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Moderating Influence of Process Monitoring on the Relationship between Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects

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Abstract

The quality of road infrastructure is dependent on many factors including materials used and contractor competency in terms of managing the project and the team. Poor workmanship has been mostly blamed on these factors. Kenya and Africa at large has realized the road to grow economy is through infrastructural development projects hence investing billions of money into this noble course. Although many studies have been conducted on road construction, the focus is always drawn on the implementation phase thereby forgetting the post-delivery phase. The study aimed to assess the moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural project in the context of Nairobi county, Kenya. The study used both a cross-sectional descriptive survey research design and correlation research design. A sample size of 210 was obtained from a target population of 460 comprising of 106 contractors and 104 Public Service Vehicles (PSVs) drivers. Stratified sampling and proportionate sampling were used to arrive at the right sample size. Simple random sampling helped in distribution of research instruments. Pilot test was done to ensure validity and reliability of research instruments is achieved. Validity of instruments was done by use of content validity to ensure research questions aided in achieving research objective. To maintain reliability of data, Cronbach alpha values of above 0.7 were deemed important. Questionnaires were administered to contractors registered by National Construction Authority of Kenya whereas structured interview schedules were distributed to the drivers in Nairobi County. In total, 153 (72.8%) of response rate was recorded. Quantitative data was descriptively analyzed whereby measure of central tendency and dispersion was done through means and standard deviation. Karl Pearson Correlation Coefficient was used to show relationship between variables under the study. Hypothesis was tested by use of Analysis of Variance (ANOVA) whereby multiple regression and hierarchical analysis were conducted to explain the direction, the strength and the nature of relationship between the study variables. The results showed that in both step one and two, F-values were statistically significant. That in step one R=0.826, adjusted R2=0.673, F (4,148)=79.226, p=0.000<0.05 and in step two: R=0.837, adjusted R2=0.690, F (5,147)=68.520, p=0.000<0.05. This implies that contractors' capacity evaluation in tender award alone explains 67.3% of variation in road performance. However when put together with process monitoring they explain 69.0% of total variation in road performance. Thus the null hypothesis was rejected and alternate hypothesis accepted that process monitoring significantly moderates the relationship between combined factors of contractors' capacity evaluation in tender award and performance of road construction infrastructural projects. The study concludes that process monitoring indeed moderates contractors' capacity to carry out construction work and hence road performance. The study further recommends that future road construction should aim to incorporate process monitoring in its operations to ensure that the right inputs or resources are utilized to yield quality outputs and that the required standards, policies and laws are adhered to.

Keywords: Process Monitoring • Contractors • Capacity • Road Performance • Infrastructural Projects • Contractor Evaluation

Introduction

Rapid economic development coupled with an upsurge in the degree of motorization has in the recent times shaped the dynamics of urban transport system in Kenya. Atieno and Muturi argue that inappropriate infrastructure emerged under the Economic Recovery Strategy (ERS) for Wealth and Employment Creation of the period 2003-07 [1]; it was identified as a key limit to the ease of doing business. Moreover, Kenyan Vision 2030 acknowledges infrastructure as significant beacon for sustainable development as enshrined in the economic pillar. Zenabu and Getachew assert that the various stakeholders often consider construction project completion within budget as a major criterion for project success [2].

An appraisal report by African Development Fund stated that the stock of transport infrastructure in Nairobi is lagging the prevailing demand as demonstrated by the 2006-2025 Master Plan for Urban Transport in the Nairobi Metropolitan Area [3]. It was noted by Onyango, Bwisa and Orwa that in order to release economic prosperity and well being in a developing country like Kenya, it is paramount that the focus should be on infrastructure projects [4]. According to the Kenyan Vision 2030, among the significant determinants of sustainable economic advancement is the infrastructure sector. The Vision further further articulates that this is particularly the case for six major sectors of the economy, namely: business process outsourcing, tourism, financial services, manufacturing, agriculture and livestock, as well as the wholesale and retail businesses [5]. The said blue print acknowledges the vitality of infrastructural development to the social as well as economic transformation. Accordingly, the sector is a major inspiration to the country with international standard modern metropolitan cities, municipalities and towns.

Contextually, the current study focuses on the Eastern Bypass and the Outer-Ring roads. Started in January 2011 and completed in May 2012, the Eastern Bypass project in Nairobi joins Mombasa road at the Cabanas interchange. It runs through Pipeline as well as Utawala Estates via Kangundo Road. It then proceeds to the Thika Super Highway which is equally recent. This part of the road is 39 km in length, made of Asphalt Concrete pavement and classified B class type of road [7]. The bypass has two lanes, it is a two-way single carriageway, each 9 m wide, with an open channel earth surface drain on either side. Its main objective was to assist ease the traffic congestion along Mombasa Road, via Uhuru Highway and into Waiyaki Way.

Approximately 13Km in length with a 2-lane carriageway, the Outer–Ring road is important for the urban transport system in Nairobi. The extent of service was originally low with average journey speed of between 12 and 15kmph. Majority of the port of Mombasa bound freight traffic from Thika Road as well as the Public Service Vehicles (PSVs) use this road from the industrial set-ups in the area. The Government of Kenya, through KURA, improved the road to facilitate easy traffic flow as well as make traffic movement conflations with key corridors such as Nairobi – the Eastern Bypass, Thika Highway, and Nairobi – Mombasa Highway better. The Outer-Ring road links Mombasa Road (A109) and Thika Road (A2) trunk roads [3]. It commences at the junction off GSU along Thika road and

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terminates at the Eastern bypass road. It traverses the industrial set-ups from GSU to Mathare River Crossing, at Jogoo Road and Outering Junction up to Ngong River and after Tassia Estate. Commercial banks, fuel stations, retails outlets, residential estates as well as market centers are the major establishments along this road, with the highest density experienced at Donholm, Umoja, Kariobangi, Huruma, and Dandora estates.

These mega public sector construction (PSC) projects require competent contractors for effective and efficient performance. The ability to select the appropriate contractor is pivotal to the sector and can heal the problem of compromised project performance such as delayed completion, poor quality and cost overruns. Quality of the road could be determined in the post-delivery stage whereby the user (Public Service Vehicle driver) can attest to that.

Statement of the Problem

Inspite of having a performance based framework for evaluating suitable contractors for road works, the performance of road construction is overlooked and attention drawn to implementation phase of the project. From the reviewed empirical literature, the influence of the variables of contractors' capacity evaluation in tender award (financial ability of contractors technical ability of contractors, management capacity of contractors and lastly contractors' safety record) has been established in most of construction infrastructural projects up to implementation stage. For instance, studies on the influence of financial capacity of contractors have been done specifically focusing on project implementation [7-10]; but not on performance. Some studies have also pointed out contractors' management inadequacy and project completion [11-13]. The technical aspects in terms of quality of raw materials, the equipment used and the use of skilled labour have been proved to influence road construction. Safety of roads is key whether during construction phase or when the road is finally handed over for use (post-delivery phase). Some of the issues around a contractor safety record revolve around inadequate regulations, poor management commitment to use of signage and barricades to minimize unnecessary accidents and adequate standards to address safety outcomes [14-16]. Similarly, for those studies done in Kenya, road safety remains a concern during implementation and little or no attention is paid to road performance upon road completion. The need and importance of incorporating monitoring and evaluation in infrastructural projects has been broadly emphasised [17-20]. However a gap exists in terms of process monitoring. In this regard, the study aims to assess the moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects.

Objective of the study

To assess the moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects in Nairobi County, Kenya.

Research question

In what ways does process monitoring moderate the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects in Nairobi County, Kenya?

Hypothesis of the study

H_0: Process Monitoring does not significantly moderates the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects in Nairobi County, Kenya

H_1: Process Monitoring significantly moderates the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects in Nairobi County, Kenya

Literature Review

Performance of road construction infrastructural projects

In practice the word "performance." is multidimensional. Therefore, it entails key performance indicators (KPIs), whose origins are traceable to Australia, and which implies the specified road network contracts' performance; measures of performance, which are its conceptualization according to the Transport Association of Canada's (TAC) survey of Canadian Road Networks; performance indicators as they are used in the European Harmonization on Performance Indicators [21]. The terminologies: performance indicators; key performance indicators; and performance measures have fondly as well as interchangeably been used in the road construction sector.

There is wide literature onto what constitute project success. Omran, Abdalrahman and Pakir claim that the success of construction project is determined by time-performance, budget-performance, and quality standard-performance [22]. There have been substantive arguments on performance measurement as noted by Neely who describes the research into performance measurement as a revolution, he notes that 3,615 article have been published and a new book on the subject was published in 1996 [23]. Scholars such as Bassioni, Price and Hassan assert that construction companies have so far implemented some performance measurement frameworks, such as European Foundation for Quality Management (EFQM) excellence model, KPI, and the Balanced Scorecard [24]. Each of these frameworks evaluates performance measurement from different perspective that either complement each other or even overlap with each other. These frameworks point out significant variables to consider in measurement of project performance. According to Ogweno, Muturi and Rambo, project performance of road works can be measured on timely completion of the road within the scope, cost, and at the appropriate level of performance, as determined by the consumer, end-user consummation with the project and the project utility [25].

This is in tandem with the assertions by Shenhar, Levy and Dvir that project success can be separated into four elements [26]: customer impact, project efficiency, business accomplishment and preparation for future. However, Sadeh, Dvir and Shenhar later outline five dimensions: user-advantage, developing firm benefits, meeting the design goals, benefit to the national infrastructure and defense [27]. Obare, Kyalo Mulwa and Mbugua focused their study on the project control framework, diversity of the project team training and the rural roads' construction project performance in Kenya: the specific dimensions in this regard included timely, budgetary and quality completion of projects [28]. Other dimensions under focus in this regard were customer, and project team satisfaction [28]. The fundamental criteria for performance of construction projects according to Thomas, Palaneeswarm and Kumaraswamy are: work progress; quality standards; health and safety; fiscal stability; asset utilization; as well as the quality of relationship with consultants, clients, and subcontractors [29]. Other criteria according to this same framework are claim and contractual disputes, as well as reputation and subcontracting levels.

The terminology "performance." is often used in economics, engineering, and other disciplines. However, it has both general and specific dimensions. From the latter perspective, and more so in the road construction context, the concept ought to be measurable. This is because it is very necessary for the assessment of prevailing and expected road infrastructure outlook, in addition to the institutional service efficiency as well as provision of safety to the ultimate users. It is also critical for cost-effectiveness, productivity, environmental conservation, investment preservation and related functions [21]. Rao, Kumar and Kumar on the other hand, summarized fifteen performance assessment conditions that covered contracting company attributes; potential and past performances, experience record, fiscal stability as well as project-specific criteria, contractor evaluation considerations [30].

These main contractor selection or evaluation criteria are further broken down to sub-criteria as follows [30]: firstly, the attributes of the contracting concern include age (imputing "experience") and contractor's firm registration. Others are experience, implying past record of undertaking projects of similar type and size; and contractor's past performance would be explanatory of the work quality in previously completed projects, time-performance (adherence to schedule in previous work). The other factors include any case of blacklisting in prior projects, as well as the quality of service within the defect-liability window period, as well as contractor' fiscal capacity assesses the contractor based on prevailing commitments as well as turnover; moreover, the contractor's potential performance which seeks to assess him/her based on the requisite asset availability, and existing workload.

Contractors' capacity evaluation in tender award

Contractors' capacity evaluation in tender award for this study is limited to the prequalification and bidding processes. In the other words, the study incorporates key factors used to assess the contractors' ability to deliver quality roads. Rashvand, Majid, Baniahmadia and Ghavamirad point out that the choice of an appropriate service provider for a construction project is among the fundamental decisions confronting a client for the project development [31]. On one hand, this assertion is in tandem with Chiang, Yu and Luarn who claim that project owners should select contractors with capability to meet quality expectations, cost, and time [32]. On the other hand, Dwarika and Tiwari observe that many countries currently use bid assessment and contractor pre-qualification techniques, and this whole process entails the development and broad assessment of requisite as well as suitable decision criteria to adjudge the overall contractors' suitability [33].

This selection of a contractor is most relevant since, service providers might fail to fulfil contractual obligations; thus, pre-qualification of contractors is an important stage especially at the beginning of a project. In view of Trivedi, Pandey &

Bhadoria, the selection of construction contractor in general contains two stages namely prequalification and bid evaluations [34]. However, Hatush and Skitmore hold the view that bid evaluation as well as contractor pre-qualification decisions consist of the analysis of three main elements:

- Contractors' overall information
- Prequalification yardstick, and
- Bid evaluation benchmark [35].

Pre-qualification is a procedure to examine and gauge the competency and skills of contractors to successfully complete a project if it is given to them. During the pre-qualification stage, service providers are invited to apply for a project, and they are normally evaluated based on a pre-determined criterion that is utilized to short-list them.

Conversely, during the bid evaluation stage, the contractors who are shortlisted during the pre-qualification stage are, once again, invited for further scrutiny. The capacity of each applicant was compared with the predefined sets of minimum values. Researchers in earlier studies have shed more light on this process [36,37]. Pre-qualification avails to a client, a list of contractors who are regularly invited to tender. This approach is the most popular among nations, and it is from the said list that various criterion types are used to assess the aggregate contractor suitability [35].

According to Hatush and Skitmore, the procedure for the evaluation of tender bid submissions by prequalified contractors is called bid evaluation [35]. Herbsman and Ellis, for instance, suggested a multi-parameter system for the evaluation of bids [38]. According to this framework, both primary and auxiliary criteria ought to be considered in the process, the primary factors are the bid quantity; execution time; as well as the quality of prior work. Over and above the foregoing basic parameters, secondary factors too ought to be considered.

It is agreed that financial ability of a contractors is necessary for procurement of construction materials even though some contractors face under-capitalization challenges hence poor quality of completed roads [39,40]. In view Omran, et.al contractors' technical ability in terms of knowledge and skills remains crucial in road construction to limit cost estimate risks [12]. Therefore technical ability can influence construction design [41]. Aje, et.al posit that management capacity is a primary criterion that needs to be used to assess contractors at the prequalification and tender assessment stage [13]. In addition, Greenfield and Morgan argue that prior to engaging a contractor it is necessary to be certain about contractor's competence and ability to carry out work safely. This is a clear indication that safety must be made part of evaluation process [42].

Process monitoring

The urgency of having a monitoring system in place for construction projects especially the road construction infrastructural project is to ensure quality in terms of performance. Monitoring is also necessary to improve on knowledge transfer and learning for future projects. Onatere, Nwagboso and Georgakis define monitoring as, " [a] stage [that] entails the data gathering to ascertain progress according to targets [43]. Formal reporting of proof facilitates the matching of expenditure and outputs to measure successful delivery and the meeting of milestones. According to Quiroz, a properly maintained paved road ought to stay for a period of 10 to 15 years preceding a resurface, even though inadequate maintenance can lead to deterioration within 5 years [44].

Quiroz, therefore, proposed five steps to aid in conducting monitoring in quality manner, these include [44]: self-control framework by the contractor; interval inspections; both formal and informal inspections by supervisors and project managers; as well as the maintenance of a record book to trail the road users' comments or compliments. By so doing, maintenance work quality can be assured. Further, Quiroz emphasizes that in order to realize the desired outcome of projects, sufficient systems, processes and procedures guided by enabling laws, alongside proper enforcement and monitoring need to be put in place. Other scholars affirm that process monitoring should be regularly done through gathering and processing of vital project information to make sense on how the project is being run or implemented [45,46]. In view of International Federation of Red Cross (IFRC), process monitoring involves tracking activities and it works in tandem with compliance monitoring [47]:

"Process (activity) monitoring tracks the use of inputs and resources, the progress of activities and the delivery of outputs. It examines how activities are delivered – the efficiency in time and resources…. It is often conducted in conjunction with compliance monitoring, [whereby it] ensures compliance with donor regulations and expected results, grant and contract requirements, local governmental regulations and laws, and ethical standards…." [47]

Evaluation of a program entails measuring the process, the needs, inputs and outcomes [48]. Program or project process monitoring involves methodical and incessant documentation of key program's or project's aspects. According to Rossi, Lipsey and Freeman, these key aspects assess whether program is performing according to appropriate standards or as intended [49].

There are indicators to whether a program is performing well or not and this is measured through a methodical and incessant monitoring of certain process' aspects related to a program. This allows for continuous assessment that gives way for frequent feedback on program's performance, which is requisite in facilitating effective management of the program. From management point of view, process monitoring aims to find out how the program is being implemented and also putting in place corrective actions or measures where it is deemed necessary. This is important at the piloting stage of the program because it offers an opportunity to deal with unexpected problems. This kind of monitoring can also be done in ongoing programs or projects such as road construction projects to get information about its performance, and to determine if the target population benefits from the project or not [49].

Hassan opines that Monitoring and Evaluation (M&E) should be considered as a determinant in successful completion of the roads [50]. He goes further to state that Monitoring has a critical role in minimization and prevention of time and cost overruns hence required quality standards are attained during project implementation. Kamau and Mohamed on the other hand point out that M&E present a control action to reduce the variances from the set standards [51]. Project monitoring has been defined as the continuous appraisal of project execution process in accordance to the pre-set schedules, including the application of infrastructure, services, and inputs by beneficiaries of projects. Hence, both contractors and clients view quality as a critical component in construction works. Mwangu and Iravo determined that project monitoring had a positive correlation to project performance [52].

In view of Ngosong, these manifestation by the International Federation of Consulting Engineers (FIDIC), include mediocre or non-resilient workmanship, as well as unsafe structures, deferments, cost overruns and construction contract disputes [53]. Ngosong asserts that the quality and worth of construction are of significant attention to public as well as private sector clientele alike. Beltran, Mozingo and Harcourt suggest that regular meetings are essential to ensure contractor performance is satisfactory and that project specifications are being met; moreover, the authority of monitoring staff who control contractor performance also needs to be clarified and understood by contractors [54]. Generally, the public sector as a responsibility of delivering almost all public goods and services at all levels. Nsasira, Basheka and Oluka posit that an appropriate process of managing and monitoring contracts assists in the improvement of quality of commodities and causes a reduction in the cost of procurement, hence leading to achievement of three general goals, namely: product and service quality; on-time delivery; as well as budgetary effectiveness [55].

Davison and Sebastian determined the probability of contract issues for a certain category of contract; and of which is likely to face the challenges the most [56]. For instance, for construction contracts, order alteration, stays, and cost statistically bear similar chance of prevalence and significantly more probable as compared to the other categories, and that construction contracts are more susceptible to problems than other forms of contract. Salapatas concluded that performance of project could be measured using a system for monitoring and major indicators; as is the case with all systems, a project monitoring ought to start with commitment from the management [57]. The original methodologies for contracting are more susceptible to corruption due to the environment surrounding the processes of decision. The study by Ojok and Basheka concluded that M&E facilitated management decision-making, accountability, learning and growth as well as better governance standards [58]. According to the study M&E ought to not only be associated with nominal compliance but also foster decision-making that is anchored on evidence.

Process monitoring as part of M&E ought to be financed and institutionalized in order to intervene in the policy planning, implementation, and delivery of service. Hassan is of the view that M&E in the context of road project execution is key to the determination of the overall project success [50]. Accordingly, he developed a conjecture that improperly designed M&E framework relating to road construction projects could be part of the reasons for the pervasive delays in project completion and mediocre workman ships on such road projects, hence substandard road project performance.

Bulle and Makori in a study on the strategic planning influence on urban road projects' performance in the Kenyan context found that M&E influences performance [59]. Their study was descriptive and therefore it lacked statistical strength to show the relationship and strength of the independent and dependent variables. Byaruhanga and Basheka in a study on contractor monitoring and road infrastructure projects performance in Uganda found that contractor monitoring is a predictor of road infrastructure projects' performance [60]. Mwangu and Iravo

demonstrated that project supervisors and contractors make use of monitoring instruments in the operations of their project, hence generating satisfactory degree of success [52]. Umugwaneza and Kule evaluated the role of the combined M&E processes in terms of accountability (r=0.347, p<0.01), effective communication (r=0.466, p<0.01), partnership for planning (r=0.506, p<0.01) and supportive supervision (r=0.612, p<0.01) and concluded that significantly they correlate with sustainability of projects [61]. Minyiri and Muchelule also found that the organization would be able to practice monitoring intensity so as to enhance performance in procurement and further recommended that contractors should be allocated with the right amount of resources for project completion [20].

Ng'etich and Otieno pointed out that the fast worsening state of roads in Kenya calls for more M&E processes during road construction [17]. Asinza, et.al investigated the effect of monitoring and financial capacity on quality of projects [19]. The overall regression model gave the R squared (R2) of 0.354. This is to mean that 35.4% of variations in project quality can be associated with financial capacity and monitoring. Wanjala, et.al observed that over the years, there has been a challenge in monitoring practices implementation which have led to many organizations crumble as a result of failing to mastering the monitoring best practices in respect to performance of their own projects [18]. The results of the study showed that monitoring techniques had significant influence on the project performance (techniques (β= 0.674, p<0.05). The study however emphasized on the importance of monitoring but failed to show how monitoring particularly influences performance in road construction projects, hence the need for the current study.

Theoretical framework

The study was guided by Resource Based theory. Wambugu, Kyalo, Mbii and Nyonje states that a theoretical framework attempts to give an explanation of a phenomenon descriptively thereby specifying the relationship between variables together with the laws governing them.

Resource based theory

According Rugman and Verbeke, the Resource based theory was founded by Penrose in 1959 and originally captured in her book entitled "The Theory of the Growth of the Firm." [64]. The theory has gained popularity as demosntrated by wide application by array of scholars in the strategy thematic area. Rugman and Verbeke note that the theory availed the intellectual underpinning for the modern, resource-based view of an organization. Others such as Theriou, Aggelidis and Theriou examined the conflation between two dominant views of the concern, namely: Resource-Based View (RBV) as well as the Knowledge-Based View (KBV), by analyzing the comparative effect of concern-specific assets as well as knowledge endowments on the competitive advantage of the organization [65].

An integrated framework was suggested elaborating on the causal effect of both views on the competitive advantage of a concern. Müller & Jugdev point out that when considering project success the words of Isaac Newton that "If I have seen a little further it is by standing on the shoulders of Giants,." should not erode our minds [66]. Theriou, Aggelidis and Theriou assert that knowledge capacity effects, overt and covert, affecting the performance of a concern in the same manner as the unique assets of such a concern would, as well as 'knowledge complementarity or its dynamism' subtle effects on a concern's unique assets as well as abilities, leading to the betterment of prevailing or novel marketing, organizational, as well as technical abilities [65]. Theriou and colleagues therefore coined the term 'dynamic knowledge capabilities', a conflation that is imperative due to its emphasis on the significance sustainable competitive advantage [65]. Penrose's theory is considered to have key lessons in management practice and as such, has become a canonical reference resource, capabilities, and knowledge-based theory literature [67].

The resource based view shifted attention from a market perspective to a firm perspective when trying to explain differences in firm performance. From the start, with Edith Penrose and The Growth of the Firm in 1959, an ongoing process of development lasted over 20 years until the idea of inter-firm differences in resources as a factor explaining firm success was presented [68]. This theory was further popularized by Barney who viewed a firm as sum of physical capital resources, human capital resources and organizations [69].

Resource base theory therefore beliefs that firms that can properly mix its resources and capabilities stand a better chance to gain competitive advantage over other firms. However, Hijzen, Gorg and Hine warn the negative impact of international outsourcing on the demand for unskilled labour [70]. A similar article by Jaafar, Rashid and Aziz that focused on the same theory articulated factors antecedent to the SMCEs' performance in the Malaysian context; it was observed that the ability of the theory to explain the usefulness of a firm's resources in developing superior performance, is actually its key strength [71].

Through inferential statistics, the study proposed that SMCEs ought to place more emphasis on managerial capacity about financial, project, and marketing as well as supplier relationships to foster superior performance of a concern [71]. Nevertheless, given the industry uniqueness, the study also established that the characteristics of the owner are insignificant in light of performance of an enterprise. The study results availed evidence to the effect that a firm's survival is a function of its key resources, including, appropriate managerial abilities to develop strategies for sustainable industry competitive advantage. Hence, the theory stood out to support the following the variables used in this study to measure performance of road construction infrastructural projects in Nairobi County, Kenya.

Conceptual framework

The conceptual framework adopted in this study presents the relationship between the independent and dependent variables. Thus, the independent variable was contractors' capacity whereas the dependent variable is performance of road construction infrastructural projects, and the moderating variable is process monitoring. Figure 1 illustrates this relationship in detail.

Figure 1 shows the relationship between contractors' capacity evaluation in tender award (independent variable), process monitoring (moderating variable) and performance of road construction infrastructural projects (dependent variable). The concept of contractors' capacity evaluation in tender award is explained by these indicators: financial ability of contractors, technical ability of contractors, management ability of contractors and contractors' safety record. The indicators for moderating variable, process monitoring, are compliance with construction specification,, compliance with regulatory bodies' requirements, compliance with county by-laws, resolution to complaints management, adherence to allocation and utilization of resources for accomplishment of project's objectives. The moderating influence on contractors' capacity evaluation in tender award is hoped to lead to performance of road construction infrastructural projects in the following ways: Quality of completed road in terms of condition of drainage and water table, absence of potholes; Mobility and speed – delays, congestion, average speed; Comfort and convenience in terms of smoothness and roughness of the road; Road User benefits in terms of cost reduction, travel time reduction, vehicle operating cost reduction; and, Safety - properly constructed footbridges, pedestrian walkways, cycling lanes, road properly marked, adequate road signs, bus stops.

Research Methodology

The study was embodied a pragmatic mixed method approach by employing descriptive survey research design and correlational design [72,73]. The target population comprised of road contractors and public service drivers totaling to 460 from which we got a sample of 210 using Krejcie and Morgan table. The drivers sampled are plying Outering Road and Eastern Bypass Road in Nairobi County, Kenya. A pilot study was conducted in a nearby Kiambu County which has same characteristics as those participants in Nairobi County to avoid biasness. This was aimed at improving on the validity and reliability [74,75]. Content validity and construct validity was preferred in this study. Reliability was tested using Cronbach's Alpha reliability coefficient which was above 0.6 as indicated by Kothari [76]. Descriptive data was presented in frequencies, percentages, means and standard deviation. Gakuu, Kidombo and Keiyoro consider the means and the standard deviations are ideal for setting up interval data [77]. Inferential statistics was performed to

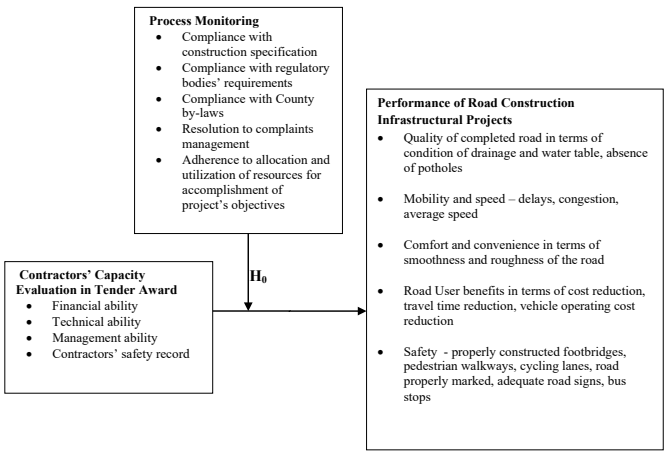

Figure 1. Conceptual Framework of the Moderating Influence of Process Monitoring on the Relationship between Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects.

find out how the predictor correlated with the outcome. First of all, multivariate analysis was conducted to find of out the strength of the combined factors under contractors' capacity evaluation in tender award, then followed by hierarchical regression whereby the moderator, process monitoring was introduced. Qualitative data gathered was analyzed thematically. To be able to perform further statistical tests such as t-tests, linear regression and even analysis of variance, it important to have a normally distributed data [77]. In view of Bierman, Bonini and Hausman and when W statistic (Shapiro Wilk) is closer or equals to the value of 1 then the data being used is deemed normal [78]. This was done and presented in Table 1. Questionnaires were distributed to the road contractor whereas the interview schedules were given to the Public Service Vehicles (PSVs) drivers, also referred to as matatu drivers. Stratified sampling was used to categorize the respondents as per their group sizes [79]. This was followed by proportionate sampling so as to get exact sample size in each strata and finally simple random used to pick individual respondents in the study. Since the population in each strata was above 30, census was not preferred [80]. Ethical issues were observed by obtaining a letter of authority from the government of Kenya through National Commission for Science, Technology and Innovation (NACOSTI) (Table 1).

It is evident that the values of W-Statistic for all the variables under the study range between 0.923 and 0.985 implying that the data was normally distributed (Table 1). This is because all values were near to one [78].

Results and Discussion

This section presents the findings and discussion on respondents' background information, the descriptive analysis, the correlation and inferential statistics.

Questionnaire return rate

Questionnaire returned were recorded in Table 2.

Results show that questionnaires were administered to 210 respondents, comprising 106 contractors and 104 PSV matatu drivers (Table 2). Out of these, 153 were filled and returned, representing questionnaire return rate of 72.8%. Enshassi, Mohamed and Abushaban recorded a response rate of 73% whereas recorded 73.3% [81,82]. The response rate of 72.8% in the current study, therefore, met the criteria set by both Saunders, Lewis and Thornhill of 50% and Mugenda and Mugenda of 70% [83,84]. This was enough to carry out inferential analyses.

Demographic information of the respondents

Background information about the respondents was gathered in terms of gender, age, level of education and experience.

Contractors' demographic information

This section presents demographic profiles for both contractors (Table 3).

The contractors' demographics (Table 3) revealed that majority were male contractors followed by female counterparts represented by 62 (75.6%) and 20 (24.4%) respectively. This could be engineering is a male dominated course and career. In terms of age, the results demonstrates that road construction is mainly run by mature citizens. The fewer number of youth in the industry could be due to lack of capacity, for example, financial, management, technical and poor safety record, to undertake large scale projects. Majority of the contractors 73 (89.0%) are well educated and capable providing good road infrastructure. In respect to status of the contractors in construction firms, 15 (18.3%) were managing directors, 22 (26.8%) directors, 13 (15.9%) managers, 20 (24.4%) senior staff and 12 (14.6%) supervisors. The study showed that most contractors possess minimum 6 years of work experience to over 21 years. It was found that most construction firms' have operated for over 11 years compared to firms that have operated 6-10 years (2.4%). The findings shows that majority of contractors 60 (73.2%) had participated in construction of national roads while the remaining 22 (26.8%) have experience in constructing international roads. Hence, a good number of contractors have a better idea of what is ailing performance of roads locally.

PSVs divers' demographic information

This section presents demographic information of the respondents, specifically drivers plying Outer ring road and Eastern Bypass (Table 4).

Demographically in Table 4 majority of the drivers were males 69 (97.2%) followed by 2 (2.8%) representing the female counterparts. Age-wise, all contractors have met the age requirement as stipulated by the law whereby it was found that 70.4% were above 31 years while the rest 21 (29.6%) were between 21 and 30. The study revealed that majority of drivers possess some form of tertiary education whereby, 34 (47.9%) had college certificates, 25 (35.2%) college diplomas, 3 (4.2%) Bachelor's degree and only a few of the drivers nine (12.7%) had sat for KCSE. Moreover, contractors had over 6 years of work experience in public service transport hence all could provide quality responses to the questionnaire due to vast experience on how they perceive road performance. Table 4 also shows that many of Public service vehicles (PSVs) have been driven for a longer period of time which could help us learn more about their performance as a result of the roads they are driven on in terms of depreciation and user costs generally. Finally 40 (56.3%) of PSV drivers indicated that they use Outer ring road, while the rest 31 (43.7%) ply Eastern Bypass road. This implies that a good number of matatu drivers would share their opinion on the performance of these two roads that were recently constructed.

Performance of road construction infrastructural projects

The study found it necessary to ascertain repondents' opinions on performance of roads. Perceptions of respondents on each of the following dimensions of performance of road construction infrastructural projects: quality of completed road in terms of condition of drainage and water table; mobility and speed – delays, congestion, average travel speed; comfort/convenience in terms of smoothness and roughness of the road; road user benefits in terms of cost reduction, travel time reduction, vehicle operating cost reduction; and road safety were each measured within the scale. The Likert scale ranged from 5-Strongly Agree (SA), 4-Agree (A), 3-Neutral (N), 2-Disagree (D), and 1-Strongly Disagree (SD). The results are in Table 5.

From Table 5, the means of 21 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

Statement one, road is built with a functional drainage systems to provide long-term

Table 1. Results of Kolmogorov Smirnov and Shapiro Wilk Tests

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Performance of Road Construction Infrastructural Projects	0.134	153	0.000	0.964	153	0.001
Financial Ability of Contractors	0.113	153	0.000	0.960	153	0.000
Technical Ability of Contractors	0.146	153	0.000	0.923	153	0.000
Management Ability of Contractors	0.186	153	0.000	0.924	153	0.000
Contractors' Safety Record	0.087	153	0.006	0.985	153	0.104
Process Monitoring	0.171	153	0.000	0.957	153	0.000

[a] Lilliefors Significance Correction

Table 2. Questionnaire Return Rate

Category of Respondents	Sample Size	Returned	Average Return Rate (%)
Contractors	106	82	77.36
PSVs Drivers	104	71	68.27
Total	210	153	72.815

Table 3. Contractors' Demographic Profile

Categories of Demographics	Values	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	62	75.6	75.6	75.6
	Female	20	24.4	24.4	100.0
	Total	82	100	100	
Age	21-30 years	6	7.3	7.3	7.3
	31-40 years	19	23.2	23.2	30.5
	41-50 years	25	30.5	30.5	61.0
	51-60 years	22	26.8	26.8	87.8
	61 and above years	10	12.2	12.2	100
	Total	82	100	100	
Highest Level of Education	College Diploma	9	11.0	11.0	11.0
	Bachelor's Degree	46	56.1	56.1	67.1
	Master's Degree	27	32.9	32.9	100
	Total	82	100	100	
Status in Organization	Managing Director	15	18.3	18.3	18.3
	Director	22	26.8	26.8	45.1
	Manager	13	15.9	15.9	61.0
	Senior Staff	20	24.4	24.4	85.4
	Supervisor	12	14.6	14.6	100.0
	Total	82	100	100	
Work Experience of Contractors	6-10 years	20	24.4	24.4	24.4
	11-15 years	17	20.7	20.7	45.1
	16-20 years	11	13.4	13.4	58.5
	21 and above Years	34	41.5	41.5	100
	Total	82	100	100	
Years of Operation in Road Construction	6-10 years	2	2.4	2.4	2.4
	11-15 years	18	22.0	22.0	24.4
	16-20 years	15	18.3	18.3	42.7
	21 and above Years	47	57.3	57.3	100
	Total	82	100	100	
Category of Road Involved in Construction	National	60	73.2	73.2	73.2
	International	22	26.8	26.8	100.0
	Total	82	100	100	

Table 4. PSV Drivers' Demographic Profile

Categories of Demographics	Values	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	69	97.2	97.2	97.2
	Female	2	2.8	2.8	100.0
	Total	71	100	100	
Age	21-30 years	21	29.6	29.6	29.6
	31-40 years	20	28.2	28.2	57.7
	41-50 years	19	26.8	26.8	84.5
	51-60 years	5	7.0	7.0	91.5
	61 and above years	6	8.5	8.5	100
	Total	71	100	100	

Categories of Demographics	Values	Frequency	Percent	Valid Percent	Cumulative Percent
Highest Level of Education	KCSE	9	12.7	12.7	12.7
	College Certificate	34	47.9	47.9	60.6
	College Diploma	25	35.2	35.2	95.8
	Bachelor's Degree	3	4.2	4.2	100
	Total	71	100	100	
Status in Organization	Driver	49	69.0	69.0	69.0
	Driver/Conductor	22	31.0	31.0	100.0
	Total	71	100	100	
Work Experience of Drivers	6-10 years	20	24.4	24.4	24.4
	11-15 years	17	20.7	20.7	45.1
	16-20 years	11	13.4	13.4	58.5
	21 and above Years	34	41.5	41.5	100
	Total	71	100	100	
PSV Years of Opetration in Transport Industry	5 and below years	5	7.0	7.0	7.0
	6-10 years	28	39.4	39.4	46.5
	11-15 years	8	11.3	11.3	57.7
	16-20 years	11	15.5	15.5	73.2
	21 and above Years	34	26.8	26.8	100
	Total	71	100	100	
Name of the Road PSV Plying	Outer Ring	40	56.3	56.3	56.3
	Eastern Bypass	31	43.7	43.7	100.0
	Total	71	100	100	

Table 5. Performance of Road Construction Infrastructural Projects

No	Statements	5(SA) F (%)	4(A) F (%)	3(N) F (%)	(2)D F (%)	(1)SD F (%)	Mean	SDV
	(a) Quality of Completed Road in terms of condition of drainage and water table							
1.	The road is built with a functional drainage systems to provide long-term road performance	23 (15.0%)	32 (20.9%)	44 (28.8%)	24 (15.7%)	30 (19.6%)	2.96	1.327
2.	The road is well constructed with water table that does not permit flooding	0 (0.0%)	16 (10.5%)	47 (30.7%)	61 (39.9%)	29 (18.9%)	2.33	0.902
3.	Road constructed with adequate drainage systems depends entirely on contractor capacity to do the job	35 (22.9%)	44 (28.8%)	43 (28.1%)	30 (19.6%)	1 (0.6%)	3.54	0.070
4.	Drainage system is operative and allows passage of residual	5 (3.2%)	28 (18.3%)	27 (17.7%)	60 (39.2%)	33 (21.6%)	2.42	1.116
5.	Proper workmanship is evidenced by lack of potholes	42 (27.5%)	75 (49.0%)	33 (21.6%)	3 (1.9%)	0 (.0%)	4.02	0.756
	(b) Mobility and Speed – delays, congestion, average travel speed							
6.	Congestion has significantly reduced	30 (19.6%)	117 (76.5%)	6 (3.9%)	0 (.0%)	0 (.0%)	4.16	0.460

No	Statements	5(SA) F (%)	4(A) F (%)	3(N) F (%)	(2)D F (%)	(1)SD F (%)	Mean	SDV
7.	Delays are reduced	25 (16.3%)	115 (75.2%)	13 (8.5%)	0 (.0%)	0 (.0%)	4.08	0.494
8.	Average travel speed has generally improved	58 (37.9%)	74 (48.4%)	21 (13.7%)	0 (.0%)	0 (.0%)	4.24	0.679
	(c) Comfort/Convenience in terms of smoothness and roughness of the road							
9.	The texture of the road is good	67 (43.8%)	55 (35.9%)	30 (19.6%)	0 (.0%)	1 (0.7%)	4.22	0.805
10.	The skid resistance of the road surface is good	45 (29.4%)	64 (41.8%)	33 (21.6%)	10 (6.5%)	1 (0.7%)	3.93	0.911
11.	Flooding of the road is not experienced during heavy downpours (rainy season)	6 (3.9%)	3 (2.0%)	36 (23.5%)	51 (33.3%)	57 (37.3%)	2.09	1.023
	(d) Road User benefits in terms of cost reduction, travel time reduction, vehicle operating cost reduction							
12.	The vehicles take longer to depreciate	12 (7.8%)	84 (54.9%)	34 (22.2%)	3 (2.0%)	20 (13.1%)	3.42	1.110
13.	The vehicle breakdowns on the roads has reduced due to good road constructed	24 (15.7%)	85 (55.6%)	44 (28.7%)	0 (.0%)	0 (.0%)	3.87	0.656
14.	Due to properly constructed road the road user costs has tremendously reduced	18 (11.8%)	83 (54.2%)	16 (10.5%)	15 (9.8%)	21 (13.7%)	3.41	1.227
	(e) Road Safety							
15.	Reported cases of accidents have reduced	38 (24.8%)	72 (47.1%)	28 (18.3%)	2 (1.3%)	13 (8.5%)	3.78	1.100
16.	Roads are having enough signage	9 (5.9%)	81 (52.9%)	45 (29.4%)	15 (9.8%)	3 (2.0%)	3.51	0.828
17.	Bumps are provided in the designated places	14 (9.1%)	55 (35.9%)	24 (15.7%)	57 (37.3%)	3 (2.0%)	3.13	1.080
18.	Road users do know the meaning of most of the signage language	54 (35.3%)	70 (45.8%)	28 (18.3%)	0 (.0%)	1 (0.6%)	4.15	0.759
19.	Pedestrians' walkways adequately provided	16 (10.5%)	43 (28.0%)	34 (22.2%)	44 (28.8%)	16 (10.5%)	2.99	1.189
20.	Footbridges are sufficiently provided	8 (5.2%)	0 (0.0%)	32 (20.9%)	54 (35.3%)	59 (38.6%)	2.05	1.035
21.	Bus stops are well and placed in the right designated areas	8 (5.2%)	18 (11.7%)	15 (9.8%)	70 (45.8%)	42 (27.5%)	2.22	1.129
	Composite mean and standard deviation						3.36	0.297

road performance, out of 153 respondents, 23 (15.0%) strongly agreed, 32 (20.9%) agreed, 30 (19.6%) strong disagreed, 24 (15.7%) and 44 (28.8%) stated a neutral opinion. Arising from this line item was a mean of 2.96 against a composite mean of 3.36. This implies the drainage system is not properly functioning. A higher standard deviation of 1.327 against a composite standard deviation of 0.297 indicated that this item elicited inconsistency in terms of responses received. Therefore, factors inhibiting functional drainage systems, besides technical aspects, need thorough check-up and a solution provided to enhance road performance.

Statement two, the road is constructed with water table that does not permit flooding, out of 153 respondents, 16 (10.5%) were in agreement with the statement, 29 (18.9%) strongly disagreed, 61 (39.9%) disagreed, followed by those with neutral opinions 47 (30.7%). A mean of 2.33 obtained was below the composite mean of 3.36 which refuted the claim that water table is well constructed. With a standard deviation 0.902 against 0.297 the composite standard deviation, the opinions received were divergent among the respondents. It is therefore important for the road construction engineers to pay keen attention to water table in terms of design specifications to avoid flooding during heavy downpours.

Statement three, road constructed with adequate drainage systems would depend entirely on contractors' capacity to do the construction job. Out of 153 respondents, 35 (22.9%) strongly agreed, 31 (20.3%), 44 (28.8%) agreed, 1 (0.6%) strongly disagreed, 30 (19.6%) disagreed and 43 (28.1%) shared a neutral opinion. The statement had a mean of 3.54, slightly higher than the composite mean of 3.36 indicating that contractors with capacity are capable of constructing adequate drainage systems. There was consistency in responses based on the lower standard deviation of 0.070 compared to the composite standard deviation of 0.297.

Statement four, drainage systems is operative and allows passage of residual. Out of 153 respondents, 5 (3.2%) strongly agreed, 28 (18.3%) agreed, 33 (21.6%) strongly disagreed, 60 (39.2%) disagreed. This demonstrates that majority of respondents were in disagreement with the statement. The rest of respondnets 27 (17.7%) chose to remain neutral. With a mean of 2.42 below the composite mean of 3.36, this suggested that the drainage systems does not allow passage of residual. Emerging from this statement was also a standard deviation of 1.116 higher than the composite standard deviation of 0.297 which proved that opinions were inconsistent. This could be because of lack regular maintenance or contractors not being able to adhere to design specifications during construction. Moreso, monitoring of human activities such as excessive littering is necessary to avoid blockage of the drainage systems.

Statement five, proper workmanship is evidenced by lack of potholes. Out of 153 respondents, 42 (27.5%) strongly agreed, 75 (49.0%) agreed, 3 (1.9%) disagreed and 33 (21.6%) remained neutral. A highest mean of 4.02 recorded compared to the composite mean of 3.36 implied that good workmanship by the contractors would definitely result to quality outputs or roads that are well performing. A higher standard deviation of 0.756 on this statement compared to the composite standard deviation of 0.297 indicated inconsistency in respondents' opinions.

Statement six, congestion has significantly reduced. Out of 153 respondents, 30 (19.6%) strongly agreed, 117 (76.5%) agreed. There were zero responses in terms of those who disagreed with the statement and only 6 (3.9%) remained neutral. A line item mean of 4.16 recorded was higher than the composite mean of 3.36 hence supporting the views that indeed congestion had ceased. This implies that road performance had so far been enhanced and this could be as a result of expansion and upgrading of the status of the road. A higher standard deviationof 0.460 compared to the composite of 0.297 indicated divergence in opinions.

Statement seven, delays are reduced. Out of 153 respondents, 25 (16.3%) strongly agreed with the statement, while 115 (75.2%) agreed. None disagreed and 13 (8.5%) remained neutral. Derived from this statement was a higher mean of 4.08 compared to the composite mean of 3.36 and a higher standard deviation of 0.494 compared to 0.297 the composite standard deviation. This implied that road performance in terms of reduced delays had positively improved.

Statement eight, average travel speed has generally improved. Out of 153 respondents, 58 (37.9%) strongly agreed, 74 (48.4%) agreed. Meanwhile, none of the respondent disagreed although only a few 21 (13.7%) gave a neutral opinion. With a mean of 4.24 higher that the composite mean of 3.36, and a standard deviation of 0.679 higher than the composite standard deviation oof 0.297, the results suggests that the opinions were convergent and that average speed had significantly improved. This could be due to construction of a dual carriage for a road like Outer-Ring.

Statement nine, texture of the road is good. Out of 153 respondents, 67 (43.8%) strongly agreed, 55 (35.9%) agreed, 1 (0.7%) strongly disagreed and 30 (19.6%) expressed a contrary neutral opinion. A mean of 4.22 higher than the composite mean of 3.36 suggested that road texture had been improved. The standard deviation of 0.805 obtained was higher than the composite standard deviation of 0.297 indicating respondents' opinions were divergent.

Statement ten, the skid resistance of the road surface is good. Out of 153 respondents, 45 (29.4%) strongly agreed, 64 (41.8%) agreed, 1 (0.7%) strongly disagreed, 10 (6.5%) disagreed and 33 (21.6%) neutral. Based on these responses a corresponding line item mean of 3.93 higher than the composite mean of 3.36 indicated that skid resistance was good. Emerging from this statement was a standard of 0.911 higher than composite standard deviation of 0.297 that showed opinions were divergent.

Statement eleven, flooding of the road is not experienced during heavy downpours (rainy season). Out of 153 respondents, 6 (3.9%) strongly agreed, 3 (2.0%) agreed, 57 (37.3%) strongly disagreed, 51 (33.3%) disagreed whilst 36 (23.5%) chose to remain neutral on this statement. A line mean of 2.09 recorded was lower than 3.36 which indicated that motorists experienced flooding during heavy rainy seasons on the roads. This could be due to some reasons already highlighted such as littering by the public or citizens, narrow or fewer drainage systems and improper water table. These issues need to be sorted out at the beginning of road construction to avoid affecting the overall performance of the roads. This statement attracted a standard deviation of 0.911 higher than 0.297 the composite standard deviation hence this implied a lot of inconsistencies in responses.

Statement twelve, vehicles take longer time to depreciate. Out of 153 respondents, 12 (7.8%) strongly agreed, 84 (54.9%) agreed with the statement, 20 (13.1%) strongly disagreed, 3 (2.0%) disagreed and 34 (22.2%) remained neutral. The mean was 3.42 higher than 3.36 the composite mean. This therefore implied that the matatu drivers were deriving maximum benefits because their vehicles were taking longer time to depreciate, a sign of road performance. The respondents' views were diverse given the standard deviation was 1.110 above the composite standard deviation of 0.297.

Statement thirteen, the vehicle breakdowns on the roads has reduced due to good road constructed. Out of 153 respondents, 24 (15.7%) strongly agreed, 85 (55.6%) agreed, none disagreed and the rest 44 (28.7%) remained neutral. A higher mean of 3.87 compared to composite mean of 3.36 was obtained. This therefore implies that road performance has significantly improved due to reduced vehicle breakdowns as this was not the case in the past. The standard deviation of 0.656 above composite standard deviation of 0.297 indicated opinions lied in one direction or remained consistent.

Statement fourteen, due to properly constructed road user costs has tremendously reduced. Out of 153 respondents, 18 (11.8%) strongly agreed, 83 (54.2%) agreed, 21 (13.7%) strongly disagreed, 15 (9.8%) disagreed, while the rest 36 (23.5%) had a neutral opinion. A mean of 3.41 was obtained higher than the composite mean of 3.36 which suggested that indeed a road user costs have reduced. A standard deviation of 1.227 on the statement was higher than the composite standard deviation of 0.297 which clearly indicated that the respondents openly gave diverse views.

Statement fifteen, reported cases of accidents have reduced. Out of 153 respondents, 38 (24.8%) strongly agreed, 72 (47.1%) agreed, 13 (8.5%) strongly disagreed, 2 (1.3%) disagreed and 34 (22.2%) were neutral. A corresponding higher mean of 3.78 derived from this statement against a composite mean of 3.36 explains that cases of road accidents on both roads, Eastern ByPass and Outerring have significantly reduced. Inconsistency in opinions was evident by a higher standard deviation of 1.100 compared to a composite standard deviation of 0.297. Although accidents have reduced, there could still be a few cases that need public awareness and campaigns to ensure road safety is observed by both the motorists and the contractors during construction.

Statement sixteen, roads are having enough signage. Out of 153 respondents, 9 (5.9%) strongly agreed, 81 (52.9%) agreed, 3 (2.0%) strongly disagreed, 15 (9.8%) disagreed and 45 (29.4%) gave a neutral opinion. Analysis revealed a higher mean of 3.51 on this line item compared to a composite mean of of 3.36 implied that the roads had enough signage. The opinions shared by the respondents also showed that there was inconsistency in reporting given a higher standard deviation of 0.828 and compoisite standard deviation of 0.297. Indeed, provision of road safety signage is vital to eradicate some of the road carnages we witness on some of the roads. Subsequently, there should be no road commissioned prior to ensuring it is well marked and sufficient signage are provided for both the motorists and pedestrians.

Statement seventeen, bumbs are provided in the designated places. Out of 153 respondents, 14 (9.1%) strongly agreed with the statement, 55 (35.9%) agreed, 3 (2.0%) strongly disagreed, 57 (37.3%) disagreed and 24 (15.7%) were neutral. This statement yielded a slightly lower mean of 3.13 compared to the composite mean of 3.36. With a standard deviation of 1.080 compared to the composite standard deviation of 0.297, the views of the respondents were inconsistent. Generally, based on this opinions, the study discovered that bumps are not constructed in the right areas on the roads.

Statement eighteen, road users do know the meaning of most signage language. Out of 153 respondents, 54 (35.3%) strongly agreed, 70 (45.8%) agreed, 1 (0.6%) strongly disagreed and 28 (18.3%) remained neural. Arising from this statement was a corresponding mean 4.15 higher than the composite mean 3.36 and a higher standard deviation 0.759 compared to the composite of 0.297. This implied despite most the road users knowing the meaning of road signs, there could still be ignorance and breaking of traffic rules or laws and lack of commitment to enforce the laws that would see improvement in road performance either by Nairobi county or NCA or KeNHA.

Statement nineteen, pedestrians' walkways are adequately provided. Out of 153 respondents, 16 (10.5%) strongly agreed, 43 (28.0%) agreed, 16 (10.5%) strongly disagreed, 44 (28.8%) disagreed and 34 (22.2%) were neutral. The line item mean of 2.99 was below the composite mean of 3.36. Based on this analysis, it was clear that pedestrians' walkaways were insufficient and impacted negatively on road performance. In respect to the standard deviations, the opinions were convergent. Therefore, it is highly advisable for the contractors to ensure pedestrians walkways are constructed to promote safety, hence road performance. The line standard deviation was 1.189 above 0.297 the composite standard deviation indicating divergence of opinions.

Statement twenty, footbridges are sufficiently provided. Out of 153 respondents, 8 (5.2%) strongly agreed that the foot bridges were adequate, 59 (38.6%) strongly disagreed, 54 (35.3%) disagreed and 32 (20.9%) were of neutral opinion. A lower mean of 2.05 compared to composite mean of 3.36 obtained. This implied that pedestrians were not provided with adequate footbridges a factor that would be attributed to the accidents occurring on both Eastern ByPass and Outerring roads. To improve this aspect of road safety, it is imperative that the government agencies in charge of road construction sector put in place measures that would oversee that footbridges are mandatory where highways pass. A standard deviation of 1.035 on this statement was higher compared to composite standard deviation of 0.297 signaling divergence of opinions.

Statement twenty, bus stops are well placed in the right designated areas. Out of 153 respondents, 8 (5.2%) strongly agreed, 18 (11.7%) agreed, 42 (27.5%) strongly disagreed, 15 (9.8%) remained neutral. With a much lower line mean of 2.22 compared to a composite of mean of 3.36, implying that bus stops were not placed in the right areas. This is to mean that when bus stops are not in designated ares, this puts pressure on other motorists hence compromised road performance. Construction of roads in future should consider this aspect seriously if performance road had to be improved. Opinions on this statement were divergent given a higher a standard deviation of 1.129 compared to composite standard deviation of 0.297.

Results of interviews with road construction engineers indicated that there was concurrence among them about the state of 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:

"Rain is the main concern; we tend to do our best in terms of constructing better roads for our citizens but excessive rains sweep away the tarmac; a contractor is also limited by the variation of project design; one of the reasons why we experience poor performing roads it is because road projects are faced by public interference; inadequate drainage for storm water; disposal of waste water overburdens drains and un-hygienically recommended; poor Social life of road users mainly causing traffic congestion; there is need therefore to encourage public systems of transport than private vehicles (poor social lifestyle); encroachment by road hawkers, limit performance around road reserves; ignorance on the part of public service vehicle to fully observe road marks; large volumes of personal vehicles; a trend on over relying on personal vehicles exceeding traffic designed stream density resulting to snarl-ups or congestion hence poor road performance." Road Construction Engineers' Opinions 2018

Results of interviews with public service vehicles (PSVs) drivers indicated that there was concurrence among them about the state of 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:

"A day never ends without at least one accident happening; in some instances, when it rains heavily flooding occurs and this really stresses us as drivers because we cannot move our vehicles although this has quite improved compared to when the road was dilapidated; this outer ring road some good work was done however the road safety signs are lacking and hence some accidents happen; when there's heavy downpour of rain our vehicles get stuck and we count it as a loss to our businesses; the bus stops are not adequate and therefore we are forced to pick and drop passengers in the middle of the road which is not only dangerous to our clients but also to us; it is criminal offence to pick and drop passengers along the road but what do we do when the bus stops are not provided? We are sometimes forced to bribe police to allow us to pick passengers where clearly it is not designated for us to do so, especially around Allsops stage; there are no footbridges in common areas that would enable pedestrians or public cross the road. For example, at Mutindwa market, pedestrians are a cause of traffic congestion; corruption is eating our country because when a contractor is awarded tender is forced to share with the one who awards then the contractor is left with no other option other than construct a road that does not minimum quality requirements; I am just being assertive that our government systems have condoned corruption hence poor services including construction of quality roads; around Taj Mall coming down towards the quarry there is a drainage problem. Sometimes when it rains there is an overflow to the main road making it impassible for PSVs and even private vehicles; some parts along outer ring road have no service lanes and this imply that all vehicles must use the main road which cannot happen with us drivers of PSVs; bus stops are the main problem we are experiencing on our roads especially this Eastern by pass. The government should do something about this; we have witnessed recently the government coming in late to erect footbridges after the loss of innocent lives due to speeding vehicles; if I am asked, I would allow bumps constructed along the main road or the highway. It is not only dangerous but it encourages pedestrians to cross anywhere carelessly and this works against the mobility of vehicles; the challenge we keep on experiencing on daily basis is where to pick and drop our passengers, for there are no sufficient bus stops; you find that areas with bus stops are not even properly done; this is totally annoying; the road is good yes but it is sometimes a nightmare when you have to stop the vehicle to allow the pedestrians to cross the road in areas not even permitted; during rush hours we tend to experience heavy traffic jams; the congestion and delays experienced contribute high fuel costs because the vehicles take longer to reach their destinations like town." PSVs Drivers' Opinions 2018

Combined contractors' capacity evaluation and performance of road construction infrastructural projects

Financial ability, technical ability, management knowledge, and contractors' safety record combined, were referred to as contractor's capacity evaluation in tender award. The combined influence of these factors on performance of road construction infrastructural projects was tested using inferential statistics during moderation of process monitoring (Table 6).

The highest aggregate mean score, as shown in Table 6, was on the management ability dimension, with a score of 4.06; followed by financial ability, with mean score 3.79; technical ability, with mean score of 3.69; and contractors' safety record, with mean score of 3.38. The aggregate mean score for the dependent variable (Performance of Road Construction Infrastructural Projects) was 3.36. The most consistent scores were on the management ability, with the least standard deviation of 0.346. This indicates the variables influence performance of roads positively.

Results of interviews with road construction engineers indicated that the overall contractors' capacity evaluation in tender award influence to a great extent 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:

"The financial capacity, political, management and education background all these can lead to or slow down the performance of the road by misappropriation of the resources; can improve performance if proper evaluation is followed for example financial and capacity of contractor owned; corruption will still venture into the process in a competitive evaluation; in Kenya tribalism, nepotism and corruption have never allowed a properly designed system to function; unfortunately, construction and infrastructural industries are worth it; by ensuring all the key factors of contractor evaluation work together, this will inform delivery of quality roads and that this will also promote the name of those in construction industry. With no doubt it is important to note that good performance can be achieved in wholesome; this means that none of these factors can work independently to produce good results. Road construction that is expected to perform well should and must not leave out either financial, technical, safety and management aspects; I have seen in some instances where some contractors ignore the technical ability and end up hiring cheap labour; this is detrimental to the road performance in the future. Therefore, all these factors: technical, financial, management and safety of the contractor must be factored in during construction; combining all the factors will enhance quality in road construction hence good road performance; if contractors could be keen by observing all these factors (financial, safety, management and technical) there could be no complaints about road performance." Road Construction Engineers' Opinions

Results of interviews with public service vehicle (PSVs) drivers indicated that the overall contractors' capacity evaluation in tender award influenced to a great extent 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:

"The financial capacity, political, management and education background all these can lead to or slow down the performance of the road by misappropriation of the resources; I think if all factors held together there will be improvement in road construction project; performance will be enhanced; our roads will be safe in that the following will be there to measure performance: properly marked roads, adequate signs, well done bumps, foot bridges located in the right areas; there will be little deviations for example materials used will be of good quality and adequate enough to produce good roads; combining all aspects of contractors' capacity evaluation in tender award will mean our contractors are forced to do good job and ensure minimal mistakes are recorded; there will be a great improvement in our roads performance; quality roads will be produced; our roads will not have potholes; contractors will be focused on producing excellent roads with high performing rate; as it stands the potholes show up few years after completion of the road or even within the year in which a road is launched but if all the factors combined, then we are likely to see quality roads." PSVs Drivers' Opinions

Moderating influence of process monitoring on relationship between contractors' capacity and performance of road construction infrastructural projects

To assess the moderating influence of process monitoring on the relationship

Table 6. Combined Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects

Variable	n	Mean	Std. Deviation
Performance of Road Construction Infrastructural Projects	153	3.36	0.297
Financial Ability of Contractors	153	3.79	0.533
Technical Ability of Contractors	153	3.69	0.377
Management Ability of Contractors	153	4.06	0.346
Contractor's Safety Record	153	3.38	0.544

between contractors' capacity and road performance, the respondents were asked to, in a scale of 1-5, score various statements relating to specific indicators of process monitoring. The dimensions of process monitoring under which the indicators were drawn were: compliance with construction specification; compliance with regulatory bodies' requirements; compliance with County by-laws; resolution to complaints management; and, adherence to allocation and utilization of resources for accomplishment of project's objectives. The Likert scale ranged from 1-Strongly Disagree (SD), 2-Disagree (D), 3-Neutral (N), 4-Agree (A), and 5-Strongly Agree (SA). The results are shown in Table 7.

From Table 7, the means of 13 items used to generate data on process monitoring were summed up and used to compute the composite mean and standard deviation that resulted to 3.60 and 0.505 respectively.

Statement one, firms or contractors who comply with construction specification tend to produce highly quality roads whose performance meet road user satisfaction. Out of 153 respondents, 93 (60.8%) strongly agreed, 45 (29.4%) agreed and 15 (9.8%) gave neutral responses. The mean realized was 4.51, which was above the composite mean 3.60. With a higher standard deviation of 0.670 compared to composite mean of 0.505, the responses received were convergent. The overall results suggests that most contractors complying or following the stipulated construction specifications are bound to yield better results in terms of road performance. This is considered a positive thing to influence individual contractor's ethical behavior.

Statement two, contractors are keen on complying with road construction specifications. Out of 153 respondents, 17 (11.2%) strongly agreed, 53 (34.6%) agreed, 15 (9.8%) strongly disagreed, 15 (9.8%) disagreed and 53 (34.6%) gave undecided or neutral responses. The mean 3.27 was slightly lower than the composite mean of 3.60 whereas the standard deviation of 1.102 was above the composite or overall standard deviation of 0.505 suggesting that the respondents' opinions took a divergent direction. This implies that contractors are not keen on complying with given specifications as far as construction of road is concerned. By being keen, it could also mean that contractors should pay special attention to the right composition of materials before and during construction.

Statement three, construction specifications are met by most of the road construction contractors. Out of 153 respondents, 19 (12.4%) strongly agreed, 43 (28.1%) agreed, 17 (11.1%) strongly disagreed, 31 (20.3%) disagreed and 43 (28.1%) remained neutral. The mean based on this findings was 3.10 below the composite mean of 3.60. This implied that not all contractors are keen with their work hence they do not meet construction specifications. There is need, for instance, for the contractors to work with all trained personnel on the construction to avoid cases of deviation. This will also contribute to the life of the roads whereby roads will take time before they develop potholes and other defects. A standard deviation of 1.193 which was higher than the composite standard deviation of 0.505 proved that opinions were divergent.

Statement four, contractors who meet minimum requirement, try to make some improvements after completing their tasks. Out of 153 respondents, 7 (4.6%) strongly agreed, 41 (26.8%) agreed, 2 (1.2%) strongly disagreed, 44 (28.8%) disagreed and 59 (38.6%) were held neutral views on this statement. A much lower mean of 3.05 compared to 3.60 composite mean implied that contractors are not

Table 7. Moderating Influence of Process Monitoring on Relationship between Contractors' Capacity and Performance of Road Construction Infrastructural Projects

No.	Statement	5(SA) F (%)	4(A) F (%)	3(N) F (%)	2(D) F (%)	1(S)D F (%)	Mean	SDV
	(a) Compliance with construction specification							
1.	Firms/contractors who comply with construction specification to tend produce highly quality roads whose performance meet road user satisfaction	93 (60.8%)	45 (29.4%)	15 (9.8%)	0 (0.0%)	0 (0.0%)	4.51	0.670
2.	Contractors are keen on complying with road construction specifications	17 (11.2%)	53 (34.6%)	53 (34.6%)	15 (9.8%)	15 (9.8%)	3.27	1.102
3.	Construction specifications are met by most of the road construction contractors	19 (12.4%)	43 (28.1%)	43 (28.1%)	31 (20.3%)	17 (11.1%)	3.10	1.193
4.	Contractors who meet minimum requirement, try to make improvements after completing their tasks.	7 (4.6%)	41 (26.8%)	59 (38.6%)	44 (28.8%)	2 (1.2%)	3.05	0.891
	(b) Compliance with regulatory bodies' requirements							
5.	Construction regulatory bodies' requirements are adequate to address and contribute to road performance	63 (41.2%)	89 (58.2%)	0 (0.0%)	0 (0.0%)	1 (0.6%)	4.39	0.565
6.	Compliance with regulatory bodies like NCA does guarantee road performance	42 (27.5%)	80 (52.3%)	31 (20.2%)	0 (0.0%)	0 (0.0%)	4.07	0.689
7.	All contractors comply with regulatory bodies' requirements	40 (26.1%)	50 (32.7%)	55 (35.9%)	3 (2.0%)	5 (3.3%)	3.76	0.972
	(c) Compliance with County by-laws							
8.	The county by-laws are adequate in addressing the issues of road performance	9 (5.9%)	60 (39.2%)	76 (49.7%)	8 (5.2%)	0 (0.0%)	3.46	0.688
9.	Contractors/construction adhere to County by-laws	30 (19.6%)	65 (42.5%)	28 (18.3%)	10 (6.5%)	20 (13.1%)	3.49	1.252
10.	Contractors/firms that adhere to County by-laws tend do well in terms of road performance	34 (22.2%)	65 (42.5%)	51 (33.3%)	3 (2.0%)	0 (0.0%)	3.85	0.784
	(d) Adherence to allocation and utilization of resources for accomplishment of project's objectives							
11.	All contractors allocate enough resources to construction works hence good road performance	19 (12.4%)	39 (25.5%)	34 (22.2%)	43 (28.1%)	18 (11.8%)	2.99	1.230
12.	Contractors utilize the right materials and equipment to ensure quality work done	26 (17.0%)	52 (34.0%)	26 (17.0%)	33 (21.5%)	16 (10.5%)	3.25	1.265
13.	Allocation and utilization of right materials and equipment does always lead to road performance	61 (39.9%)	35 (22.9%)	22 (14.3%)	5 (3.3%)	30 (19.6%)	3.60	1.515
	Composite mean and standard deviation						3.60	0.505

ready to make an extra effort to do better beyond their limit. This is a wake up call for all institutions working with contractors and construction firms to put more emphasis on quality of completed road projects. The statement had a standard deviation of 0.891 above the composite of 0.505 hence divergence of opinions.

Statement five, construction regulatory bodies' requirements are adequate to address and contribute to road performance. Out of 153 respondents, 63 (41.2%) strongly agreed, 89 (58.2%) agreed and 1 (0.06%) showed disagreement. The corresponding mean as per this item was 4.39 above the composite mean of 3.60. This implied that there are adequate regulatory requirements in the road construction industry. This therefore signify that technical drawbacks to road performance could be arising from elsewhere. Something that need to be checked thoroughly. A higher standard deviation of 0.689 compared to the composite which was 0.505 signaled divergence in opinions collected.

Statement six, compliance with regulatory bodies like NCA does guarantee road performance. Out of 153 respondents, 42 (27.5%) strongly agreed, 80 (52.3%) agreed and 31 (20.2%) were neutral while none disagreed. The mean of 4.07 above the composite mean of 3.60 implies that complying with the authorized agencies such as NCA positively influences performance. It is therefore important for all contractors to abide by the regulatory requirements if quality and performance must realized. A standard deviation of 0.689 compared to a lower composite standard deviation of 0.505 is an indication the gathered opinions tended to diverge.

Statement seven, all contractors comply with regulatory bodies' requirements. Out of 153 respondents, 40 (26.1%) strongly agreed, 50 (32.7%) agreed, 5 (3.3%) strongly disagreed. 3 (2.0%) disagreed and 55 (35.9%) were of neutral views. The mean 3.76 was slightly above the composite mean of 3.60 indicating that all contractors comply with regulatory bodies requires. Although this maybe true, enforcement is still an issue among some contractors when it comes to groundwork. This area needs keen supervision. The derived standard deviation of 0.972 was below the composite standard deviation of 0.505 implying that the views were divergent.

Statement eight, the county by-laws are adequate in addressing the issues of road performance. Out of 153 respondents, 9 (5.9%) strongly agreed, 60 (39.2%) agreed, 8 (5.2%) disagreed while 76 (49.7%) were neutral. A mean of 3.46 below the composite mean of 3.60 showed that county by-laws were not adequate. There is therefore need for the County government to collaborate with construction authorities and road construction engineering firms to draft more workable laws that would see sanity restored in road construction within the urban centers for realization of improved road performance, especially now that governance powers have been decentralized. With a standard deviation of 0.688 above the composite of 0.505, the findings revealed that the opinions varied among the respondents.

Statement nine, contractors or construction firms adhere to County by-laws. Out of 153 respondents, 30 (19.%) strongly agree, 65 (42.5%) agree, 20 (13.1%) strongly disagree, 10 (6.5%) disagree and 28 (18.3%) neutral. A mean of 3.49 higher than the composite mean on this statement implied that contractors are not adhering to the county by-laws. Despite majority agreeing, the recorded standard deviation 1.252 compared to the composite standard deviation of 0.505 also meant that opinions were divergent.

Statement ten, contractors or firms that adhere to County by-laws tend to produce good results in terms of road performance. Out of 153 respondents, 34 (22.2%) strongly agreed, 65 (42.5%) agreed, a dismal fraction of 3 (2.0%) disagreed and others 51 (33.3%) gave a neutral response. On this statement, the derived mean was 3.85 higher than the composite of 3.60. This therefore implies that it is true that besides adhering to other regulations in construction, observing County by-laws would also significantly enhance road performance. The standard deviation was 0.784 below the composite standard deviation which was 0.505 indicating that opinions gathered were diverging.

Statement eleven, all contractors allocate enough resources to road construction works hence good road performance. Out of 153 respondents, 19 (12.4%) strongly agreed, 39 (25.5%) agreed, 18 (11.8%) strongly disagreed, 43 (28.1%) disagreed and 34 (22.2%) remained neutral. The line item mean of 2.99 was less than the composite mean of 3.60 indicating a critical need for contractors to allocate and use enough resources during construction for this in turn is highly likely to affect or influence road performance in terms of quality. Respondent opinions diverged given a standard deviation of 1.230 for the line item compared to the composite standard deviation of 0.505.

Statement twelve, contractors utilize the right materials and equipment to ensure quality work done. Out of 153 respondents, 26 (17.0%) strongly agreed, 52 (34.0%) agreed, 16 (10.5%) strongly disagreed, 33 (21.5%) disagreed and 26 (17.0%) maintained a neutral stand. The line item mean was 3.25 and the composite mean 3.60. This implies that most contractors do not utilize the right materials for construction and equipment to contribute to quality work in road construction. It also means that those that have could be obsolescent and need replacement to realize quality in completed projects, hence road performance. A standard deviation of 1.265 was obtained which tended to higher than the composite standard deviation of 0.505 hence inconsistency in opinions gathered.

Statement thirteen, allocation and utilization of the right materials and equipment does always lead to road performance. Out of 153 respondents, 61 (39.9%) strongly agreed, 35 (22.9%) agreed, 30 (19.6%) strongly disagreed, 5 (3.3%) disagreed and the remaining 22 (14.3%) gave a neutral opinion. The mean and the composite mean were the same at 3.60. This shows that on average, those contractors allocating and utilizing the right materials and equipments in road construction can lead to good road performance. There is still need to improve this to realize full impact in road performance even though sources of funds remain a constraint in road construction. Generated from this statement was a standard deviation of 1.515 higher than the composite which is 0.505 indicating the respondents' opinions were divergent

Results of interviews with road construction engineers indicated that process monitoring influenced largely the relationship between contractors' capacity evaluation in tender award and 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:

"The role of process monitoring is to ensure that the contractor meet the required capacity in order to secure a sound performance at right time of contract termination; If process monitoring is enforced through adherence to regulations, then the final output will be good. Performance of roads will only be of highly quality if only compliance with construction specification is observed; Process monitoring will help in ensuring that contractor capacity is evidenced in the final product that is a road that is well performing after its completion; Process monitoring will not curb or eliminate rogue contractors but will ensure the road constructed meets at least minimum mark of quality; With strict adherence and enforcement of process monitoring in construction, we are likely to see roads constructed are of high quality and deviations that lead to roads with potholes and accidents are avoided." Road Construction Engineers' Opinions

Results of interviews with public service vehicles (PSVs) drivers indicated that process monitoring influenced to a great extent the relationship between contractors' capacity evaluation in tender award and 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:

"Adequacy of a contractor in terms of financial ability will be early detected to ensure enough funds are put in place to help produce quality roads; Sometimes we can see the road is not performing because of poor workmanship but if process monitoring is made part and parcel of road construction then we are likely to see highly performing roads; I read a newspaper sometime this year (2018) and it noted that the number of footbridges that had been planned for Outer Ring road were at least 10 but a driver we are not to see them anywhere; In short, if road specifications are duly followed to the later then issues of changes in design will not be expected or experienced; With process monitoring being there, you will likely see a road that has properly done signage, zebra crossing for pedestrians and general quality will be something for us citizen to be." PSVs Drivers' Opinions.

Correlation analysis of moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender award 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 process monitoring and performance of road construction infrastructural projects. The values obtained from the correlational analysis ranged between +1 and -1. In this regard, +1 implied perfect positive correlation, while -1 implied perfect negative correlation. 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 findings were as shown in Table 8.

From Table 8, at 0.05 level of significance, there was statistically significant correlation between process monitoring and performance of road construction infrastructural projects (p-value<0.05). The correlation was strong since it had a coefficient of 0.540. This implies the need to have and strengthen process monitoring in road construction.

Regression analysis of moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender and performance of road construction infrastructural projects

The specific objective was to assess the moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects in Nairobi County, Kenya. The indicators of process monitoring were compliance with construction specification; compliance with regulatory requirements; compliance with county by-laws; and adherence to allocation and utilization of resources for accomplishment of objectives of the project. Data collected was carried out by use of five Point Likert Scale.

The following hypothesis was tested using multiple regression model to satisfy the requirements of the sixth objective:

Test of Hypothesis

H_0: Process monitoring does not significantly moderates the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects.

H_1: Process monitoring significantly moderates the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects.

The null hypothesis was tested using the below regression equation:

$Y=a+ \beta1X1+\beta2\ X2+ \beta3X3+ \beta4X4+ \beta5X14+ \beta6X1X14+ \beta7X2X14+ \beta8X3X14+ \beta9X4X14+e$

Where

Y=Performance of road construction infrastructural projects

a= Regression constant

$\beta1, \beta2, \beta3, \beta4, \beta5, \beta6, \beta7, \beta8$, and $\beta9$= Model coefficients

X1= Financial ability of Contractors

X2= Technical Ability of Contractors

X3= Management Ability of Contractors

X4= Contractors' Safety Record

X14= Process Monitoring

e=Error term

The results are presented in Tables 9, 10 and 11.

Hypothesis was tested using hierarchical regression model recommended by Holmbeck [85]. In this operation, the influence of contractors' capacity evaluation in tender award (financial ability, technical ability, management knowledge, and process monitoring) on performance of road construction infrastructural projects was tested in step one, after which the moderating variable (process monitoring) was introduced in step two. Moderation is assumed to take place if the influence of the interaction between the focal independent variable and moderator on dependent variable is significant. According to Baron and Kenny, a moderator is any qualitative or quantitative variable which affects the strength and direction of relationship between the focal independent variable and the dependent variable [86].

Table 8. Correlation Analysis for Moderating Influence of Process Monitoring on the Relationship between Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects

Correlations			
Variable		**Performance of Road Construction Infrastructural Projects**	**Process Monitoring**
Performance of Road Construction Infrastructural Projects	Pearson Correlation	1	0.540**
	Sig. (2-tailed)		0.000
	n	153	153
Process Monitoring	Pearson Correlation	0.540**	1
	Sig. (2-tailed)	0.000	
	n	153	153

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

Table 9. Model Summary for Moderating Influence of Process Monitoring on the Relationship between Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.826[a]	0.682	0.673	0.16993	0.682	79.226	4	148	0.000
2	0.837[b]	0.700	0.690	0.16559	0.018	8.863	1	147	0.003

Model: {F(5,147)=68.520, p=0.000<0.05}

[a] Predictors: (Constant), Contractors' Safety Record, Technical Ability of Contractors, Financial Ability of Contractors, Management Ability of Contractors

[b] Predictors: (Constant), Contractors' Safety Record, Technical Ability of Contractors, Financial Ability of Contractors, Management Ability of Contractors, Process Monitoring

Table 10. Model Summary for Moderating Influence of Process Monitoring on the Relationship between Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.151	4	2.288	79.226	0.000[b]
	Residual	4.274	148	0.029		
	Total	13.424	152			
2	Regression	9.394	5	1.879	68.520	0.000[c]
	Residual	4.031	147	0.027		
	Total	13.424	152			

[a] Dependent Variable: Performance of Road Construction Infrastructural Projects

[b] Predictors: (Constant), Financial Ability of Contractors, Technical Ability of Contractors, Contractors' Safety Record

[c] Predictors: (Constant), Financial Ability of Contractors, Technical Ability of Contractors, Contractors' Safety Record, Process Monitoring

Table 11. Model Coefficients for Moderating Influence of Process Monitoring on the Relationship between Contractors' Capacity Evaluation in Tender Award and Performance of Road Construction Infrastructural Projects

Coefficients[a]											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	2.782	0.173		16.073	0.000					
	Finance	0.230	0.033	0.413	6.990	0.000	0.669	0.498	0.324	0.617	1.620
	Technical	-0.233	0.066	-0.295	-3.524	0.001	0.157	-0.278	-0.163	0.306	3.267
	Management	-0.183	0.064	-0.213	-2.879	0.005	0.057	-0.230	-0.134	0.393	2.547
	Safety Record	0.386	0.040	0.707	9.766	0.000	0.657	0.626	0.453	0.411	2.435
2	(Constant)	3.007	0.185		16.270	0.000					
	Finance	.212	.033	0.380	6.482	0.000	0.669	0.471	0.293	0.595	1.680
	Technical	-0.218	0.065	-0.277	-3.376	0.001	0.157	-0.268	-0.153	0.304	3.287
	Management	-0.209	0.062	-0.243	-3.339	0.001	00.057	-0.266	-0.151	0.385	2.597
	Safety Record	0.579	0.075	1.060	7.681	0.000	0.657	0.535	0.347	0.107	9.320
	Process Monitoring	-0.210	0.071	-0.357	-2.977	.003	0.540	-0.238	-0.135	0.142	7.053

[a] Dependent Variable: Performance of Road Construction Infrastructural Projects

According to Holmbeck, a moderator is one that affects the relationship between two variables, so that the nature and impact of the focal independent variable on the dependent variable varies according to the values of the moderator [85].

Step 1: Influence of contractors' capacity evaluation in tender award on performance of road construction infrastructural projects.

In step one, contractors' capacity evaluation in tender award was regressed on performance of road construction infrastructural projects. The results are presented in Table 10.

Step 2: Influence of contractors' capacity evaluation in tender award and process monitoring on performance of road construction infrastructural projects

In step two, the influence of the moderator (process monitoring) was introduced on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects. The results are presented in Table 9.

The results in Table 9 show that in step one, the adjusted R-Squared is 0.673. This is to mean that contractors' capacity evaluation in tender award explained 67.3% of performance of road construction infrastructural projects. The F value was statistically significant {F (4,148)=79.226, p=0.000<0.05}; implying that contractors' capacity evaluation in tender award influences performance of road construction infrastructural projects.

From Table 10, the ANOVA was used in the study for establishing the model's significance or the model's goodness of fit from which an f-significance value of p less than 0.05 was established (p= 0.00<0.05). The results showed that in both step one and step two, the calculated F were 79.226 and 68.520 significantly larger compared to the critical value of F= 2.433 and F=2.276 respectively. This implied that the model was significant (Table 10).

Using the statistical findings presented in Table 11, the regression model in step one can be substituted as follows:

Y=2.782+0.413X1-0.295X2-0.213X3+0.707X4

Where y= Performance of Road Construction Infrastructural Projects.

X1= Financial ability of Contractors

X2= Technical Ability of Contractors

X3= Management Ability of Contractors

X4= Contractors' Safety Record

In step two, the influence of moderating variable (process monitoring) was introduced on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects. The results demonstrate that upon introduction of the moderating variable (process monitoring) and the interaction term to the model 2, the value of adjusted R-square increased by 0.690 (Table 9). This implies that contractors' capacity evaluation in tender award and process monitoring (together) explain 69.0% of performance of road construction infrastructural projects. The F-value was statistically significant {F (5,147)=68.520, p=0.000<0.05}.

Using the statistical findings in model 2 (Table 11), the following regression equation was obtained:

Y=3.007+0.380X1-0.777X2-0.243X3+1.060X4+0.357X5

Where y= Performance of Road Construction Infrastructural Projects.

X1= Financial Ability of Contractors

X2= Technical Ability of Contractors

X3= Management Ability of Contractors

X4= Contractors' Safety Record

X5= Process Monitoring

From the foregoing, it can be concluded that process monitoring significantly moderates the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects. Accordingly, we reject the null hypothesis (H_0), which stated that process monitoring does not significantly moderate the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects. We conclude that the strength of relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects depends on process monitoring. Thus, we accept the alternative hypothesis (H_1) to state that process monitoring significantly moderate the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects

The current study has found that even though majority of firms or contractors agree that complying with construction specifications would lead to construction of quality roads, the level of compliance is still weak and demands regular process monitoring. The findings echoes a study by Mwangu and Iravo who determined that M&E instruments are not fully employed by contractors as well as project supervisors in their project functions [52]. The findings of the current study further established that contractors do not strive to make improvement beyond the tasks allocated to them even after completing construction. At the same time, not all contractors are committed to allocating adequate resources hence poor performance of roads in the post-delivery stage. This colloborates with the study findings of Byaruhanga and Basheka who established that project performance was affected by award of contracts to undeserving contractors due to weak systems of procurement; incompetence of staff involved in the procurement exercise; none existent contractor apparisal system; service delivery challenges due to delayed payments; weak internal M&E systems [60].

It was revealed from the current study that neither county by-laws on road construction are adequate nor contractors are keen to adhere and follow the existing ones. By introducing the interaction term (moderator) in the second model, the influence of combined contractors' capacity improved significantly. This findings point out the need for effective monitoring as Hassan emphasized that monitoring has a critical influence in ensuring required quality standards are attained in the course of project implementation [50]; which in turn has a significant on overall influence on performance. Similarly, the findings resonates with Umugwaneza and Kule who argued that organizations should consider monitoring and evaluation as mandatory at all levels of the projects [61]. However, the findings are supported

by Ng'etich and Otieno agree that to strengthen process monitoring in the road construction projects, there is need to to engage stakeholders, involve the right technical team and fundamentally avail funds [17].

Further, the findings of the current study show that R was 0.837 and adjusted R squared (R2) was 0.690 indicating that 69% of performance was as a result of the second model (combined contractors' capacity and process monitoring). This is a slight increase compared with the findings of Asinza, et al., who investigated on the effect of monitoring and financial capacity on quality of projects [19]. Monitoring factors considered for the study were extent of monitoring and monitoring methods, which had a strong and significant positive relationship with project quality ($r = 0.893$, $p < 0.05$) followed by financial capacity ($r=0.475.p<0.05$). The overall regression model gave R2 of 0.354. This showed that about 35% of variations in project performance was as a result of monitoring and financial capacity. The current findings shows therefore the need of combining various factors alongside project monitoring to yield better results in project performance. The findings further supports the Wanjala, Iravo, Odhiambo and Shalle observed that monitoring techniques applied in an organization within state corporations have significant effect on the project performance ($\beta = 0.674$, $p<0.05$) [18].

The study objective was supported by data, hence the strength of relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects depends on process monitoring.

Conclusion

The objective of the study was to assess the moderating influence of process monitoring on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects in Nairobi County, Kenya. The null hypothesis tested in this regard was that process monitoring does not significantly moderate the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects.

The results were presented in two steps. That is, in step 1: $R=0.826$, adjusted $R2=0.673$, $F(4,148)=79.226$, $p=0.000<0.05$ hence F-value was considered statistically significant and in step 2: $R=0.837$, adjusted $R2=0.690$, $F(5,147)=68.520$, $p=0.000<0.05$ hence F-value was statistically significant; the null hypothesis was thus reject, and it was concluded that process monitoring has significant influence on the relationship between contractors' capacity evaluation in tender award and performance of road construction infrastructural projects. Moreover the results revealed that upon introduction of process monitoring as a moderator, the percentage rose by 1.7% resulting to 69.0% of performance of road construction infrastructural projects. This little improvement as a result of process monitoring indicates that the if the construction industry would engage more in monitoring of the road projects by sticking to the required processes then we are likely to experience huge impact. It would then mean that there is need to institutionalize M&E aspects in road construction projects and any other infrastructural projects.

Recommendations

The assessment of the contractor ability could be enhanced by adding up more factors or assessment criteria and most importantly incorporating process monitoring as part of the criteria to be able to arrive at the right decision on contractors selection. The indicators used to explain the aspects of process monitoring (compliance with construction specification, compliance with regulatory bodies' requirements, compliance with county by-laws, resolution to complaints management, adherence to allocation and utilization of resources for accomplishment of project's objectives) should be made part and parcel of road performance. There is need to effectively implement policies that support process monitoring in road construction so as to boost the image of the industry and contractors at large.

Further Studies

A similar study may be carried out on building construction using the same variables. focused on Nairobi County, and therefore generalization of the findings to other parts of the regions or counties can not be scientifically practical and hence to replicate the same study to other geographical areas in Kenya.

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Author Contributions

Mushori conceived the project's idea and guided data collection, analysis and report writing. Prof. Charles Mallans Rambo and Dr. Charles Misiko Wafula assisted in selection and defining indicators of the study. They also played critical role in reviewing the paper.

Conflict of Interest

The authors wish to declare that there is no conflict of interest.

References

1. Atieno, Oguya, Sarah and Muturi, Willy. "Factors Affecting Performance of Road Construction Projects in Arid and Semi-Arid Areas in Kenya." Int J Soc Sci Inf Tech 2 (2016): 908-929.
2. Tebeje, Zewdu, Zenabu and Teka Aregaw, Getachew. "Causes of Contractor Cost Overrun in Construction Projects: The Case of Ethiopian Construction Sector." Int J Bus Econ Res 4 (2015): 180-191.
3. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Kenya_-_Nairobi_Outer_Ring_Road_Improvement_Project_-_Appraisal_Report.pdf
4. Onyango, Bwisa and Orwa. "Critical Factors Influencing the Implementation of Public Infrastructure Projects in Kenya: A Case of Thika Sub-County, Kiambu County Kenya." Int J Sci Res Publications 7 (2017): 2250-3153.
5. https: //www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=2ahUKEwilm6aLwbzoAhUlRBUIHRuYAbMQFjAAegQIARAB&url=https%3A%2F%2Ftreasury.go.ke%2Fcomponent%2Fjdownloads%2Fsend%2F89-2010%2F52-physical-infrastructure-sector.html&usg=AOvVaw2rlqaWm0XvO598CbyIPfzO
6. Kimani, ME. Performance Analysis of Nairobi Eastern ByPass. Department of Civil and Construction Engineering, Jomo Kenyatta Memorial Library (Book Shelf): University of Nairobi (2015).
7. https: //www.iajournals.org/articles/iajispm_v2_i2_111_123.pdf
8. https://www.semanticscholar.org/paper/FACTORS-INFLUENCING-COMPLETION-OF-GOVERNMENT-ROAD-A-Kithinji/f3a5c1d28a52be2953050938a2270d3f282533f6
9. Ugochukwu and Onyekwena. "Participation of Indigenous Contractors in Nigerian Public Sector Construction Projects and their Challenges in Managing Working Capital." Int J Civil Eng Est Manage 1 (2014): 1-21.
10. http: //ijebmr.com/uploads2018/IJEBMR_02_127.pdf
11. Naik, Sharma, and Kashiyani. " A Review of Factors Affecting Contractor Performance in Construction Work." Int J Adv ResEngSci Manage (2015).
12. Omran, Abdalrahman and Pakir. "Project performance in Sudan Construction Industry. A Case Study." Acad Res J 1 (2012): 55-78.
13. https: //doi.org/10.1108/13664380910977619
14. Jannadi, Osama Ahmed and Bu-Khamsin Mohammed. "Safety factors considered by industrial contractors in Saudi Arabia." Build Environ37 (2002): 539-547.
15. http: //dx.doi.org/10.4236/ojsst.2012.24018
16. http: //www.fissuredworkplace.net/assets/Weil.AssessingOSHAConstruction.JPAM.2001.pdf
17. Ng'etich, KV and Otieno MM. "Factors Influencing Monitoring and Evaluation Processes of County Road Projects in Turkana County Government, Kenya." International Journal of latest Research in Engineering and Technology 3 (2017): 30-41.
18. Wanjala, Muchelule Yusuf, Iravo Mike Amuhaya, Odhiambo Romanus

and Shalle Noor Ismail (2017). "Effect of Monitoring Techniques on Project Performance of Kenyan State Corporations." Eur Sci J 13 (2017): 264-280.

19. Asinza, Karen, Kanda Edwin, MucheluleYusuf and Mbithi Shedrack. "Influence of Financial Capacity and Monitoring on Project Quality of Housing Construction in Nakuru County, Kenya." Int J ResManage, Sci and Tech 4 (2016): 38-43.
20. https://www.academia.edu/37691876/Monitoring_Intensity_and_Procurement_Performance._EmpricalEvidence_from_Elgeyo_Marakwet_County_Kenya..pdf
21. Haas, Ralph , Felio Guy, Lounis, Zoubir and Falls, Lynne Cowe. "Measurable Performance Indicators for Roads: Canadian and International Practice." NRC Publications Archive (2009).
22. Omran, Abdelnaser, Abdalrahman alma and Pakir Abdul Hamid Kadir."Project performance in Sudan Construction Industry. A Case Study." Acad Res J 1 (2012): 55-78.
23. Neely, Andy. "The Performance Revolution: Why Now and What Next?." International Journal of Operations & Production Management 12 (1999): 69-81.
24. https: //doi.org/10.1061/ (ASCE)0742-597X (2004)20: 2 (42)
25. https: //scholar.google.com/scholar?q=related: CMLuM3Na1uUJ: scholar.google.com/&scioq=25.Ogweno,+B.,+Muturi,+W.+%26+Rambo,+C.+(2016).+Determinants+of+Timely+Completion+of+Road+Construction+Projects+Financed+By+Kenya+Roads+Board+in+Kisumu+County.+International+Journal+of+Economic+Governance+and+Management,+4(11),360-402.&hl=en&as_sdt=0,5
26. Shenhar, AJ, Levy O and Dvir D. "Mapping the Dimensions of Project Success." Project Management Journal 8 (1997): 5-13.
27. Sadeh, Arye, Dvir Dov and Shenhar Aaron "The Role of Contract Type in the Success of R&D Defense Projects unde r Increasing Uncertainty." Project Management Journal 31 (2000): 14-21.
28. Obare, Josiah Obiria, KyaloDorothy Ndunge, Mulwa Angeline Sabina and Mbugua John. "Implementation Process of Project Control Systems, Project Team Training Diversity and Performance of Rural Roads Construction Projects in Kenya." International Journal of Innovative Research & Development 5 (2016): 12-22.
29. Thomas, SN, Palaneeswaran, Ekambaram and Kumaraswamy Mohan M."A dynamic e-reporting system for contractor's performance appraisal." Advances in Engineering Software 33 (2002): 339-349.
30. Rao, MV Krishna, Kumar VSS and Kumar P Rathish. "Prequalification of Contractor in the Construction Industry Using Multi-Attribute Utility Theory: A Multiplicative Approach. Malaysian." J Civ Eng 28 (2016): 467-480.
31. Rashvand, Pooria, Majid Muhd Zaimi Abd, Baniahmadia Mahmoudand Ghavamirad Farzan, "Contractor Selection at Prequalification Stage: Current Evaluation and Shortcomings." Jurnal Teknologi 77 (2015): 81-89.
32. Chiang, Fu-Yuan, Vincent F and Luarn Pin. "Construction Contractor Selection in Taiwan Using AHP." Int J Eng Technol 9 (2016): 211-215.
33. http: //www.ijesi.org/papers/Vol (3)7/Version-2/I0372044048.pdf
34. Trivedi, MK, Pandey MK and Bhadoria SS. "Prequalification of Construction Contractor using a FAHP." IntJComput Appl 28 (2011): 39-45.
35. Hatush, Zedan and Skitmore, Martin. ." Assessment and evaluation of contractor data against client goals using PERT approach." Const Manage Eco 15 (1997) : 327-340.
36. https: //scholar.google.com/scholar?q=related: B_V6Uvefsz0J: scholar.google.com/&scioq=36.Zedan,+H.+%26+Skitmore,+R.M.+(1994).+Contractors%E2%80%99+prequalification+and+bids+evaluation+%09(unpublished).&hl=en&as_sdt=0,5
37. Russell, Jeffrey S and Skibniewski Miroslaw J. "Decision criteria in contractor prequalification." J Manage Eng42 (1988): 148-164.
38. Herbsman, Zoharand Ellis Ralph "Multiparameter bidding system-innovation in contract administration." J Construct Eng Manage 118 (1992): 142-150.
39. https: //scholar.google.com/scholar?q=related: Hn2dizp9nmAJ: scholar.google.com/&scioq=39.Ogbebor,+P.O.+ (2002).+Enhancing+Indigeneous+Construction+Industry+as+a+National+Goal+%09on++Nigerian+%09Development.&hl=en&as_sdt=0,5
40. https://pdfs.semanticscholar.org/6145/3e8fd1e7df093ea1ec515981f088a135148a.pdf?_ga=2.121585160.1612128320.1575632024-369761160.1575632024
41. file: ///C: /Users/Administrator/Downloads/5725-7821-1-PB%20 (4).pdf
42. Greenfield and Morgan. "Management of Health and Safety Performance of Facilities Management. Hertfordshire, UK: British Institute of Facilities Management." (2014).
43. Onatere, Joyce O, Nwagboso Christopher and Georgakis Panagiotis. "Performance Indicators for UrbanTransport Development in Nigeria WIT Transactions on the Built Environment." 138 (2014).
44. Quiroz. "Options for Implementing Performance-Based Contracts." . Transport Forum, Washington DC (2005).
45. http: //rszarf.ips.uw.edu.pl/ewalps/dzienne/cipp-model-stufflebeam2015.pdf
46. https: //scholar.google.com/scholar?q=related: ocHF689C_LsJ: scholar.google.com/&scioq=46.Chikati,+J.+ (2009).+Monitoring+and+Evaluation+Handbook.+Nairobi: +Regional+Partnership+for+Resource+%09Development.&hl=en&as_sdt=0,5
47. https://www.ifrc.org/Global/Publications/monitoring/IFRC-ME-Guide-8-2011.pdf
48. https: //books.google.com/books?hl=en&lr=&id=Bo0MSZ_IlqAC&oi=fnd&pg=PT7&dq=48.O%E2%80%99Sullivan,+R.G.+(2004).+Practicing+Evaluation: +A+Collaborative+Approach.+London: +Sage+Publications.&ots=AAtP-1Iipb&sig=gdD3PKsbzlEaQKIa5gsOGoC5tQk
49. https://books.google.com/books?hl=en&lr=&id=eDZ2DwAAQBAJ&oi=fnd&pg=PP1&dq=49.Rossi,+P.H.,+Lipsey,+M.+W+%26+Freeman,+H.E.+(2004).+Evaluation: +A+Systematic+Approach+ (7th+ed.).+London: +Sage+Publications.&ots=ymJ1KDC3rQ&sig=ExZ83a0Gz61BZrc8idfvssTObKw
50. Hassan, Ali Ibrahim. "An Investigation of Structural Capacity as a Component of Monitoring and Evaluation in Project Success of Road Construction Projects in Kenya." Int JAcad Res Bus Soc Sci3 (2013): 443-452.
51. Kamau,Charles G and Mohamed Humam Bin."Efficacy of Monitoring and Evaluation in Achieving Project Success in Kenya: A Conceptual Framework." Sci J Business Manage 3 (2015): 82-94.
52. http: //hrmars.com/hrmars_papers/How_Monitoring_and_Evaluation_Affects_the_Outcome_of_Constituency_Development_Fund_Projects_in_Kenya_A_Case_Study_of_Projects_in_Gatanga_Constituency.pdf
53. Ngosong. Investigation of Problems or Challenges Faced by the Procurement and Delivery of Quality Construction in Africa and Cameroon. School of the Build Environment, College of Science and Technology, University of Salford, Manchester, the Crescent, Salford, M5 4WT, United Kingdom (2015).
54. http://documents.worldbank.org/curated/en/881961510728438206/Managing-contractors-environment-and-social-performance
55. Nsasira, Rachael, Basheka Benon C and Oluka Pross N. "Public Private Partnerships (PPPs) and Enhanced Service Delivery in Uganda: Implications from the Energy Sector. Int J Bus Adm 4 (2013): 48-60.
56. Davidson, Bill and Sebastian Richard J. "The Relationship between Contract Administration Problems and Contract Type." Journal of Public Procurement 9 (2009): 262-286.
57. Salapatas, JN. "Performance Measurement for Projects and Project Management." Project Management Journal 16 (1985): 29-33.
58. Ojok, James and Basheka, Benon C. "Measuring the Effective Role of Public Sector Monitoringand Evaluation in Promoting Good Governance in Uganda: Implications from the Ministry of Local Government." Africa's Public Service Delivery & Performance Review 4 (2016).
59. https: //pdfs.semanticscholar.org/8d73/0e70153473b8e07eb75769d85208d0c734c6.pdf
60. Byaruhanga, Aloysius and Basheka, Benon C. "Contractors Monitoring and Performance of Road Infrastructure Projects in Uganda: A Management Model." J Build Const Plan Res 5 (2017): 30-44.
61. Umugwaneza, Alice and Kule Julius Warren. "Role of Monitoring and Evaluation on Project Sustainability in Rwanda: A Case of Electricity Access Scale-Up and Sector-Wide Approach Development Project (EASSDP)." Europe Journal of Business and Social Sciences 597 (2016): 159-177.

62. Wambugu, Kyalo, Mbii, and Nyonje. "Research methods: Theory and practice." Aura Publishers Nairobi (2015).
63. Rugman, Alan M. and Verbeke, Alain. "EDITH Penrose's Contribution To The Resource-Based View of Strategic Management." Strateg Manage 23 (2002): 769-780.
64. Theriou, Nikolaos, Aggelidis Vassilis and Theriou Georgios. "A Theoretical Framework Contrasting the Resource- Based Perspective and Knowledge-Based View." Eur ResStud 7 (2009): 177-190.
65. Muller, Ralf and Jugdeve, Kam."Critical Success Factors in Projects: Pinto, Slevin, Prescott – the elucidation of Project Success." Int J Manag Proj Bus 5 (2012): 757-775.
66. Pitelis, Christos N. "Edith Penrose and the Resource-Based View of (International) Business Strategy." Int Bus Rev 13 (2004): 523-532.
67. https://www.elgaronline.com/view/edcoll/9781783479658/9781783479658.00021.xml
68. Barney,Jay. "Firm Resources and Sustained Competitive Advantage." J Manage 17 (1991): 99-120.
69. Hijzen, Alexander, Gorg Holger and Hine Robert C. "International Outsourcing and the Skill Structure of Labour Demand in the United Kingdom." Economic J 115 (2005): 860-878.
70. Jaafar, Mastura, Rashid Abdul and Aziz Abdul."Resource-Based View and Critical Success Factors: A Study on Small and Medium Sized Contracting Enterprises (SMCEs) in Malaysia." Int J Con Manag 5 (2005).
71. Creswell, JW. "Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. (4th Edition) Thousand Oaks." Sage Publications (2014).
72. Leech, Nancy L and Onwuegbuzie Anthony J. "A typology of mixed methods research designs', Quality and Quantity." Int J Meth 43 (2009): 265-275.
73. http: //agris.fao.org/agris-search/search.do?recordID=US201300557232
74. https://books.google.com/books?hl=en&lr=&id=7sZHuhyzBNQC&oi=fnd&pg=PR5&dq=74.Bernard,+H.R.+(2000).+Social+Research+Methods: +Qualitative+and+Quantitative+Approaches.+Thousand+%09Oaks,+California: +Sage+Publications.&ots=edTIV5kwTG&sig=vNh_f_dEJCPQrZuSsb-fSnTXVGM
75. Gakuu, Celestine Mutheu, Kidombo and Keiyoro Peter Njenga. "Fundamentals of Research Methods: Concepts, Practice & Applications." Aura Publishers: Nairobi 11 (2018): 2259-2262.
76. https://books.google.com/books?hl=en&lr=&id=hZ9wSHysQDYC&oi=fnd&pg=PA2&dq=76.Kothari,+C.R.+(2004).+Research+Methodology:+Methods+%26+Techniques.+ (2nd+Edition).+New+Delhi: +New+%09Age+International+(P)+Ltd.&ots=1s-doGd3F7&sig=eDteMZRK7FgGweYqC3PVWsXsiYM
77. https://www.researchgate.net/profile/Bee_Yap/publication/267205556_Power_Comparisons_of_Shapiro-Wilk_Kolmogorov-Smirnov_Lilliefors_and_Anderson-Darling_Tests/links/5477245b0cf29afed61446e1/Power-Comparisons-of-Shapiro-Wilk-Kolmogorov-Smirnov-Lilliefors-and-Anderson-Darling-Tests.pdf
78. https: //books.google.com/books?hl=en&lr=&id=cOt9yDjlSQMC&oi=fnd&pg=PR10&dq=78.Bierman,+H.,+Bonini,C.+%26+Hausman,+W.+ (1997).+Quantitative+Analysis+for+Management.+New+York: +Irwin+McGraw-Hill.&ots=ro_RXCIzWy&sig=kVkrKuP-NiE0Tj2VfaNEIRPw-8o
79. Bryman, Alan. "Introduction to Social Research Methods." Sage Publications (2008).
80. https: //books.google.com/books?hl=en&lr=&id=Ko6bCgAAQBAJ&oi=fnd&pg=PA19&dq=80.Sekaran,+U.+ (2003).+Research+methods+for+Business: +A+Skill+Building+Approach.+New+York: +John+Wiley+%26+Sons.+Journal+of+Management+in+Engineering,+ASCE,+4 (2),+148-64.&ots=2B5RU4LUqR&sig=uQe35HlyjX5mDPGuNON5Gu491rU
81. Enshassi, Adnan, Mohamed Sherif and Abushaban Saleh. "Factors Affecting the Performance of Construction Projects in the Gaza Strip." J Civ Eng Manag 15 (2009): 269-280.
82. http: //citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.736.72&rep=rep1&type=pdf#page=945
83. https: //books.google.com/books?hl=en&lr=&id=dDGPPd_4y5sC&oi=fnd&pg=PR17&dq=83.Saunders,+M.,+Lewis,+P.+%26+Thornhill,+A.+ (2009).+Research+Methods+for+Business+Students.+New+York: +Pearson.&ots=YYXFYHOB8j&sig=mSh47GswvNkzTYf3QUv9nQ8_QKE
84. Mugenda and Mugenda."Research methods: Quantitative and Qualitative Approach." Nairobi: ACTS Press (2003).
85. Holmebeck,NHolmbeck. "Toward Terminological, Conceptual, and Statistical Clarity in the Study of Mediators and Moderators: Examples from the Child-Clinical and Paediatrics Psychology Literatures." J Consult Clin Psychol 65 (1997): 599-610.
86. Baron, Reuben and Kenny David. "The moderator-mediator variable distinction in social Psychological research: Conceptual, Strategic, and Statistical Considerations." J Pers Soc Psychol 51 (1986): 1173-1182.

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