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Influence of Performance Metrics on Project Implementation by Construction Companies in Nakuru Town East Sub-County

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ABSTRACT : Project implementation is the stage where all planned activities are put into action, the project is produced and the performance capabilities are verified. A project is generally considered to be successfully implemented if it comes in on-schedule, comes in on- budget and achieves basically all the goals originally set for it and is accepted and used by the clients for whom it is intended .The study was carried in Nakuru Town East Sub-County to determine the influence of Project cycle time, Project cost, Project quality and Project safety on project implementation . The study used descriptive survey design. The population consisted of 76 engineers, and 28 project managers. Census design was used. Primary data was collected using closed-ended questionnaires .The findings revealed that most of the projects are not delivered on time. Also, it emerged from the results that engineers, architect and project managers foresee possible future cost implication of a project. The results revealed that construction material and components are according to specification. Also, there are no plans for managing unforeseen projects risks which are in place. There are safer working conditions. The study recommends that; Construction companies should do proper planning and scheduling which should be detailed and easy to understand. They should also ensure that time estimated for the project is not exceeded and they should make sure that their projects satisfy the owner needs. Companies should ensure that they take all the necessary precautions so as to avoid construction cost overruns.

Keywords – *Cost, Construction, Implementation, Project, Metrics, Time*

I.INTRODUCTION

1.1 Background

Project implementation success is usually difficult and complex and appears to be one of the most difficult aspects of a manager's job (Boles, D.,2012). It is a stage in project management that involves putting funds into real work (Slevin & Pinto, 2017). The need to improve performance in Construction industries worldwide has become topical. For example, the UK construction industry introduced several calls in this regard. (Samson &Lema,2002 and Egan 2012) . In the US Construction industry, rework (defect) contributes significantly to cost performance problems and accounts for an average of 5% of the total Construction cost (Hwang et al., 2009;). In Saudi Arabia, a few previous efforts have been done to identify indicators that can be used to measure the performance of Construction projects(Adebaye, 2012). Iyer & Tha, (2005) stated that 40% of Construction projects face performance problems of time overruns

Indications of poor performance in terms of cost overruns, time overruns, poor quality of work, low productivity among other problems are full in the Nigerian Construction industry literature (Tunji-Olayeni et al., 2012).

According to the Central Bureau of Statistics, the Construction industry in Kenya contributes 7 percent of the gross domestic product (GDP). Similar to the case with other developing countries, the Kenyan Construction industry shares many of the problems and challenges the industry is facing in other developing countries, perhaps with greater severity. Given the critical role the Construction industry plays in Kenya and other developing countries, and the poor level of performance of the industry in those countries, improving the performance of the industry ought to be a priority action. As contractors are one of the key players in the industry and the makers of the final product, any development and improvement initiatives in the industry has to consider ways of improving the capacity and capability of the contractors(Adams etal., (2014)

1.2 Statement of the Problem

The obligation of achieving success in the implementation of a construction project is largely dependant on the contractor's performance. Though, it has become a universal tendency that contractors are not performing to expectations of the clients that they serve and indeed many contractors have failed in performance, structures and ineffective leadership. Many researchers and studies (Samson and Lema, 2012; Iyer and Jha, 2015;)have shown that the failure of any project is mainly related to the problems and failure in performance. Despite the construction industry's significant contribution to the economy of developing countries and the critical role it plays in those countries' development, the performance of the industry still remains generally low. Adeyemi and Idoko, (2008) noted that many projects in developing countries encounter considerable time and cost overruns, failure to realize their intended benefit or even totally terminated and abandoned before or after their completion. Similar to the case with other developing countries, the Kenyan construction industry shares many of the problems and challenges the industry is facing in other developing countries, perhaps with greater severity. Given the critical role the construction industry plays in Kenya and other developing countries, and the poor level of performance of the industry in those countries, improving the performance of the industry ought to be a priority action (Nyika ,2012). In Nakuru East Sub-county, there are many construction projects which are failing in performance. In addition, performance measurement systems are not effective or efficient to overcome such problem. In the recent past there has been many projects which are finished with poor performance because of many evidential reasons such as: obstacles by client, non-availability of materials, roads closure, amendment of the design and drawing, additional works, waiting the decision, handing over, variation order, amendments in Bill of Quantity and delay of receiving drawings (OAG,2016).In addition there are other indicators of performance construction projects in Nakuru East subcounty such as project managers, coordination between participants, monitoring, feedback and leadership skills. Therefore, this study sought to evaluate the influence of performance metrics on project implementation by construction companies in Nakuru East sub-county.

1.3 Research Hypothesis

1.Project cycle time has no significant influence on project implementation in Nakuru Town East Sub-County.

2. Project cost has no significant influence on project implementation in Nakuru Town East Sub-County**.**

II. LITERATURE REVIEW

2.1 Project Cycle Time

It is imperative for Construction projects to be completed on time, as the clients, users, stakeholders and the general public usually looks at project success from the macro view where their first measure for project success seems to be the completion time (Lim and Mohamed, 2013). Salter and Torbett (2013) revealed that time variance is one of the procedures for assessing project performance in Construction projects. The component of time could specify to managers that the project was not running as smoothly as scheduled. Moreover, Latham Report in 2014 advised that ensuring timely delivery of projects is one of the vital needs of clients of the Construction industry. Project time can be viewed as the elapsed period from the commencement of site works to the completion and handover of a building to the client. The Construction time of a building is usually specified before the commencement of construction. Project time can also be deduced from the client's brief or derived by the Project planner from available project information.

Time is money to owners, builders, and users of the constructed facility. From the owner's perspective there is lost revenue by not receiving return on investment, cash flow crunch, potential alienation and loss of clients/tenants, extended interest payments, and negative marketing impacts. From the users' perspective, there are financial implications similar to owners (Odeh and Battaineh,2012).

Contractors' management capability as shown by Aje, Odusami and Ogunsemi (2009) has significant impact on cost and time performance of building projects. Wiguna and Scott (2015) showed the critical risks affecting both project time and cost perceived by the building contractors were similar. They were: high inflation/increased material price, design change by owner, defective design, weather conditions, delayed payments on contracts and defective construction work. With respect to time delays the most significant contributing factor for global projects was late delay in payments while for the stadia projects design-related factors caused the most delays (Baloyi & Bekker, 2011).Iyagba, Odusami., &Omirin (2013)identified the factors that contribute substantial detrimental effect to project performance, thus affecting the integrity of the construction industry. Time performance is very important for construction projects to be completed on time, as the clients, users, stakeholders and the general public usually looks at project success from the macro view where their first criterion for project success appeared to be the completion time (Lim and Mohamed, 2013).

2.4.2 Project cost

Cost is defined as the degree to which the general conditions promote the completion of a project within the estimated budget (Bushtit and Almohawis, 2014). Salter and Torbett (2013) indicated that cost variance was the most common technique used to measure design performance. It is not only confined to the tender sum, but the overall cost that a project incurs from inception to completion, which includes any costs arise from variations,

modification during construction period and the cost arising from the legal claims, such as litigation and arbitration. It can be measured in terms of unit cost, percentage of net variation over final cost (Chan and Tam, 2000). Cost variance is a very important factor in measuring project performance because it indicates how much the project is over or under budget. Andi and Minato (2013) used cost variance to measure project performance caused by defective design in Japan's construction s industry. Similarly, Georgy et al (2015) recommended the element of cost to measure the performance of engineering projects.

In his argument Curt (2015) argued that the cost management system tracks currents pending and commitments and predicts ultimate cost outcome. Yafiah (2013) indicate that procurement selection criteria of cost, time, quality, project characteristics and external environmental factors have effects on project performance. Fetene (2013) found that the most common effects of cost overrun were delay, supplementary agreement, adversarial relations among stakeholders, and budget shortfall of project owners which guides efforts to improve the performance of the construction industry in the future.

In their study, Azis, Ade, Memon, Aftab, Rahman, Ismail, Karim & Ahmad. (2013). (2013) stated that fluctuation in price of material, cash flow and financial difficulties faced by contractors, shortage of site workers, lack of communication between parties, incorrect planning and scheduling by contractors are most severe factors while frequent design changes and owner interference are least affecting factors on Project cost performance. Baloyi and Bekker (2011) discovered from the analysis that factors such as contractor's inexperience, inadequate planning, Inflation, incessant variation order, and change in project design were critical to causing cost overrun, while project complexity, shortening of project period and fraudulent practices are also responsible.

The increase in material cost was discovered by Baloyi and Bekker (2011) to be the single largest contributor to cost overruns for both global and stadia projects. Mrema and Mhando (2015) found that in most cases, malignancy of clients to assume roles of their consultants through making decisions and changes that affect the design and the project cost has undermined the efforts to attain the intended goals. Shaban (2013) stated that the most important factors affecting the performance of construction projects agreed by the owners, consultants and contractors were: average delay because of closures and materials shortage; availability of resources as planned through project duration; leadership skills for project manager; escalation of material prices; availability of personals with high experience and qualification; and quality of equipment and raw materials in project.

III. RESEARCH METHODOLOGY

The study adopted descriptive survey design. The study used 25 construction companies in Nakuru Town East Subcounty. The target population for the study constituted of 76 engineers, and 28 project managers. Primary data was collected using closed-ended questionnaires. Since the target population was fairly small census approach was undertaken.

Data processing was done through the editing, coding, classification and tabulation. Data was entered and analyzed using SPSS version 25 statistical software. The extracted data was quantitative in nature and was presented in tables due to ease of interpretation of information presented. Both descriptive and inferential statistics were analyzed. Descriptive statistics composed of means and standard deviations while inferential statistics was examined using linear correlation and multiple linear regressions

IV. FINDINGS

4.1 Response Rate

Table 1: Response Rate

	Frequency	Percent
Expected Responses	104	100.0
Received Responses	97	93.26
Un-received Responses	7	6.74
Total	97	100.0

Concerning this study, a total of 104 respondents were issued with questionnaires. However, 7 either failed to cooperate or filled the questionnaires without abiding with prerequisite instructions. As such, a total of 97 questionnaires were successfully and duly returned. This represented 93.26 % response rate.

4.2 Descriptive Analysis

4.2.1 Descriptive Analysis for Project Cycle Time.

Table 2: Project Cycle Time

	N	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean	Std. Dev.
Project is completed on time.	97	18.6	19.6	10.3	26.8	24.7	2.804	1.476
There is an average delay in claim approval and payment approval from owner to company.	97	23.7	24.7	20.6	16.5	14.5	3.268	1.373
Project schedules are detailed and easy to understand	97	15.5	16.5	4.1	33.0	30.9	2.526	1.466
Planned time for Project is suitable for practically implementation of project.	97	14.4	12.4	18.6	30.9	23.7	3.330	1.432
There is enough time to implement variation orders	97	19.6	21.6	6.2	32.0	20.6	2.886	1.467
There is improved transition into the different project stages or phases.	97	22.7	29.9	16.5	20.6	10.3	3.340	1.425
Unforeseen physical and weather conditions have been considered in project schedule.	97	20.6	21.6	6.2	28.9	22.7	2.887	1.450
	97							
Reports and documentation were prepared within the time given	97	19.6	14.4	13.4	25.8	26.8	2.742	1.489

According to the descriptive statistics shown in Table 4.4, it is evident that most of the respondents at 51.5 % disputed that construction projects are delivered on time. On average, respondents strongly concurred with this assertion (mean = 2.80) and also exhibited significant variation in their views (std dev = 1.476). It was further revealed that 48.4 % of the respondents believed that claim approval and payment approval from owner to company is average. It was generally concurred in respect of this proposition with diverse variation in opinion (mean = 3.268; std dev =1.373). The study also revealed that 63.9% of the respondents surveyed disagreed that the projects scheduled are detailed and easy to understand. On average, the respondents were in concurrence regarding this assertion (mean = 2.526) and also their views were largely diverse (std dev = 1.392). Although, generally most of the respondents disputed that the time planned for project is suitable for practically its implementation. (mean = 3.443) and also the views in this respect were diverse (std dev = 1.412), there was a number of respondents (26.8%) who agreed with this opinion. Moreover, the study found that 52.6 % of the sampled respondents agreed that they were enough time to implement variation orders. However, in spite of the respondents generally concurring with this statement (mean = 3.76), their views were significantly diverse (std dev = 1.315). Further most of the respondents surveyed agreed that transition into the different project stages or phases was improved (mean=2.742) and their views were diverse(std=1.489). It was also revealed that 51.6% of the respondents believed that while scheduling of projects unforeseen physical and weather conditions were considered. It was generally concurred in respect of this proposition with significant variation in opinion (mean =2.887, std=1.450).

Finally, 52.4 % the respondents disagreed that reports and documentation were prepared within the time given. On average most of the respondents agreed with the opinion with (mean = 2.742) while at the same time, their views varied significantly (std dev = 1.489). The study agrees with Nguyen and Lan, (2014) that a project is considered successful if it is completed on time at cost. Time has always been at the center of evaluation of project success because it has a direct effect on cost and owner satisfaction. Time is an important parameter of measuring project success, an assessment of delays in project implementation indicates the performance of projects.

4.2.2 Descriptive Analysis for Project Costs

Table 3: Project Costs

	N	SA (%)	A (%)	U (%)	D (%)	SD (%)	Mean	Std. Dev.

Engineer, architect and project manager foresee possible future cost implication	97	23.7	30.9	6.2	19.6	19.6	3.196	1.491.
There are no cost overruns in the projects	97	18.6	19.6	14.4	24.7	22.7	2.946	1.467
Material prices are escalated.	97	21.6	33.0	3.1	21.6	20.6	3.134	1.480
Project cost is continuously monitored	97	27.8	30.9	9.3	13.4	18.6	3.361	1.406
Cash flow affects the evaluation and measurement of Project' cost performance	97	34.0	28.9	10.3	14.4	12.4	3.377	1.441
Cost issues must be discussed dispassionately	97	20.6	29.9	10.3	20.6	18.6	3.134	1.406
Construction companies use current quotation for labor, material and equipment cost to estimate the Project cost for the project	97	20.6	35.1	5.2	16.5	15.5	3.433	1.443

The study sought to establish the influence of project costs on project implementation. In regard as to whether engineer, architect and project manager foresee possible future cost implication of a project as shown in table 4.5. Most (54.6%) of the participants agreed with the proposition with a mean of 3.196 and standard deviation of 1.491.

Also, the study sought to establish whether there are no cost overruns in the projects. The findings revealed that 47.4% of the respondents were disagreed with the statement with a mean of 2.846 and standard deviation of 1.467. In addition, the study sought to find out whether the material prices are escalated. Majority (51.6%) of the participants were in agreement in their responses with a mean of 3.154 and standard deviation of 1.480.

Furthermore, the study sought to establish whether project cost is continuously monitored. The findings revealed of the respondents were in agreement with a mean of 3.361 and standard deviation of 1.406. In addition, the study sought to find out cash flow affects the evaluation and measurement of project' cost performance. Majority (62.9%) of the participants were in agreement in their responses with a mean of 3.134 and standard deviation of 1.441. The findings showed that majority of the respondents were in agreement that construction companies use current quotation for labor, material and equipment cost to estimate the Project cost for the project with a mean of 3.433 and standard deviation of 1.443. The study agrees with Yada and Radeta (2016) that the contractor should see into it that takes into consideration the cost of design change when planning for the project as failure to which cost of project may escalate. Fluctuations of material cost increase the cost of project. The contractor should predict the inflation and accounted for by the owners.

4.3 Correlation Analysis

4.3.1 Correlation Project cycle Time and Project Implementation

The researcher undertook correlation analysis to establish the nature and strength of the relationships between the independent and the dependent variables of the study.

Table 4: Project cycle Time and Project Implementation

		Time
Project Implementation	Pearson Correlation	.710**
	Sig. (2-tailed)	.000
	N	97

**. Correlation is significant at the 0.01 level (2-tailed).

The study conducted a correlation analysis between project cycle time and implementation of construction projects. From the results in Table 4.10, the study established that there exists a strong positive and significant relationship (r = .000, P=0.710) between project cycle time and implementation of construction projects. Therefore, the findings imply that project cycle time influences implementation of construction projects. This finding agrees with Nyangwara and Datche (2014) where time group factors were grouped second in importance by owner and consultants for successful project implementation

4.3.2 Correlation between Project Cost and Project Implementation

Table 5: Project Cost and Project Implementation

		Project cost
Project Implementation	Pearson Correlation	0.821*
	Sig. (2-tailed)	.000
	N	97

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

Further, the study conducted a correlation analysis between Project Cost and Project Implementation. The coefficient of Correlation (r=000 and P=0.821) illustrated in Table 4.11 shows that there is a strong positive and significant relationship between Project Cost and Project Implementation. The findings imply that costs affect project implementation. This study is in line with Munyoki (2016) that project cost influences completion of construction projects

V.CONCLUSION

From the summary of the findings it was evident that projects fail because they are not delivered on time and this as a performance metric has great influence on the implementation of construction project. It can also be concluded that the time taken from claim approval and payment approval from owner to company is average in most of the construction companies. It is clear that the schedule used are not detailed and easy to understand thereby making time planned for project not suitable for practical implementation of projects. Companies had enough time to implement variation orders. The transition into the different project stages or phases in most of the construction companies was improved and scheduling of projects for unforeseen physical and weather conditions were considered. Reports and documentation were not prepared within the time given.

VI.RECOMMEDATIONS

The study recommends that construction companies should do proper planning and scheduling. The schedules should be detailed and easy to understand. They should also ensure that time estimated for the project is not exceeded and they should make sure that their projects satisfy the owner needs.

Companies should ensure that they take all the necessary precautions so as to avoid construction cost overruns. This should be done by proper pre-construction estimates and careful project planning. Construction companies should be very keen in bidding for the project so that they quote the exact cost and not escalate material prices and conduct breakeven analysis from time to time.

The study recommends that construction companies should develop a risk management plan. A risk mitigation plan is designed to eliminate or minimize the impact of the risk events or occurrences that have a negative impact on the project. Project managers should also ensure that safety procedures are in place and are inspected frequently. This study can be replicated in other areas to eliminate region-specific biases in generalization. Also, the researcher recommends that a further study be carried on the influence of project controls on effective project implementation.

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