper oversight in construction. The mean was 4.61 higher than 4.06 implied that a proper management system would ensure onsite construction operations. It also means that if road contractors are keen on having a functional management system then cases of deviation in road designs or planned would highly be avoided. A standard deviation of 0.527 was higher than the composite standard deviation of 0.346 indicating that opinions were diverging.

Statement nine, most contractors have the necessary project management system. A mean of 4.44 with was higher than the composite mean of 4.06. This implies that construction firms have necessary project management system but they need to effectively use it; if road performance has to be realized. A higher standard deviation of 0.536 was obtained on this line item compared to the composite standard deviation of 0.346, hence divergence of opinions.

Statement 10, the number of years of the management personnel in road construction guarantees road performance. A lower mean of 3.73 compared to a composite mean of 4.06 obtained implied that the number of years a management personnel has had in road construction cannot guarantee performance. A standard deviation of 1.102 was higher than the composite standard deviation of 0.346 demonstrating a sharp inconsistency in opinions among the respondents.

Statement 11, most of the road construction contractors operate with management teams that meet minimum requirements in terms of experience. This implies that not all (most) contractors are able to hire management teams that meet minimum requirement and this could be due to the cost

of hiring of these professionals in the market. A higher standard deviation of 0.993 obtained was higher than the composite standard deviation of 0.346 which implied that opinions were divergent.

Statement 12, experience of the management personnel in construction does guarantee highly done road. A line mean of 2.04 below the composite mean of 4.06 indicated that a well done road or a quality road would not be guaranteed by the mere experience of the management personnel in construction. Therefore, this implied that there is need to support the management team with proper team and resources to contribute to a better final product. Furthermore, a standard deviation of 1.152 compared to a composite standard deviation suggested that the opinions were inconsistent.

Results of interviews with road construction engineers indicated that management ability influenced largely the performance of road construction infrastructural projects. The results of the interviews were, therefore, consistent with the quantitative data. The following are key responses obtained from the road construction engineers:

*"Good management skills will always lead to proper co-ordination of duties hence quality output; poor management leads to intermitted work, unrests or strikes, demonstration among work team; lack of morale due to delayed payments or salaries and this derail the effort of the team to work towards a good product; management can not entirely influence road performance because managers need adequate financial support to build quality roads; good management ensures discipline among workers, easy to lead, direct, supervise hence good performance; it also means the work done is being thoroughly supervised and given the needed attention; management of road projects is highly required during implementation of the project but performance is determined by other factors especially by the road user." (*Road Construction Engineers' Opinions, 2019)

Results of interviews with public service vehicles (PSVs) drivers indicated management ability influenced largely the performance of road construction infrastructural projects. The results of the interviews were, therefore, consistent with the quantitative data. The following are key responses obtained from the PSVs drivers:

*"If contractors and their subcontractors can provide the required management on the site, then definitely we are likely to witness quality products of our own roads; proper management will provide oversight during construction and this means that, for example, materials are mixed properly and no wastage minimized; if a contractor is committed to providing necessary oversight during construction, then definitely the technical team on the ground will tend to produce a good road as per the expectation of the client who is in most cases the government and us as the citizens are that government; management also needs to communicate a clear system otherwise things will be done in a hurry and without following due diligence to ensure conformity to road specifications as planned or designed in the work plan; sometimes it is not proper to lay blame on contractors management capability because we as the drivers what we witness on these roads like heavy trucks are putting pressure on the road leading to early deterioration; contractors management ability has got nothing to do with the performance of the road; management of projects requires highly skilled personnel but that is only applied when building the projects but performance needs our own discipline like stop overlapping" (*PSVs Drivers' Opinions, 2019)

7.2 Inferential Analysis of Management Ability of Contractors and Performance of Road Construction of Urban Road Transport Infrastructure Projects

The objective of this study was to examine how combined stakeholder participation in project lifecycle management influences the completion of urban road transport infrastructure projects in Kenya. The combination of participation in project initiation, participation in project planning, participation in project execution and participation in project closure was referred to as combined stakeholder participation in project lifecycle management. The combined influence of these factors on completion of urban road transport infrastructure projects was tested using inferential statistics.

7.2.1 Correlation between Management Ability of Contractors and Performance of Road Construction Infrastructural Projects

Correlation analysis using Pearson's Product Moment technique was done to establish the relationship between the various dimensions of management ability of contractors and performance of road construction infrastructural projects. The values obtained from the correlation analysis ranged between +1 and -1. In this regard, +1 implied perfect positive correlation, while -1 implied perfect negative correlation.

Having 0.000 implied no correlation; the modular values 0.001 to 0.250 implied weak correlation; 0.251 to 0.500 implied semi-strong correlation; 0.501 to 0.750 implied strong correlation; and 0.751 to 1.000 implied very strong correlation. The results were shown in Table 3.

Table 3: Correlation Matrix of Management Ability of Contractors and Performance of Road Construction Infrastructural Projects

Variables		Performance of Road Construction Infrastructural Projects	Management Ability of Contractors
Performance of Road Construction Infrastructural Projects	Pearson Correlation	1	0.057
	Sig. (1-tailed)		0.485
	n	153	153

Management Ability of Contractors	Pearson Correlation	0.057**	1
	Sig. (1-tailed)	0.485	
	n	153	153

As shown (Table 3), at 0.05 level of significance, there was statistically insignificant correlation between management ability of contractors and performance of road construction infrastructural projects (p-value<0.05). The correlation, according to the foregoing measurement framework was weak since the correlation coefficient was 0.057.

7.2.1 Regression Analysis between Management Ability of Contractors and Performance of Road Construction Infrastructural Projects

The objective was to establish how management ability of contractors influences road construction infrastructural projects performance in Nairobi County, Kenya. The dependent variable was performance of road construction infrastructural projects.

The independent variable was management ability, operationalized by the indicators: past performance; quality control; management knowledge; project management system; and experience of management personnel.

Test of Hypothesis

The following hypothesis was tested using linear regression model to meet the requirements of the third objective:

H_0: Management ability of contractors does not significantly influence performance of road construction infrastructural projects.

H_1: Management ability of contractors significantly influences performance of road construction infrastructural projects.

The null hypothesis was tested using the below linear regression model:

$y = a + b_3X_3 + e$

Where:

y - Performance of road construction infrastructural projects
X_3- Management ability of contractors
b_3 – Regression coefficient
a – Regression constant
e – Error term

The results are presented in Table 4

Table 4: Embedded Table of Model Summary, ANOVA and Model Coefficients for Management Ability of Contractors and Performance of Road Construction Infrastructural Projects

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.057[a]	0.003	-0.033	0.29768

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig
1	Regression	0.043	1	0.043	0.491	0.485[b]
	Residual	13.381	151	0.089		
	Total	13.424	152			

Regression Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	**Beta**		
1	(Constant)	3.16	0.284		11.117	0
	Management Ability of Contractors	0.049	0.07	0.701	6.217	0.485

Predictors: (constant), Management ability of contractors
Dependent Variable: Performance of road construction infrastructural projects.

From Table 4, the use of ANOVA revealed the regression model's goodness of fit. It was established from the model that the f-significance value of p=0.485 was greater than 0.05 (p= 0.00 >0.05). The calculated F (0.491) was insignificantly less than the critical value of F= 3.904. Therefore, the model was insignificant.

The degree and nature of correlation between management ability of contractors and performance road construction infrastructural projects was determined by the "R" at 0.057 (Table 4). This demonstrates that despite a weak correlation, management ability would still to a smaller extent influence performance of road construction infrastructural projects. A coefficient of determination R^2 = 0.003 implies that 0.3% change in performance of road would be explained by the management ability. At this juncture, 99.7% change in performance of road construction infrastructural projects is explained by other factors outside the management ability of contractor model. This means that management ability cannot be used to explain performance of roads being used, after completion. The value obtained here is almost insignificant.

The results (Table 4) further indicate that management ability had statistically significant influence on performance of road construction infrastructural projects {β=0.049, t=0.701, F(1,151)= 0.491,p=0.485>0.05}. The beta (β) coefficient for management ability of contractors is 0.049. The beta value imply that a unit increase in performance of road construction infrastructural projects corresponds to 4.9% increase in management ability of contractors.

Using the statistical findings, the regression model can be substituted as follows:

$y = 3.160 + 0.049X_3$

Where:

y - Performance of road construction infrastructural projects
X_3 - Management ability of contractors

The predictor variable management ability of the contractors (Table 4), the probability of the t statistic (0.701) for the b coefficient is 0.485>0.001 which is greater than the level of significance 0.05. Based on this results, we fail to reject the null hypothesis that the slope associated with management ability is equal to zero (b=0). Hence, it was concluded that

management ability of contractors had insignificant influence on performance of road construction infrastructural projects. Even though, the b coefficient associated with management ability of contractors (0.049) is positive, indicating a direct relationship.

The findings of the objective were linked to the previous empirical investigations that had earlier been reviewed. For example, a study by Aje et al. (2009) evaluated the impact of contactors' management capacity on the time and cost of performance of construction projects. The statistical findings showed that contractors' management capability was a significant criterion in the appraisal of potential construction contractors' performance in the course of prequalification as well as tender assessment. Although the current study shows management ability of a contractor does not have much influence on performance road infrastructure, and even the extent to which that is explained is very minimal (5.7%). This is further revealed by the findings from the descriptive analysis on contractors management ability that: the number of years of the management personnel in road construction does not guarantee road performance (line item mean of 3.73 against a composite mean of 4.06); most of construction contractors do not operate with management teams that meet minimum requirements in terms of experience (3.45 line item mean as opposed to 4.06 composite mean); and finally, experience of management personnel in construction does guarantee highly well done road was refuted by a line item mean of 2.04 against 4.06 the composite mean.

A study by Omran, Abdalrahman and Pakir (2012) established that the most significant five determinants of project performance were: planning effort; experience of project team leader; design and specification adequacy; monitoring for cost progress; as well as the leadership skills. Others such as Ntuli et al., (2014) determined that regardless of the amount of resources dedicated to the contractors, it would add no much value if the tender awards are given to those who do not have management capacity. The findings of the current study allude that previous management commitment can easily be repeated in the current road performance (line item mean of 4.10 against composite mean of 4.06) and that road performance depends on the leadership guidance (line item mean of 4.33 against 4.06 the composite mean) which is in support of Mwakajo and Kidombo (2017) who revealed that project leadership requires the capacity to undertake tough decisions, deal with human resource issues, and to invoke authority as and when may be necessary in pursuit of a project in light of various constraints. The findings of the research demonstrated that 88% of the respondents concurred that the projects were professionally and accurately led albeit it was only confined to the project completion rather than in the post delivery phase. Hence the findings of the current study show that performance during post-delivery of the project can not be blamed on the contractors' ability to manage projects.

The findings also fails to resonate with El-Maaty, Akal and El-Haraway (2016) study that showed that the most critical parameters that positively impact quality are: owner's inspection team efficiency; owner's clarity of responsibilities for each key stakeholder; unstandardized pavements; experience of the staff involved in the entire project cycle; as well as quality and type of asphalt applied in process of construction. Accordingly, Naik, Sharma and Kashiyani (2015) noted that contractors' inadequacies revolved around issues to do with weak planning and scheduling, lack of adequate relevant information, poor agility in making of decisions and inadequacy in coordination among the participants. To this point, the current study has revealed that having a proper management system would provide proper oversight in construction to completion only (line item mean of 4.61 against a composite mean of 4.06). However, these findings can only be linked to initial stages of road construction indicating that during the life of the project or in the post-delivery stage, management factors cannot be used to gauge road performance. The objective was therefore supported by data since management ability of a contractor was found to insignificantly influence performance of road construction infrastructural projects. In relation to the foregoing comparable studies, the current study has adduced empirical evidence in support of their earlier findings.

8. Conclusion

The objective of the study was to establish how management ability of contractors influence performance of road construction infrastructural projects. The corresponding null hypothesis was that management ability of contractors does not significantly influence performance of road construction infrastructural projects in Nairobi. The testing of the null hypothesis showed that: $R=0.157$, $R^2=0.025$, $\beta=0.124$, $t=1.956$, $F(1,151)=3.827$, $p=0.052>0.05$. The R coefficient of 0.157 implied there is a weak correlation between management ability of contractors and performance of road construction infrastructural projects. The R^2, 0.025 implied that management ability of contractors explained 2.5% of the variation of performance of road construction infrastructural projects. The F statistic of 122.235 was statistically insignificant an implication that the model was insignificant and as such we failed to reject the null hypothesis. This is a pointer that management ability of contractors does predict implementation of projects but not performance of roads in the post delivery stage.

9. Recommendation

Based on the findings that management ability of contractors only accounts for 2.5% variation in total on performance of road in post delivery stage, we recommend that this variable would be of best use if left to explain performance at the completion phase of the road projects. More other factors or variables need to be studied to find out where failure in performance is an issue in road projects.

10. Further Studies

First, we propose a similar study to be conducted in building construction. Secondly, this study may be conducted in other Counties in Kenya since the findings of this study may not be best suited for generalization for all geographical locations in Kenya. The predictor variable, management ability, would be combined with other variables under the same family, to

ascertain its unique contribution. The other variables may include: financial ability, technical ability, and contractors' safety record.

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