

INFLUENCE OF VARIATIONS IN SCOPE ON PERFORMANCE OF CAPITAL PROJECTS IN ENERGY-BASED STATE CORPORATIONS IN KENYA

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ABSTRACT

This study aims at establishing the influence of variations in scope on performance of capital projects in energy-based state corporations in Kenya. The research design used in this study was a descriptive survey. Managers and workers at Kenyan state businesses dealing with energy were the focus of this research. Where a sample size of 191 was selected at random from a pool of 368 using a proportional stratified sampling technique. The main data was gathered via the use of self-administered questionnaires. The data was also analyzed with the use of SPSS 21.0, the Statistical Package for the Social Sciences. Descriptive and inferential statistics were also used to examine the data. Quantitative variables were evaluated using descriptive statistics including frequency, percentage, mean score, and standard deviation. The relationship between the dependent and independent variables was assessed via the use of a multiple regression analysis. The data that was analyzed was given in tabular form. The research findings indicate a robust and statistically significant correlation between approval processes and performance of capital projects in energy-based state corporations in Kenya. This is evidenced by the beta coefficient value of 0.715 and have p-values less than 0.05. These results suggest that improvements in approval processes have a positive impact on the performance of capital projects in energy-based state corporations in Kenya. Based on the findings of this study, it is advisable for energy-based state corporations in Kenya to enhance the performance and completion rate of their capital projects. This can be achieved by allocating their financial, technical, and human resources towards improving efficiencies in the variations in scope.

Key words; **variations in scope, performance of capital projects and Energy-based state corporations.**

INTRODUCTION

Most African state enterprises adhere to a project life cycle procedure throughout the project's initiation, development, and completion phases. Specific tasks and activities, as well as the people who will be doing them and those who will be responsible for approving and evaluating them, are all mapped out in the life cycle process (Divr and Lechler, 2017). Capital projects are heavily influenced by the stages of project management, which include the following: project initiation and planning, project execution, monitoring, and project control. Time, money, scope, quality, hazards, and resources all play a role, and they are all competing restrictions. Resources in several East Africa's state corporations are being deployed to ensure development of new products, improvement of the process and designing of new services (PwC, 2017). Both the economic factors and poor scope management are the major factors that lead to the failure of capital projects especially in the developing countries (KIPPRA, 2018).

Due to the rapid changes in technology and environmental consciousness, the state corporations in Kenya had faced challenges because of elevated expectations to achieve their desired performance in capital projects (KNBS, 2018). Energy based state corporations have been one of the major contributors to the economy through provision of socio-economic infrastructure such as homes, hospitals and schools which have also increase job opportunities to the people of Kenya. However, numerous issues have been encountered in the latter stages of the lifespan of capital projects due to risks that were not well handled in the beginning. Change or lack of consideration of project success factors and the project environment are the primary obstacles to its completion (Muyia, 2018). Research of the elements that affect the success of capital projects in Kenya's energy-based state enterprises is warranted.

During the 1980s, influential organizations such as the World Bank and the International Monetary Fund (IMF) promoted privatization to liberalize economies and encourage private sector involvement. This approach aimed to shift the government's role to that of a facilitator, responsible for creating an enabling environment for the market to function efficiently. Consequently, these institutions emphasized reforms that supported the principles of a free market economy (Muyia, 2018). The implementation of Structural Adjustment Programmes (SAPs) emerged as a reaction to a fundamental change in the global politico-economic framework. The objective of these Structural Adjustment Programs (SAPs) was to restructure state-owned enterprises, with the goal of achieving financial independence and enhancing competitiveness by adopting a privatization approach. The approach in question was delineated in two key documents: the Policy Paper on Public Enterprise Reform and Privatization (1992) and the Policy Framework Paper (1993-96) (Gwaya, Munguti, & Wanyona, 2018).

The Kenyan Government has undertaken measures that requires investors support in terms of formulating and implementing strategies for developing capital projects in state corporations by

focusing on research, training, review, and industry support. However, the results have not been forthcoming as project managers and investors have neither the capacity nor the resources to undertake many of the project functions and responsibilities. According to a report published by PricewaterhouseCoopers (2017), the major causes of cost and time risks and overruns in projects undertaken by state corporations in Kenya during the implementation period are variations in scope, schedule, and budget.

Various researchers, including Muyia (2018) concede that state corporations projects have been difficult to achieve among practitioners and researchers, due to the complexity of factors. Empirical literature (Gwaya, Munguti and Wanyona, 2018; Kerzner, 2016 and Divr and Lechler, 2017) suggests that the financial challenges emerge as the top barrier to capital projects adopted by state corporations. Belassi and Tukel (2016) and Alexandrova (2015) looked at how infrastructural factors influenced state corporations' projects but majorly focused on western countries. This study therefore sought to cover the gap left by the scanty studies done to establish the approval processes and performance of capital projects in energy-based state corporations in Kenya.

Theoretical Framework

The theory for this research was offered by House and Baetz (1979). Leaders with a strategic mindset may continually invent new justifications for their company to remain. Strategic leaders, as described by Kirimi and Minja (2010), are responsible for shaping the development of strategic intent and strategic purpose, as well as influencing the formulation and execution of strategies that result in above-average strategic competitive returns. Several academics, including Bradley and Barrick (2008), have noted a growing interest in the field of strategic leadership. The extensive discussion of strategic leadership by Finkelstein, Hambrick, and Cannella (2009) piqued this audience's attention. The literature makes it clear that businesses have predetermined objectives. A leader's power lies in his or her capacity to persuade followers to make meaningful contributions to the organization's pursuit of defined goals and objectives.

Many strategic organizational leaders, according to Hitt, Haynes, and Serpa (2010), have been ineffective in the face of environmental volatility. It has been noticed that a lack of strategic leadership is the primary cause of an organization's failure. The failure of an organization's leadership to persuade its workers and, by extension, its customers, to buy into the company's vision is a common cause of failure, as noted by Kirimi and Minja (2010). Research shows that when businesses are led strategically, they have a clear purpose and set of goals. Give examples of how strategic leadership has enhanced the performance of organizations.

Kirimi and Minja (2010) agree with this view, noting the significance of strategic leadership to any given business. It is important to remember that strategic leadership is what helps a business succeed. In a similar vein, Serfontein (2010) suggested that a strategic leader's main objective is to learn as much as possible about the state of the company, its surroundings, and potential threats. Strategic leadership, according to Ahmed (2013), involves both management and leadership roles,

with the result that teams tackle strategic challenges as equal partners. Gill (2011) argues that to ensure their strategies are focused, relevant, and legitimate, strategic leaders must be capable of developing the organization's vision, purpose, strategies, and culture, as well as monitoring progress and changes in the environment. This theory is pertinent to the research at hand because it sheds light on the ways in which the performance of capital projects in Kenyan state enterprises focused on the energy sector is affected by the approval and procurement procedures involved.

Empirical Review

Before a contract is granted, the client agency will have authorized the scope of work to be performed under the contract. Principal Representatives are not tasked with coming up with ways to "improve" the final design that has already been authorized by the client (Fisher, Ury, & Patton, 2011). The tasks that must be completed to provide a result or product with the desired characteristics and capabilities are part of the project's scope. There are defining characteristics that set a capital project apart from regular operations. There is a short-term character to capital projects (Etgar, Gelbard, & Cohen, 2016). They are not routine business procedures and have set beginning and ending times. Since a sizeable portion of the capital project's time and resources are invested in keeping the project on schedule, this quality is crucial. Timelines are drawn out to demonstrate when activities need to begin and stop (Miller, 2013). The time required to complete a capital project might vary widely. The point of investing in something like a new factory is to create something that did not previously exist. In this regard, a capital project is exceptional. Unique denotes originality or the absence of any prior examples. Similar approaches have been used previously, but never quite how this one has (Leach, 2014).

Leach (2014) argues that operations, in contrast to capital projects, are never-ending and predictable. Continuous tasks have no set endpoint and entail repeating the same steps over and over again to get the same outcome. Operations exist to keep the business running, whereas capital projects exist to achieve their objectives and come to a successful close. In contrast to the one-off and transient nature of capital projects, operations are always occurring (Miller, 2013). The completion of a capital project occurs when all its objectives have been met. These objectives serve as the motivation for the capital project's planning and execution phases. Cancellation of a capital project is a common occurrence when it becomes clear that the project's aims and objectives cannot be realized, or when the product or service being developed by the project is no longer in demand (Sausser, Reilly, & Shenhar, 2016).

Capital projects sometimes have many restrictions that must be addressed by the capital project manager. In this role, it is crucial to strike a balance between these constraints, the interests of the stakeholders, and the aims of the capital project (Muller, 2017). For example, if the sponsor expresses a desire to incorporate additional features beyond the initial scope, it is highly probable that additional funding will be required to successfully complete the capital project. Conversely, if the budget is reduced, it will be necessary to compromise on the quality of the scope. Furthermore, if the necessary resources are not allocated for the tasks associated with the capital project, it will be necessary to extend the schedule due to the prolonged duration required for

resource completion of the work (Miller, 2013). In contrast, modifications to the execution of such job often adhere to a prescribed variation protocol outlined within the contractual provisions. The rationale behind establishing a variation procedure in advance for construction capital projects is rooted in the considerable scale and duration of these projects. By agreeing upon a predefined procedure for modifications, the administrative burden on the involved parties is reduced, as it eliminates the need to amend the contract each time there is a change in the scope of work (Fageha & Aibinu, 2016). As long as the modification is executed in accordance with the appropriate process, there is no need to modify the substantive provisions of the contract. Consequently, it is unnecessary to establish the provision of consideration for the change to be deemed valid (Highsmith, 2009).

Changes to the project's scope might eventually affect its quality. A project's success or failure might hinge on the slightest of details. However, overall project scope must be managed. Maintaining order does not entail stifling experimentation. On the other hand, if adjustments are necessary to meet criteria that are more current than the initial standards, then such adjustments must be made (Nguyen, 2010). The cost, timeline, hazards, and quality of a project may all be drastically affected by a change in scope, making its control and management essential to its success. According to Nguyen (as cited in Sauser, Reilly, & Shenhar, 2016), regulating project scope entails figuring out what triggers' changes in the project's scope, what causes such changes, and what risks are involved.

Scope changes should be clearly specified and managed when they are required to satisfy stakeholder expectations. According to Knapp (2011), one of the most prevalent causes of project failure is a failure to properly define and manage the scope of the project. Petersen (2017) explains that if stakeholders' expectations are not effectively managed, the project's scope may expand unnecessarily, leading to discontent among its intended beneficiaries. The term "scope creep" refers to when a project's parameters expand or contract beyond the original design. However, if left uncontrolled, scope creep may swiftly drain a project's resources (time, money, and people) and push back the completion date. Keeping the project's scope concealed is crucial to its success. Changes in scope may influence the project's timeline, budget, and even quality. Beneficiaries, the project sponsor, or any other interested parties might request alterations to the project's scope. Changes to the planned activities for a project may be requested via a scope change request (Peltier, 2016). The project plan should include a procedure for handling requests to alter the project's scope. This method would provide the mechanism and authority for approving such modifications beyond those that may be agreed by the project team (Camilleri, 2016). Throughout the project's lifespan, identifying, conveying, and reconciling new requests is essential for effective scope management. Changes to the project's scope usually result in more work, more money, more people, more time, and more risk. Several little adjustments to the project's scope may have just as much of an effect as one major one (Sauser, Reilly, & Shenhar, 2016).

RESEARCH METHODOLOGY

The purpose of this study was accomplished using a descriptive survey research methodology.

Project managers and staff members employed by Kenyan state businesses with an energy-based business made up the target group for this research. A sample size of 191 was ascertained from the total number of 378 respondents with a level of 95% certainty and a 0.05 blunder. The stratified proportionate arbitrary inspecting method was used in choosing of the study's respondents. The main data was gathered using well-structured questionnaires. The respondents were given the surveys to complete themselves using a drop-and-pick method. Since the questionnaire will ask the questions in a consistent manner, the replies should be compatible. The core data was collected using a series of structured questions that were included in a letter sent out by both UoN and NACOSTI. A pilot study was undertaken to make sure that the instrument items in the data collecting instrument, the questionnaire, are precise and clear. This pilot study evaluated the instrument's precision and clarity as well as the length of time needed to administer it. The reliability and validity tests were then carried out on the randomly chosen respondents who had participated in the pilot research but were left out of the main study sample. For each of the four distinct goals, we employed the universally valid Likert scale questions to collect our data. Expert input was sought throughout its development to assure the study's content validity. To guarantee that the items in each research variable are adequate and reflective of the study's aims and goals, the instruments were developed and operationalized in accordance with those variables. Additionally, supervisory and practical expertise was consulted to confirm the content authenticity.

Each research variable's items were established and operationalized in line with the study's objectives and goals to ensure accuracy and reliability. The material was verified via the use of both theoretical and practical knowledge from supervisors and experts.

For this study, it is adequate if the produced composite unshakable quality co-effective (Cronbach alpha) is 0.7 or above for each of the constructs (Cronbach, 1951). Cronbach's alpha was used to determine the reliability coefficient of the study's survey using the following formula:

$$9\alpha = \frac{k}{k-1} \times \left[1 - \frac{\sum (S^2)}{\sum S^2_{sum}} \right]$$

9Where: 9

9 α = Cronbach's 9 alpha 9

9k = Number 9 of 9 responses 9

9 $\sum (S^2)$ = Variance 9 of 9 individual 9 items 9 summed 9 up 9

9 $\sum S^2_{sum}$ = Variance 9 of 9 summed 9 up 9 scores 9

The alpha level was determined using a one-way analysis of variance. The research revealed an alpha coefficient of 0.876 between the 10 items. Their dependability levels were over the required 0.7, therefore it was trustworthy. The results are detailed below: In this study, ethical issues were highly considered and maintained where the privacy, confidentiality, data protection, voluntary participation, and informed consent by participants in data collection was upheld. Initially, a thorough verification process was conducted to ensure the accuracy of the information collected from the respondents. The whole of the surveys that were returned were thoroughly examined, classified, and tallied to guarantee precision. The survey included a combination of open-ended and closed-ended inquiries.

Results

The fourth objective was to assess the influence of variations in scope on performance of capital projects in energy-based state corporations in Kenya. Aspects of cost, time, quality of work done, management of the project and budgeting process will be assessed. According to Table 1 below, an average score of 4.00 shows that the aspects of variations in scope influenced performance of capital projects in state corporations in Kenya in that.

Table 1 Variations in scope

	Mean	Std. Deviation
Cost	4.12	1.234
Time	4.08	.764
Quality of work done	4.01	.827
Management of the project	3.88	1.101
Budgeting process	3.93	.567
Total	20.02	4.493
Average	4.00	0.898

Cost (mean=4.12), time (mean=4.08), quality of work done (mean=4.01), budgeting process (mean=3.93), and management of the project (mean=3.88) influenced performance of capital projects in state corporations in Kenya to a great extent. From the findings, variations in cost of the project should be investigated before engaging in the other aspects. This is evidenced in the current projects like SGR as compared to Thika Superhighway which was done years ago which raises issues of cost and the budgeting process.

A multiple regression analysis was performed to analyse the influence of approval processes, procurement processes, project standards and variations in scope on performance of capital projects in energy-based state corporations in Kenya. The results were as summarized below.

Table 2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.825 ^a	.681	.672	.6484

Predictors: (Constant), approval processes, procurement processes, project standards and variations in scope

The model summary includes the coefficient of determination, denoted as R square, which provides insight into the extent to which changes in the independent variables account for the variation seen in the dependent variable. The R-squared value, as indicated in Table 4.11, was 0.681, indicating that 68.1% of the variation in the dependent variable (performance of capital projects) can be attributed to variations in the four independent variables (variations in scope). Therefore, it can be concluded that a sizeable portion, namely 31.9%, of the variability seen in the performance of capital projects within energy-based state companies in Kenya cannot be accounted for by the parameters included in the model or examined in the present research.

Table 3 ANOVA (Analysis of Variance)

Model	Sum of Squares	df	Mean Square	F	Sig.
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	Regression	123.973	1	30.99325	72.12	.0000 ^a
1	Residual	58.018	138	0.42976		
	Total	181.991	139			

a. Predictors: (Constant) variations in scope

b. Dependent Variable: Performance of capital projects

The Analysis of Variance (ANOVA) procedure involves doing computations to assess the degrees of variability present within a regression model, so establishing a foundation for conducting tests to determine the significance of the model. The "F" column presents a statistical measure used to assess the hypothesis that all β values are not equal to zero, as opposed to the null hypothesis that β is equal to zero (Weisberg, 2005). Based on the results shown in Table 3, the obtained significance value was 0.0000, indicating statistical significance at a level lower than the predetermined significance threshold of 0.05. This statement suggests that the regression model used in the study demonstrated statistical significance in predicting the impact of approval procedures, procurement processes, project standards, and changes in scope on the performance of capital projects within energy-based state businesses in Kenya. Moreover, the critical value of F at a significance level of 5% was determined to be 72.12. The F computed value of 72.12 exceeded the F critical threshold of 2.44, providing further evidence that the overall model was deemed to be suitable.

Table 4 Regression coefficients results

	Unstandardized Coefficients		Standardize d Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.608	0.982		4.692	0.000
Variations in scope [X ₄]	0.715	0.160	0.694	4.469	0.000

Based on the regression results shown in Table 4.13 above, the regression model became.

$$Y = 4.608 + 0.715 X_4 + \varepsilon$$

From the regression equation above, taking all the predictor variables (variations in scope) constant at zero, performance of capital projects in energy-based state corporations in Kenya would be 4.608. Table 4.4 also shows that there is a positive and statistically significant relationship between variations in scope and performance of capital projects in energy-based state corporations in Kenya, with each unit increase in variations in scope was associated with a 0.715 increase in performance of capital projects, both of which were statistically significant. The p-value for each predictor variable was less than 0.05. This indicated that improvements in variations in scope significantly predicted performance of capital projects in energy-based state corporations in Kenya.

Conclusion and Recommendation

The research also found that capital project outcomes in Kenyan state-owned enterprises were

significantly affected by scope differences. Therefore, it is crucial to carefully manage variations to lessen the possibility of going over budget and finishing the tasks late. The capital project schedule and budget can only be met if no changes are made to the contract throughout its performance. Before a contract is granted, the client agency will have authorized the scope of work to be performed under the contract. It is important to remember that the principal's representative has no authority to "improve" the final design that has been authorized.

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