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PROJECT COST MANAGEMENT PROCESS AND PERFORMANCE OF ROAD PROJECTS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

The general objective of the study was to determine the effect of project cost management processes on performance of road projects in Kenya. The specific objectives were to examine effect of; cost scheduling and control costs on performance of road projects in Kenya. The studywas guided theory of transactive planning and theory of constraints. The study used a descriptiveresearch design. The study target population was 51 road projects in Nairobi City County, Kenya. The unit of observation was 51 project managers, 51 project contractors, and 51 roads engineers. Sample size was 153 road project professionals since the study adopted census. This study usedstructured questionnaires to collect data. The pilot study was carried out among 10% of the sample hence 15 road project professionals. This study used content and construct validity. To ensure the reliability of the questionnaires, the researcher used Cronbach's Alpha Coefficient. Questionnaires were coded and keyed into SPSS Version 28. Findings were tabulated. The pilot test results demonstrated the robustness and reliability of the research instruments. With Cronbach's alpha values for all constructs exceeding the acceptable threshold of 0.7, the instruments showed high internal consistency. Additionally, expert reviews confirmed content validity, ensuring the questionnaire's accuracy and relevance. Factor loadings analysis further established construct validity, with all variables meeting or surpassing the recommended AVE threshold of 0.5. These preliminary findings indicate that the study's measurement tools are bothreliable and valid for the intended research. The findings revealed that cost scheduling ($\beta = 0.294$, $p = 0.000$), and cost control ($\beta = 0.301$, $p = 0.000$) significantly influence project performance, with cost control having the highest impact. The results indicate that effective management of these processes enhances project success by ensuring timely completion, cost efficiency, and stakeholder satisfaction. The study concludes that comprehensive cost management practices are critical for the successful implementation of road projects. Cost control, in particular, plays a pivotal role in maintaining financial discipline and preventing budget overruns. The study recommends that project managers adopt advanced tools and techniques for cost scheduling and strengthen cost control measures through regular monitoring and reporting. Further research should explore the impact of external factors on cost management and the use of technology in enhancing these practices across different types of infrastructural projects.

Key Words: Project Cost Management Processes, Cost Scheduling, Control Costs, Performance of Road Projects

Background of the Study

The PMBOK identifies four main processes in project cost management which include cost scheduling, cost estimation, budgeting, sponsoring, funding, handling, and monitoring (PMBOK, 2017). Roseke (2016) Project cost management is predominantly concerned with the cost of the resources required to complete scheduled project activities during the execution stage and this includes the costs incurred during tendering, construction, maintaining, and supporting results of a project. Ronald and Agung (2018) stated that cost management processes involves various work phases that include the initial stage, the planning stage, the implementation stage, the control stage, and the completion stage. Project cost management has become a basic requirement for the project's success. Successful projects require an elaborate project cost management process to manage and evaluate the progress of the project. The successful completion of projects across different sectors and industries is one of the most significant reasons that determine the growth and development of many nations.

Project cost management ensures that project cost performance is monitored, changes are corrected and changes that will impact cost are identified and communicated to project stakeholders in time. Effective cost management ensures that the financial status of any business/project venture is identified through cost monitoring. This helps companies make an informed decision that will bring sustainable growth and development (Andres, 2021). Nor (2022) asserted that poor cost management could jeopardize the fundamentals of managing a project. Many countries are facing various problems associated with cost overrun during the implementation phase of projects. Cost variation from the initial cost budget and cost plan has been known as common problem in the project management and it creates a concern to project stakeholders.

Mondejar (2020) asserted that project cost management is very essential to project management. It is also a method that uses technology to quantify cost and profitability throughout the full life cycle of big business level activities. Cost management is significantly important as it entails how the project plan will be used to control the budget of a certain project or business. Activities such as planning, estimation, budgeting, financing, funding, managing and controlling costs are required for the purpose of creating an effective cost management plan. Rugenyi (2015) argues that activities in the project cost management process include establishment of cost estimates for resources, establishing budgets, and monitoring those costs to ensure that project implementation isconducted as per the approved budget. Mutiso and Nyang'au (2021) revealed that all the project cost management dimensions had a positive and significant relationship with implementation of county government funded water projects. The project cost control had the largest effect followed by project cost reporting then project cost contingencies and finally, the project`s methods of cost estimation.

Statement of the Problem

Project cost management is a critical component in ensuring the success of infrastructural projects globally, and road projects are no exception. In Nairobi City County, the failure to implement effective project cost management processes has significantly contributed to project underperformance, with cost overruns and delays being the most prevalent issues. These problems not only strain public resources but also hinder the achievement of strategic national goals, such as Kenya's Vision 2030, which prioritizes infrastructure development to stimulate economic growth. Despite the substantial investments in road infrastructure, the performance of road projects in Nairobi City County has been marked by inefficiencies. Studies have shown that a significant number of road projects fail to meet their performance criteria, particularly in terms of time, cost, and quality. According to Deloitte (2018), 48% of infrastructure projects in Kenya experienced cost overruns, while 87% suffered time overruns, signaling widespread project management issues. Similarly, Hussein (2019) found that 79.2% of road projects in Kenya exhibited negative performance indicators, further emphasizing the systemic nature of these challenges.

The complexity of road projects, particularly those involving additional structures such as bridges,

exacerbates the issue. For instance, Mongina (2021) highlighted that cost overruns were 14% higher in complex road projects, while 54% of projects faced delays during the initiation phase. This results in a cascading effect on the completion rate of road projects, with a large number being abandoned before completion. Between 2008 and 2013, data from the Kenya National Bureau of Statistics (KNBS) indicated that 47.5% of road projects were not completed within their planned schedules, illustrating a consistent trend of poor project delivery across various regions and types of projects (Kimemia, 2015).

Beyond financial and temporal challenges, the underperformance of road projects has broader social implications, particularly concerning road safety and user satisfaction. Kamau and Waweru (2020) reported that road accidents and fatalities increased significantly, with the proportion of injuries and deaths rising from 26% in 2015 to 46.5% in 2020. Vulnerable road users, including pedestrians, cyclists, and bodaboda riders, have been disproportionately affected, accounting for 46% of road fatalities (WHO, 2019). These statistics underscore the impact of poorly executed road projects on public safety, especially in a country where 95% of the population relies on road transport for daily commuting and economic activities (Ondieki, 2016).

While research on project cost management in other sectors such as real estate and water projects has demonstrated a positive correlation between cost management processes and project success (Betru, 2021; Mutiso & Nyang'au, 2021), there remains a critical gap in understanding the specific cost management challenges and their impact on the performance of road projects in Nairobi City County. Onyango (2021) suggested that issues related to technical imprecisions, funding, and regulatory costs significantly influence the implementation of construction projects,yet there is a lack of focused studies on road projects in Nairobi City County.

Therefore, this study sought to fill this gap by examining the cost management processes employed in road projects in Nairobi City County and assessing their impact on project performance. Addressing these challenges is essential to improve the timely and cost-effective delivery of road projects, ensuring the sustainable use of public funds, enhancing road safety, and ultimately contributing to the achievement of broader national development goals.

Research Objectives

The general objective of the study was to determine the effect of project cost management processes on performance of road projects in Nairobi City County, Kenya.

Specific Objectives

i. To determine the effect of cost scheduling on performance of road projects in Nairobi CityCounty, Kenya.

ii. To examine the effect of cost control on performance of road projects in Nairobi City County, Kenya.

LITERATURE REVIEW

Theoretical Review

Theory of Transactive Planning

Theory of Transactive Planning was introduced by Friedmann (1973). Transactive planning transforms knowledge to action by means of dialogue between actors. Transactive planning generally represented a radical breakthrough with quantitative, and a spatial model of planning which involves a more 'people-oriented' approach for project planners and a great concern for the less disadvantaged and inarticulate individuals/groups in society in relation to the communication gap between project stakeholders and project planners(Friedmann & Huxley, 1985).The theory advocates for an immediate solution to be figured out to ensure that scientific and technical knowledge are combined with personal knowledge to assist various project stakeholders understand the basics of the project through an elaborate and efficient communication of information in relation to the project. Transactive planning encompasses a

series of efforts aimed towards bridging the gap between the planner's technical and scientific knowledge and the primary stakeholders' local knowledge. The approach is based on a direct communication with the regional planning policy makers so that they can conform to planning knowledge that should be communicated to the project team. The policy briefing must be conducted because of the social intervention that usually occurs by regional deliberativeplanning as a suitable instrument for bottom-up development planning. Transactive planning has a democratic result and is an approach which if often expected to build a middle path to attain harmonization between project planners and the community at large, which consists of the heterogeneous interests within the community.

Friedmann points out that the gap between planners and program implementation team is increasingly widening because there exists minimal communication among them. Consequently, the planner, before suggesting solutions, must establish personal contact and relations with the project team, and this contact must be relayed continuously until the planning (or the action) has been carried out. Instead of a formalized paper contact, the most important thing is a personal, verbal communication between the planner and client/stakeholders. The objective should entail the acquisition of mutual insight into each other's knowledge of the planning process and that this knowledge will result in to an action. Transactive planning approach majorly focuses on the full knowledge the of community to reveal planning issues that are necessary to be addressed. It incorporates a face-to-face dialogue approach with the community, which has a significant impact on the project planning outcome. The theory minimizes field surveys and data analysis simply because it is carried out through interpersonal dialogues characterized by a mutual learning process for all parties involved (Hudson,1979).

However, there is a limited understanding of the transactive process within the community based level deliberation. The communicative planning theory does not provide a thorough analysis of the transfer of knowledge (transaction of information) that occurs during the occasioned meetings between the planners and the community. Consequently, it is difficult to comprehend where problems arise from during the deliberation process and is not surprising that some experts doubt the effectiveness of such deliberations. Through an elaborate communication plan, the project managers must therefore ensure that the projects funds are well planned and allocated to the project activities accordingly and the same is communicated to various stakeholders promptly. This ensures thatthe project costs are well management to avoid costs overruns and project delay. The Theory of Transactive Planning directly relates to the objective of determining the effect of cost schedulingon the performance of road projects in Nairobi City County. Effective communication and planning are essential for timely cost scheduling, which helps prevent delays and overruns.

Theory of Constraints

According to Eliyahu, (1984) theory of constraints is a procedure for recognizing restrictive feature that prevents realizing a goal and then analytically refining the identified limitation to a level where it becomes a non-limiting factor (Dettmer, 2007). Eliyahu cited that a chain is only as strong as the weakest link, and therefore advanced the theory of constraints to identify the weak links and reduce their susceptibility. There are four major elements of the theory of constraints which include constraints, five focusing steps, thinking processes, and throughput accounting. Constraints are the factors that limit the productivity and the five focusing steps enable project managers identify the limitations. The thinking processes are problem solving tools that enable improvement of the constraints. There are also assumptions to this theory which include; throughput which is the rate at which goal units are produced, operational expense which is the finances spent in producing the units, and investment which is the overall financial input for the system (Landau, 2018).

In project management, focusing on the limitations and eliminating the constraints work to improve project outcomes. An entity should first consider whether the existing level of production is satisfactory and if not, assess the constraints and eliminate them so as to improve the overall productivity. In addressing constraints, it is also important to check the feasibility of the process used in addressing the limitation. The five focused steps that can be implemented in elimination

of constraints include; identification of the constraint, exploitation of the constraint, subordination of the constraint, elevation of the constraint, and repetition of the process (Landau,2018).

Core to this study is the conviction that poor cost management creates a bottleneck that hinders successful completion of projects. The theory of constraints uses a systematic approach to organizational capacity enhancement and considers not only the role of system problems but also the external factors that determine overall performance. The theory of constraints suggests that every multipart structure, including manufacturing processes, include numerous connected activities, where eventually, one opposes the entire system and acts as a constraint. The key idea of the Theory of Constraints is that each process has a limitation, and that entire process output can only be improved when the limitation is improved. The theory supports the objective on cost control since all project costs must be confined within the project activities. The Theory of Constraints supports the objective of examining the effect of cost control on the performance of road projects in Nairobi City County. By identifying and addressing cost-related constraints, project managers can enhance overall project performance.

Conceptual Framework

The conceptual framework in Figure 2.1 demonstrates the linkage between independent variables and dependent variables. The independent variables are; cost scheduling and control costs. The dependent variable is the performance of road projects. These variables and relationships are presented in Figure 2.1.

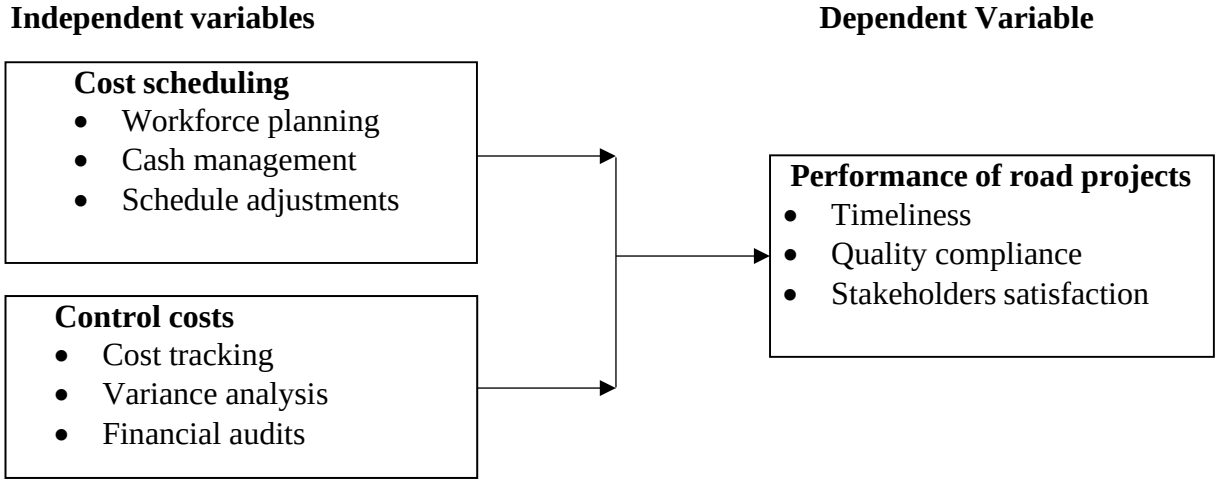

Figure 2.1: Conceptual Framework

Cost Scheduling

Costs scheduling refers to the process of analyzing and forecasting the project's total costs to determine how to allocate the project's budget (Darwish, 2017). Cost scheduling determines the resources required to deliver a project within the set timeline and the approved budget. Project managers with vast experience are ableto accurately dictate the tasks, effort and money required to complete a project. Kirkham (2014)discussed the importance of project cost planning as an activity that aims at ascertaining costs before any decisions are made in relation to the design of building project. It provides a statementof the key issues, identifies the various courses of action, determines the cost implications of each course and provides a comprehensive economic picture of the whole".

Alao and Godwin (2017) further indicated that poor financial management and ineffective planning could lead to cash flow problems causing bankruptcy and delays in implementation. Therefore, project managers are encouraged to put in place adequate cash flow plans to predict possible trends in cash utilization and management to avert cash deficits. Project managers use cost scheduling to make sure they are using resources and members of their team effectively. They also use it to forecast future needs so that they can have the available staff, space, and products on hand when they need it. Effective resource management is an important and

necessary process for organizations to invest in because it provides numerous benefits, including cost savings, time savings, and increased customer satisfaction (Manzoor, 2020).

Control Costs

Cost control is the process of monitoring the status of the project to update any budget variation and make necessary adjustment to the cost baseline. It involves taking the cost baseline and performance data about what has been done to determine the work accomplished against the amount spent (PMBOK, 2017). Controlling project costs involves tracking and assessing cost performance, ensuring appropriate project changes are included during a revised cost baseline, and informing project stakeholders of authorized changes to the project that will impact costs. People tend to perform better when they know they need to report on their progress. Performance measurement is a crucial tool for effective cost control (Akeem, 2017).

During project implementation, it is necessary to monitor the status of the project in terms of its cost baseline. Budget will be updated with the actual costs spent. Monitoring the expenditures of funds without regard of the value of the work done has little value to the project. Thus, significant effort is required to assess the relationship between the expenditure and the actual physical work being carried out. According to Amanuel et al. (2018), contractors' cost controlling scheme gives much attention to the material cost component. However, attention should also be given to labor and equipment costs since they can significantly impact on the project just as much as the material component.

Empirical Review

Cost Scheduling and Project Performance

Williams (2020) examined the relationship between project cost scheduling and projectsuccess. The study adopted a correlational study design. Data was collected from 110 construction companies in Liberia. Questionnaires were used to collect data. Results showed that there is a significant relationship between cost scheduling and project success. The researcher recommended that project managers should exploit relevant project management training and other capacity development efforts to effectively manage project costs and schedules for success. Cudjoe (2019) investigated cost planning as a tool in monitoringconstruction projects in the government sector in the Ghana Armed Forces. The study adopteda descriptive research design. A structured questionnaire was used to collect data from 66 respondents. The results of the study showed that cost planning must correspond with the fundsavailability for the projects. Cost planning was highly ranked as an effective modern cost planning technique that enhances project delivery.

Ronoh and Cheruiyot (2020) investigated the influence of project resource scheduling on performance of residential construction projects in Nairobi City County, Kenya. A descriptive survey research design was used. The sample was 79 gated community residential construction projects. Data was collected using questionnaires. Findings showed there is a significant relationship between resource scheduling and project performance. The study concluded that effective allocation of project equipment facilitates smooth operations and successful project completion. Obegi and Kimutai's (2017) studied effects of resource scheduling on the performance of NGO projects in Nairobi City County. The target was 187 NGOs in Nairobi City County. Questionnaires were used to collect data. The results indicated that project performance was influenced by resource scheduling, as it ensured that the project was operating within the approved budget and the necessary adjustments are adopted to ensure that project managers adapt to the dynamic nature of the projects, while also ensuring that staff had the resources they need to execute their duties efficiently.

Control Costs and Project Performance

Nowamani (2018) investigated effect of cost control on the success of a construction project. The findings indicated that cost control focuses on optimizing resource usage to ensure good

value for money during the design and construction processes. This approach helps to ensure that the project stays within the allocated budget and maintains a balanced cost structure across all aspects of the building. Cost control can be effectively achieved by employing techniques such as recordkeeping, inspection of work quality, comparing actual expenditures against the approved budget, and evaluating work progress through the quantification of tasks in comparison to the bills of quantities. For a construction project to be successful, the consultants and contractors should ensure integration of design and construction in order in order to achieve project success.

Ali and Kamaruzzaman (2016) sought to identify factors that contribute to cost overrun and potential measures to overcome the problem with the focus given to construction projects in Malaysia. The results indicated that the primary factor contributing to cost overruns was inaccurate or poor estimation of the original costs.. Cost overrun is a significant challenge that can lead to serious problems in the construction industry. Cunningham (2017) investigated the challenges,approaches and techniques used by quantity surveyors to control costs during the construction phase of a building project. The study highlighted the importance of completing the design at the earliest opportunity in order to enable the quantity surveyors to check the adequacy and accuracy of the contract documents. Controlling costs during the post contract phase is a challenging task and requires the project manager to provide timely and accurate cost advice. He/she must also be able to work with the client, the contract administrator, the design team, and the contractor in order to address this challenge.

Otim et al. (2018) studied the cost control techniques used in Uganda. The study target was130 contractors involved in the construction of buildings in Kampala City. The researcher was able to identify seven commonly used cost control techniques which include; schedules budget, inspection, meetings, reports, records, monitoring & evaluations. It was noted that most project managers and contractors in Uganda find difficulty in controlling project costs due to problems associated with; delays by clients to release money, delay to make decisions, lack of materials and equipment, bad weather, overlapping activities, unclear and incomplete drawings, and general failure to control the productivity of resources. Bwankarikari and Irechukwu (2022) examined the effect of project cost control on the performance of rice projects in Rwanda.The descriptive case study research based on qualitative and quantitative approaches were used in order to get a better insight of the study. The population of the study was 74 respondents. The results showed that project managers develop accurate cost estimates and realistic project budget that leads to minimum project cost. Results also showed that there is a significant relationship between project cost control and project performance.

A study by Ngwai et al. (2019) examined the influence of project management practices on construction cost control of projects in Mombasa County. The findings of correlation analysis indicated that the project management practices had positive significant relationship with construction cost control. Kamau, Gesimba, and Gichuhi (2022) sought to establish the influence of cost control on the realization of NG-CDF projects in Kikuyu Constituency, Kiambu County, Kenya. A descriptive cross-sectional survey design was adopted. A structured questionnaire was used to collect data. Findings showed that cost control influences realization of NG-CDF projects in Kikuyu Constituency, Kiambu County, Kenya. Projects which were successfully realized were more likely to have good cost control.

RESEARCH METHODOLOGY

The study used a descriptive research design. The unit of analysis was 37 road projects managed by the Kenya Urban Roads Authority (KURA) and 14 road projects managed by theKenya National Highways Authority (KeNHA). The unit of observation consisted of the individuals involved in managing and implementing these road projects. Specifically, the respondents will include project managers, project contractors, and road engineers who were directly involved in each of the 51 road projects, resulting in a total of 153 respondents (three respondents per project). The study employed a census approach, which involves collecting data from every

member of the population, making it particularly suitable when the populationsize is manageable and under 200 (Kothari, 2004). The total sample size was therefore 153 respondents, providing a detailed and accurate representation of the road projects' performance and management practices (Mugenda & Mugenda, 2003). For this study, a structured questionnaire was employed as the primary data collection instrument. Questionnaires were coded and keyed into SPSS Version 28. Data coding involves assigning numbers or whatever other symbol so that data is grouped in smaller number of categories. Data entry enable manipulation of the entered information for various interpretations. Data analysis was conducted to generate both descriptive (frequency, percentage, mean) and inferential statistics (correlation, and regression). Significance was less than 0.05.

RESEARCH FINDINGS AND DISCUSSIONS

Out of the 138 distributed questionnaires, 126 questionnaires were filled and returned, resulting in a response rate of 91.3%. This response rate is considered excellent and acceptable for academic research,as response rates above 70% are generally regarded as robust and sufficient for making generalizations about the population (Babbie, 2010). The high response rate of 82.4% supportsthe credibility of the study findings, ensuring that the data collected are representative of the targeted population.

Descriptive Analysis

This section presents the descriptive findings from the study on the relationship between project cost management processes and the performance of road projects in Nairobi City County, Kenya. Descriptive statistics were calculated for each study variable, providing insights into respondents' levels of agreement with statements related to cost scheduling, and cost control. The analysis uses mean scores and standard deviations to interpret the level of agreement, with higher mean values indicating stronger agreement with the statements. A mean value of 1-1.4 was strongly disagree, 1.5-2.4 disagree, 2.5-3.4 neutral, 3.5-4.4 agree and 4.5-5 strongly agree.

On the other hand, a standard deviation greater than 1.5, suggests that the responses were more diverse, with a wider range of scores across the participants.

Cost Scheduling

The first objective of the study was to determine the effect of cost scheduling on the performance of road projects in Nairobi City County, Kenya. Respondents indicated their levelof agreement with various statements on cost scheduling. Table 4.1 presents summary of findings obtained.

Table 4. 1: Descriptive Analysis of Cost Scheduling

Statements	Mean	Standard Deviation
Project funds have been disbursed on time by the government and private partners	3.92	0.68
There is effective and efficient utilization of project financial resources	4.01	0.64
Project milestones are completed as scheduled	3.87	0.66
Scheduling changes are communicated promptly to stakeholders	3.94	0.70
Project timelines are realistic and achievable	4.03	0.62
Delays in cost scheduling have been minimized	3.89	0.69
Aggregate Mean	**3.94**	**0.66**

The findings show that the respondents agreed on average that project funds have been disbursed on time by the government and private partners (M= 3.92, SD= 0.68); that there is effective and efficient utilization of project financial resources (M= 4.01, SD= 0.64); and that project milestones are completed as scheduled (M= 3.87, SD= 0.66). They were further in agreement that scheduling changes are communicated promptly to stakeholders (M= 3.94, SD=0.70); project

timelines are realistic and achievable (M= 4.03, SD= 0.62); and that delays in cost scheduling have been minimized (M= 3.89, SD= 0.69).

The aggregate mean score of 3.94 suggests that respondents generally agree that cost scheduling positively impacts the performance of road projects. This aligns with Williams (2020), who found a significant relationship between cost scheduling and project success, emphasizing the importance of effective scheduling in enhancing project outcomes. Similarly, Ronoh and Cheruiyot (2020) highlighted that proper scheduling facilitates smooth project operations and timely completion, supporting the positive impact of cost scheduling on projectperformance.

Cost Control

The second objective of the study was to examine the effect of cost control on the performanceof road projects in Nairobi City County, Kenya. Respondents gave their level of agreement with various statements on cost control. Table 4.7 presents the findings obtained.

Table 4. 2: Descriptive Analysis of Cost Control

Statements	Mean	Standard Deviation
There is permanent estimation and comparison of actual expenditures with the budget	3.98	0.67
Project managers seek the opinion of a quantity surveyor	3.95	0.69
Various cost control techniques are used to control project costs	4.02	0.63
Funds transfer costs are considered during project cost planning	3.89	0.71
There is constant reporting on the project expenses	3.94	0.65
The funds transfer system is reviewed regularly to enhance transparency	3.92	0.68
Aggregate Mean	**3.95**	**0.67**

Based on the findings, respondents generally agreed that there is permanent estimation and comparison of actual expenditures with the budget (M= 3.98, SD= 0.67); that project managers seek the opinion of a quantity surveyor (M= 3.95, SD= 0.69); and that various cost control techniques are used to control project costs (M= 4.02, SD= 0.63). Respondents were also in agreement that funds transfer costs are considered during project cost planning (M= 3.89, SD= 0.71); that there is constant reporting on the project expenses (M= 3.94, SD= 0.65); and that the funds transfer system is reviewed regularly to enhance transparency (M= 3.92, SD= 0.68).The aggregate mean score of 3.95 shows that respondents generally agree on the importance of cost control in enhancing project performance. This finding aligns with Nowamani (2018), who concluded that cost control ensures resource efficiency and project success. Similarly, Cunningham (2017) highlighted the critical role of cost control techniques in managing project expenses and ensuring budget compliance.

Project Performance

The general objective of the study was to determine the effect of project cost management processes on performance of ad projects in Nairobi City County, Kenya. Respondents were asked their level of agreement with various statements to assess the performance of road projects in Nairobi City County, Kenya. Table 4.3 presents the results obtained,

Table 4. 3: Descriptive Analysis of Project Performance

Statements	Mean	Standard Deviation
Projects completed within time	3.90	0.68
Projects completed are of high quality	4.02	0.64
Project stakeholders are satisfied	3.96	0.66
Aggregate Mean	**3.96**	**0.66**

From the findings, the respondents were in agreement that projects are completed within time

(M= 3.90, SD= 0.68); that projects completed are of high quality (M= 4.02, SD= 0.64); and that project stakeholders are satisfied (M= 3.96, SD= 0.66). The aggregate mean of 3.96 indicates that respondents generally agree that road projects in Nairobi City County perform well in terms of timely completion, quality, and stakeholder satisfaction. These findings are consistent with Omollo (2019), who found that effective budgeting practices enhance project performance. Additionally, the positive impact of cost control aligns with Kamau and Nyang'au (2018), emphasizing the role of comprehensive cost management practices inachieving project success.

Correlation Analysis

This section presents the correlation analysis conducted to determine the strength and directionof the relationships between the independent variables (cost scheduling and cost control) and the dependent variable (project performance) of road projects in Nairobi City County, Kenya.The Pearson correlation coefficient (r) was used to assess these relationships, with values ranging from -1 to +1, where values closer to +1 indicate a strong positive relationship, valuescloser to -1 indicate a strong negative relationship, and values near zero suggest no relationship.Statistical significance was set at the 0.05 level ($p < 0.05$).

Table 4. 4: Correlation Matrix

Variables		Project Performance	Cost Scheduling	Cost Control
Project Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	126		
Cost Scheduling	Pearson Correlation	.721**	1	
	Sig. (2-tailed)	.000		
	N	126	126	
Cost Control	Pearson Correlation	.732**	.561	1
	Sig. (2-tailed)	.000	.073	
	N	126	126	126

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

The correlation coefficient between cost scheduling and project performance is 0.721 ($p<0.000$), indicating a strong positive relationship. This suggests that effective cost scheduling is significantly associated with improved project performance in road projects. Cost scheduling helps in defining clear timelines and resource allocation, which reduces the likelihood of project delays and cost overruns. This finding is consistent with Cudjoe (2019), who found thatproper scheduling ensures that projects align with available resources, contributing to their timely and successful completion. Moreover, Obegi and Kimutai (2017) emphasized that resource scheduling, a key aspect of cost scheduling, ensures that project resources areefficiently utilized, preventing disruptions that can negatively impact performance. The strongpositive correlation in this study underlines the critical role that well-structured scheduling plays in enhancing project execution, maintaining adherence to planned timelines, and meetingproject objectives.

Cost control showed the strongest positive relationship with project performance, with a correlation coefficient of 0.732 ($p<0.000$). This indicates that stringent cost control measuresare critically important in enhancing the performance of road projects. Effective cost control involves monitoring project expenses continuously, comparing them against the budget, and making necessary adjustments to avoid cost overruns. This study's findings are in line with those of Otim et al. (2018), who highlighted that cost control techniques such as budgeting, inspections, and financial monitoring are essential for keeping project costs in check and ensuring successful project outcomes. Bwankarikari and Irechukwu (2022) also noted that project managers who implement robust cost control practices are more likely to achieve project objectives within the planned financial constraints. The strong positive correlation in this study

emphasizes the pivotal role of cost control in maintaining financial discipline, enhancing resource efficiency, and ensuring that road projects are delivered within budget and to the expected quality standards.

Regression Analysis

Coefficients Analysis

The coefficients analysis provides insight into the specific impact of each independent variable on the dependent variable. Each sub-section below details the effect of cost scheduling, and cost control on project performance.

Table 4. 5: Regression Coefficients for Study Variables

Variable	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
(Constant)	1.045	0.122		8.566	0.000
Cost Scheduling	0.294	0.061	0.317	4.820	0.000
Cost Control	0.301	0.060	0.326	5.017	0.000

The regression equation derived from the analysis is expressed as follows: Project Performance= 1.045 + 0.294(Cost Scheduling) + 0.301 (Cost Control)

The coefficient for cost scheduling is 0.294, with a significant p-value of 0.000. This indicates that cost scheduling has a positive and significant effect on project performance, meaning thata one-unit improvement in cost scheduling effectiveness is associated with a 0.294 unit increasein project performance. This finding supports the work of Ronoh and Cheruiyot (2020), who demonstrated that effective scheduling enhances project operations and ensures timely project completion, contributing to overall project success.

Cost control has the highest impact among the variables, with a coefficient of 0.301 and a p-value of 0.000. This suggests that stringent cost control practices are critical for enhancing project performance, with every unit increase in cost control effectiveness contributing to a

0.301unit improvement in project performance. This result shows that enhancing cost control measures significantly boosts project outcomes, aligning with the findings of Nowamani (2018), who emphasized that effective cost control is critical for maintaining project budgets and achieving project goals. Otim et al. (2018) also found that robust cost control practices, such as financial monitoring and regular cost comparisons, are essential for preventing budgetoverruns and ensuring project success.

Conclusions

The study concludes that cost scheduling significantly impacts the performance of road projects. Effective scheduling practices, such as timely disbursement of funds, realistic timelines, and prompt communication of changes, contribute to improved project performance. This supports the notion that cost scheduling is a vital component of project management that enhances operational efficiency and project success.

The study concludes that cost control has the most substantial impact on project performance among the cost management processes examined. Effective cost control measures, including continuous monitoring, reporting, and financial discipline, are essential for maintaining project budgets and achieving project goals. The findings emphasize the need for stringent cost control practices in managing road projects.

Recommendations

Cost Scheduling

It is recommended that project managers and implementing agencies enhance cost scheduling practices by adopting advanced scheduling tools and techniques. Regular reviews of project

schedules should be conducted to ensure timelines remain realistic and achievable. The government and private partners should prioritize timely disbursement of funds to avoid delays that could impact project progress. Training and capacity-building initiatives should be implemented to equip project managers with the skills needed to manage cost scheduling effectively.

Cost Control

Strengthening cost control measures is critical for enhancing project performance. Project managers should regularly review expenditures against the budget and use various cost control techniques to keep projects on track financially. Reporting on project expenses should be consistent and transparent to maintain financial discipline. The implementation of robust financial monitoring systems can help detect and address cost deviations promptly, ensuring that projects are delivered within budget.

Suggestions for Further Studies

Future research should explore the impact of external factors, such as regulatory frameworks and economic conditions, on the effectiveness of project cost management processes. Additionally, studies could investigate the role of technology in enhancing cost management practices in road projects. Expanding the scope of research to include other types of infrastructure projects could provide a broader understanding of cost management across different sectors.

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