

PROJECT COST PLANNING AND PERFORMANCE OF HOUSING PROJECTS IN KENYA

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ABSTRACT

This study sought to determine the influence of project cost planning on the performance of housing projects in Kenya. This study adopted a descriptive research design. The target population was 675 building construction stakeholders; Project Managers, Engineers, Architects, contractors, and site supervisors drawn from 135 housing projects within Nairobi Metropolitan. The study made use of primary and secondary data. Structured questionnaires and Interviews were used to collect both quantitative and qualitative data. Pilot testing was done to test the validity and reliability of the research instrument. The Data was analyzed using the Statistical Package for Social Sciences (SPSS); descriptive statistics mainly percentages, frequencies, means & standard deviations and inferential statistics mainly the regression analysis. The descriptive results showed that project cost planning

influenced the performance of housing projects in Kenya. The study concluded that, project cost planning is important in the performance of housing projects in Kenya. This is because cost planning allows accurate budget estimation, informed decision making, efficient resource allocation, cost control, risk management, and effective stakeholder management. By having a well-planned cost structure, construction of housing projects can be executed within budget, avoid financial risks, and achieve desired outcomes. The study recommended that Policy on cost management should be adopted which encourages the use of standardized cost management tools and require regular cost reporting to monitor and manage project expenditures. These guidelines are for effective cost estimation, budgeting, and control for housing projects.

Key words: Project Cost planning, Housing projects, Performance

INTRODUCTION

Infrastructure development projects like housing, roads, airports, bridges among others are complex endeavors that often involve substantial budgets, multiple stakeholders and varying durations, ranging from a few years to several (Evans & Farrell, 2022). Across the spectrum of construction projects, certain universal constraints persist, including time, cost, and quality. Delays are a common challenge encountered in the course of construction projects (Acolin & Green, 2017). Cunningham, (2017) investigated Cost Control during the construction phase of the Building Projects in England and found that achieving satisfactory cost control requires an effective cost plan which takes account of the nature and complexity of the project and exploits the ability of the project manager to control the process. He also asserts that the key objective of a project cost plan is to set out an individual's or a company's goals and to design how these goals can be best achieved. In Malaysia, public projects face cost overrun with an average amount ranging from 6% to 12% of the contract budget. There are five essential elements employed to manage projects in Malaysia; time management, cost reduction, environmental sustainability and improvement in public health and safety (Waqar & Pomares, 2023). In Tanzania, Ndunguru, Niyonyungu, and Yang (2020) investigated the measurement of the

impact of various factors contributing to delays and cost overruns in construction projects within Tanzania. Their findings revealed that construction projects in often-experienced frequent delays and disruptions, leading to conflicts related to both time and cost overruns, substantial periods of inactivity, and adverse social consequences.

Construction of housing projects in Kenya is crucial for addressing the growing housing needs of the population. Housing and urban development are addressed in the social pillar of Vision 2030, which focuses on social equity, human development, and social inclusion. Improving effectiveness and efficiency in all levels of planning, contracting and implementation of the housing and infrastructural projects is one of the goals of vision 2030 (GOK, 2018). Housing contributed approximately 5.2 percent of gross domestic product (GDP) in the third quarter of 2022 (Kenya National Bureau of Statistics, 2020). However, despite their significance, there is a pressing issue regarding the planning and performance of these projects (Tuyishime & Nyambane, 2021).

Kenyan housing sector is still characterized by unaffordable housing supply, low levels of urban homeownership of about 16 percent, and proliferation of inappropriate dwelling units like slums (Giti, K'Akumu, & Ondieki, 2020). Currently it has been estimated that 250,000 housing units are required annually, but only an estimated 50,000 are produced, of which 6,000 or 12 percent are dedicated to low-income urban households. This inadequate supply of low-income urban housing is due to lack of housing infrastructure and low investment by stakeholders, hence need for a paradigm shift in developing low-income urban housing (Njogu, Namusonge, & Oluoch, 2018).

Project cost planning is vital because inaccurate cost estimates can ultimately lead to unrealistic project plans that cannot be executed within established constraints, potentially necessitating feasibility reassessment, re-planning, or even project cancellation, with significant consequences for all parties involved (Hassan & Guyo, 2017). Housing Construction Projects in many parts of Kenya are faced with several challenges due to delays, cost overrun, poor quality, and the rampant collapsing of structures as witnessed in the recent past (Mwangi & Ngugi, 2020). Affordable housing projects in the Nairobi metropolis are constructed through the use of improper time-frames, poor materials, as well as inadequate planning affecting the overall quality of the projects (Momanyi & Sang, 2019; Ndungu, 2017). Successful execution of projects and keeping them on time and within budget as well as quality depends on effective planning and scheduling right from the beginning (Achar, Chebii, & Nugo, 2021). The performance of housing construction projects in Kenya is poor as a result of inadequate planning as most projects experience time delays and cost overrun as well as quality issues (Ronoh, 2020)

Statement of the problem

Timely and effective completion of construction projects has become essential for both government and commercial achievements. Nevertheless, encountering delays and cost overrun in infrastructure construction stands out as the costly, recurring, risky, and intricate

challenges that come with project completion (Toole & Chinowsky, 2017). Construction projects are notorious for their high failure rates, often characterized by budget overruns and delays in completion. According to Aljohani & Moore, (2017) nearly ninety percent of construction projects experience cost overruns

Project failures have substantial effect from economic, social and political points of view. When projects take extra time to be completed, it calls for additional resources; labor, material, machinery and equipment cost, increasing budgets (Ondiek 2018). The housing construction sector suffers from inadequate project cost planning, resulting in 48% of projects exceeding the budget and 87% experiencing time overruns, with only 13% of projects completed on time (Ikram & Michele, 2020)

Kinyumu & Mungai, (2022) found that cost is the major contributor to the poor performance of bank-financed projects in Kenya. Wabwile & Ruguru, (2023) found that Project Cost management do have a positive and significant effect on the implementation of low-cost housing projects in Nairobi City County, Kenya. Project cost planning is very vital and influences all parts in both planning and implementation of a project (Momanyi & Kamau, 2020). It is key to keep track of total costs as well as costs for different work packages in a project (Omeno & Sang, 2018). This study therefore seeks to examine the influence of Project cost planning on the performance of housing projects in Kenya.

Research Objective:

The specific objective was to examine the influence of project cost planning on the performance of housing projects in Kenya.

LITERATURE REVIEW

Theoretical Review

The study was grounded on the Resource based theory (RBV), which was formulated by Wernerfelt, (1984) and subsequently expanded upon by other scholars. It underscores the influence of both tangible and intangible assets on an organization's performance (Cunningham, 2017). This theory outlines the principal importance of internal resources within an organization and how these resources are utilized to develop strategies that lead to competitive advantages sustainable in the organization's markets (Kamau, 2020). According to the Resource-Based View (RBV), an organization's internal capabilities play a fundamental role in determining its key decisions and strategic positioning in the external environment for a competitive advantage. This aligns with the impact that project-planning practices can have on a firm's performance (Momanyi & Sang, 2019). In the context of infrastructural construction, the RBV theory is utilized to identify and explore the importance of expertise in manpower and effective project planning systems (Omondi, 2017). These elements assist construction industry in managing their current projects efficiently and positioning themselves to seize future business opportunities, thereby enhancing their portfolio. Over time, resources,

knowledge, and capabilities, accumulated by a firm provide avenues for future business exploration, giving the firm a competitive edge over rivals (Cartlidge, 2017). In the building and construction industry, these resources and capabilities may encompass a range of assets, including plant and machinery, cost and financing models, planning and scheduling templates professional consultants, knowledgeable workers, and certified organizational processes and best practices (Gitonga, 2022).

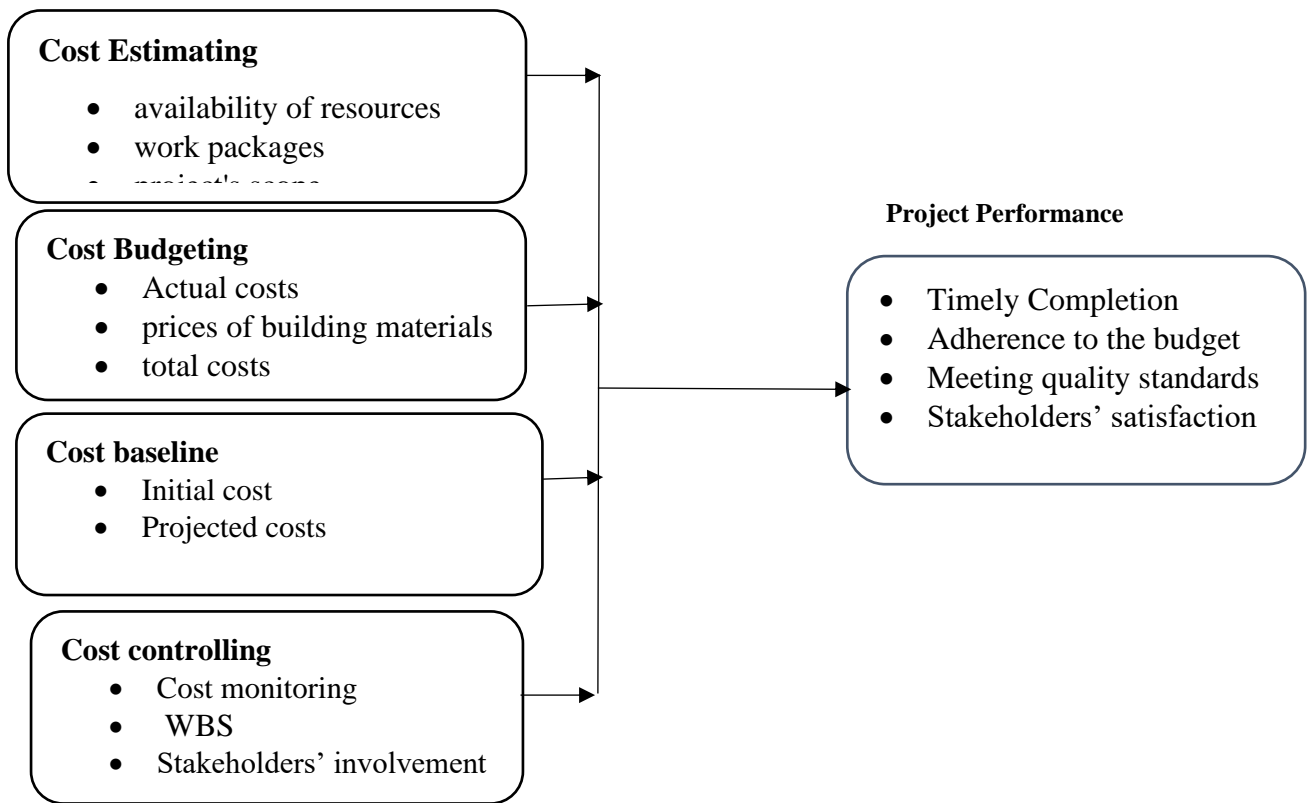
Cartlidge, (2017) opines into the notion that investments in resources and capabilities are strategic choices made in an uncertain context, and the combination of these factors can create potentially valuable real options. Resources refer to inputs used in a firm's production processes, which can be either tangible or intangible, such as capital, employee skills, equipment, patents, skilled managers and financial assets. As an organization's resource set becomes more effective, its expansion is notable.

Project cost planning in the context of construction, represents a professional capability and expertise in planning, and analyzing potential risks and controlling project costs, which could lead to cost overruns (Khisu & Mutuku, 2023). Cost management is the process of monitoring expenses at every stage of a construction project, from feasibility assessment to project handover, ensuring that the cost plan remains on track (Gitonga, 2022). Project cost planning is vital because inaccurate cost estimates can ultimately lead to unrealistic project plans that cannot be executed within established constraints, potentially necessitating feasibility reassessment, re-planning, or even project cancellation, with significant consequences for all parties involved (Hassan & Guyo, 2017). According to PMI, (2019) cost management is one of the three essential activities within the cost management function. Despite the variety of approaches and computer tools available, cost estimating remains to some extent an art that relies on a clear project definition and the selection of an appropriate estimating method (Wabwile & Ruguru, 2023)The resource-based theory acknowledges the existence of cost factors and resources, thereby guiding proper planning to ensure the efficient allocation and utilization of resources toward achieving project objectives.

Conceptual Framework

Conceptual framework is an intermediary theory in a diagram form that strives to connect the study variables. It offers a logical structure of connected concepts that help provide a map or visual display of how ideas in a study relate to one another (Osanloo & Grant, 2016). Mugenda (2008) states that the predictor variables or independent variables predicts the amount of variance that exists in another variable, while the dependent variable, also known as the criterion variable, is a variable that another variable affects or changes. The variable that the researcher wants to explain is the dependent variable. Therefore, this study sought out to examine the influence of project cost planning on the performance of housing projects in Kenya. The variables in the conceptual framework in Figure 2.1 were derived from the theories identified and literature from different scholars in this study.

Project Cost Planning



Independent Variables

Dependent Variable

Figure 2. 1 Conceptual framework

Project cost planning

Project cost planning gives the road map to the estimation of costs, the setting of an agreed budget, and management of actual and forecast costs against that budget (PMI, 2017) Project cost planning is one of the project management knowledge areas which includes the processes of estimating and budgeting cost (Manzoor, 2019). The objective of a project cost plan is to set out an individual's or a company's goals and to design how these goals can be best achieved (Oroni, Ngacha, & Wabwire, 2023). Gitonga (2022) agrees that Project cost planning is one of the project management knowledge areas, which includes the processes of estimating and budgeting cost. He concluded that that better estimation of cost, well-identified risk, and including quality planning during planning processes results to complete the project on time and budgeted cost. Munyua & Lango (2023) agreed that a cost management plan is developed for every project to describe how the project portfolio is managed and facilitated. Kinyumu & Mungai, (2022) found that cost is the major contributor to the poor performance of bank-financed projects in Kenya. The study recommended that project managers working on the bank financed projects should improve their cost management skills Poor cost planning may

arise due to improper financial plans made in the initial project document which may result in stalling of construction until intervention by financiers come through.

Wabwile & Ruguru, (2023) found that Project Cost management do have a positive and significant effect on the implementation of low-cost housing projects in Nairobi City County, Kenya. The project managers should have experience and skills as well as tools to assist them manage projects cost. Proper monitoring and control through stakeholder's involvement, of resources must be put in place for successful implementation of project.

Omeno and Sang (2018) argue that estimating cost is the procedure that ensures all tasks are included in determining the financial resources required to ensure the project activities are completed. Oroni, Ngacha, & Wabwire, (2023) defines cost estimating as a procedure whereby the estimator comes up with an expenditure of resources adequate to ensure the project is completed as per the stakeholders' specifications and plans. The estimation of the project cost is determined by several variables including the availability of resources, work packages such as labour rates, and controlling or mitigating factors that generate cost variances (Manzoor, 2019). Muute (2019) opines that cost estimation should be based on the project's scope and linked to the project plan. According to Njang'iru, Muhoho & Abayo, (2020) cost estimating is a dire component of a construction agreement. They opined that the impact of improper cost estimate on contracting concern is significant; overestimation or underestimation can create a severe consequence and can thwart the opportunity of a contractor in a construction contract. Project managers should ensure effective cost estimating to avoid quality issues in projects (Wabwile & Ruguru, 2023). The cost estimation should be based on the project scope, the WBS and be connected to the project plan (Koome, 2020).

Kogi & Were (2019) purports that budgeting or determination of budget is the other major component of project cost planning. This process refers to the aggregation of individual project task budgets into an overall project budget (Barmasai & Mbugua, 2020). The base budget is subdivided into two parts: the main one is the baseline. The baseline is the available sum that can be used to carry out the activities relative to the project. It is so-called because its evolution in time can be depicted as a line (Arabiyat & Al-Momani, 2020). The project management plan uses a cost baseline to compare planned expectations compared to the actual costs. It also uses the cost management plan to identify the acceptable variances of cost performance (Muute, 2019).

Project Performance

The housing projects performance can be assessed using numerous performance indicators that could be related to the following proportions: cost, time, client satisfaction, quality, health, and safety (Muute, 2019). Performance can be defined as the achievement of predetermined goals during the execution of a project, task, or activity, measured against established standards. Hassan & Omwenga, (2023) characterized performance as an organization's ability to fulfill its stated objectives with limited resources, often assessed in terms of efficiency and effectiveness. Regarding housing projects, Kimotho (2023) noted that it involves assessing factors such as

aesthetics, convenience, reliability, amenities, durability, and adherence to design specifications.

The major performance measures applied by developers to examine the performance of affordable housing projects including quality, cost, and time (Abdi & Sang, 2020; Akwale & Yusuf, 2023; Hassan & Omwenga, 2023). Performance is the accomplishment of a given task, or a project measured against preset known standards of accuracy, completeness, cost, and speed (Barmasai & Mbugua, 2020). Project performance majorly measured by time, cost, and quality are influenced by success variables such as project team performance Project characteristics, procurement system, contractor characteristics, client characteristics, contractor characteristics, design team characteristics, and external condition (Kemuma & Lango, 2023). Mwangi & Ngugi, (2020) argues that to determine the performance of the public project in Kenya, focus on; completion of the project on time, Project being completed on budgeted cost, the general satisfaction on the project performance, and if the Project scope was fully achieved. Cost is a vital performance metric, and it has long been a key aspect of defining project success (Acolin & Green, 2017). The performance of the Affordable housing project is the major concern of the stakeholders and hence adequate planning is considered as the major aspect in achieving it (Yang, Yu, & Zhu 2020).

Empirical Review

Maeri, Iravo, & Muchelule, (2022) conducted a research on project management tripple constraints and how they influence performance of affordable housing in Kenya. The specific objectives of the study were; to investigate project resource management and the moderating effect of community engagement effect on affordable housing project. A random sampling was used to pick a sample of 303 out of a population of 24,000 social housing units. The study found that project cost management and scope management significantly influenced the performance of affordable housing projects. Project cost planning in the study cut across various factors of contract management, materials, supplies and transport issues.

Wabwile & Ruguru (2023) studied on Project Planning Management Practice and Implementation of Low-Cost Housing Projects in Nairobi County. The specific objective examined was the influence of project cost management on the implementation of low-cost housing projects in Nairobi City County, Kenya. The study employed a descriptive research design, targeting the 152 project managers. Data was collected using structured questionnaires and later analyst using descriptive and inferential statistics. The study found a positive relationship between project cost planning on implementation of low-cost housing projects in Nairobi City County, Kenya. The study recommends that project managers should check effective cost estimating, cost budgeting and cost control.

Ondiek, (2020) conducted a study and revealed that project cost planning has a positive correlation with the performance of construction projects. Woldie, (2016) in his study identified the better estimation of project cost results to completion of project within the estimated time and budget. Aslam, et al (2019) also found that the predominant factors of cost

overrun are a result of design changes. Hassan, et al., (2019), found that lack of proper planning regarding cost estimation may sometimes lead to overestimation or underestimation, thus resulting in the delay of building projects or incompleteness of the task. In their study on the influence of project management skills on the performance of the bank-financed project in Kenya, Lugusa and Moronge (2016) found that cost, risk, time, and quality management skills are the major contributors to poor performance of projects. Okotchi, Makokha, & Namusonge, (2020) in their study on effects of budgetary process on performance of county governments, a case of Trans Nzoia County Government found that participation in the budgetary process, budgetary control and budgetary planning enhances project financial performance.

RESEARCH METHODOLOGY

This study adopted a descriptive research design. The target population was 675 building construction stakeholders; Project Managers, Engineers, Architects, contractors, and site supervisors drawn from 135 housing projects within Nairobi Metropolitan. The study made use of primary and secondary data. Structured questionnaires and Interviews were used to collect both quantitative and qualitative data. Pilot testing was done to test the validity and reliability of the research instrument. The Data was analyzed using the Statistical Package for Social Sciences (SPSS); descriptive statistics mainly percentages, frequencies, means & standard deviations and inferential statistics mainly the regression analysis.

RESEARCH FINDINGS

The study selected a sample of 251 project strategic partners registered to undertake projects for the affordable housing projects in Kenya. In the survey carried out 251 questionnaires were supplied to the respondents, 220 questionnaires were correctly filled and surrendered back. The returned questionnaires formed a response rate of 87.65%

Descriptives

The study attempts to establish the influence of project cost planning on the performance of affordable housing projects in Kenya. The statements of opinions required from the respondents on a Likert scale ranged from Strongly Disagree (SD), Disagree (D), neither agree nor disagree (NAD), Agree (A) and Strongly Agree (SA). The results are tabulated in means and standard Deviation (Std. D). The Table 1 summarizes the influence of project team planning on the performance of housing projects.

From the findings it is clear that cost management plan, prices, appropriate project changes, cost estimates, labour resources and project cost plan are the main aspects of Project cost planning that influence performance of affordable housing projects in Kenya. Project cost planning according to Momanyi & Kamau, (2020) is very vital and influences all parts in both planning and implementation of a project.

Table 1: Project Cost Planning

Statements	Mean	Std. D
In every project, developing a cost management plan that describes how cost variances will be managed on the project makes it successful	4.09	1.078
Fluctuations in labour, material and technology prices influence the overall cost of the project.	4.28	1.296
To ensure projects succeeds only appropriate project changes are included in a revised cost baseline	4.64	.869
To ensure project success, we conduct cost estimate of the costs of the resources needed to complete project activities	3.49	1.060
Conducting cost estimates of the resources needed to complete project activities ensures project success and performance	3.57	.940
Identifying situations where project labor resources are being used on multiple projects ensures smooth flow of the project and its success	4.24	1.041
Developing a project cost plan is one of the important control instruments which helps in measurement of whether the project has reached its goal	4.37	1.151

From the findings, majority of the respondents agreed that developing a cost management plan that describes how cost variances are managed on the project makes it successful (M=4.28; St. D=1.296). Majority of the respondents strongly agreed that the fluctuations in labour, material and technology prices influences the overall cost of the project (M=4.64; StD=0.869). On whether projects succeeds only when appropriate project changes are included in a revised cost baseline, majority also strongly agreed (M=4.64; StD=0.869). On cost estimate, majority of the respondents (M=3.57; St. D=0.940) agreed that conducting cost estimates of the resources needed to complete project activities ensure project success and performance. On Identifying situations where project labor resources are being used on multiple projects, majority 47.4 % of the respondent agreed that Identifying situations where project labor resources are being used on multiple projects ensures smooth flow of the project and its success, 5.2 % strongly agreed, 21.3 % disagreed, 6.1 % strongly disagreed, while 20 % neither nor agreed with the statement (M=4.24; St. D=1.041). To project cost plan, most 37.0 % of the respondent strongly agreed that developing a project cost plan is one of the most important control instruments which helps in measurement of whether the project has reached its goal or not. 7.0 % strongly disagreed, 22.6 % were neutral while 17.8 % disagreed with the statement (M=4.37; St. D=1.151). From the findings it is clear that cost management plan, prices, appropriate project changes, cost estimates, labour resources and project cost plan are the main aspects of Project cost planning that influence performance of affordable housing projects in Kenya. Project cost planning according to Momanyi & Kamau, (2020) is very vital and influences all parts in both planning and implementation of a project.

Correlation Analysis of Study Variables

The research established interconnectivity the variable under study namely: Project cost planning and Project performance. To compute the correlation (strength) between these study variables and their findings the researcher used the Karl Pearson’s coefficient of correlation (r) as shown by the table 2

Table 2: Correlation Matrix

Variables		Project Performance	Project Cost planning
Project performance	Pearson Correlation	1	
	Sig. (2-tailed)	0.000	
	N	220	
Project Cost planning	Pearson Correlation	.410**	1
	Sig. (2 tailed)	0.000	0.000
	N	220	220

Project cost planning was also seen to have a moderate positive and significant relationship with performance of housing projects at (r=0.410, p=0.000), and since the p-value obtained (0.000) was less than the selected level of significance (0.05), the study concluded that the relationship between the two variables was significant. This concurs with the findings of Ondiek, (2020) that project cost planning has a positive correlation with the performance of construction projects.

Multiple Regression Results

The study computed a multiple regression analysis to establish the relationship between project cost planning and performance of housing projects in Kenya. The independent variable t studied, explained only 31.2 percent of the performance of housing project as represented by the adjusted R². This therefore means that other factors not studied in this research contribute 69.8 percent to the performance of housing project.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.443 ^a	.315	.312	.35309

a. Predictors: (Constant), Project cost planning

Conclusion

The study found that project cost planning influences the performance of housing projects. The study also established that developing a cost management plan that describes how cost

variances are managed on the project makes it successful. The respondents agreed that the fluctuations in labour, material and technology prices influences the overall cost of the project. Identifying situations where project labor resources are being used on multiple projects ensures smooth flow of the project and its success. Establishment of cost baseline plays a key role in monitoring and control of resources. The study found that projects succeeds when appropriate project changes are included in a revised cost baseline and also the overall cost estimate to individual work items to establish a baseline for measuring performance of project is key.

Better estimation of cost, well-identified risk, and including quality planning during planning processes results to complete the project on time and budgeted cost. In every housing project there is need to develop a cost management plan that describes how variances cost is monitored on the project to ensure proper performance which meets the stakeholders, expectations.

Recommendations

The study suggests that in order to effectively plan project costs, it is crucial to recognize the significance of the project budget, as it impacts all aspects of project planning and implementation. It is advisable to monitor both the overall project costs and the costs associated with individual work packages within the project.

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