

# **INFLUENCE OF APPLICATION OF PROJECT STANDARDS ON PERFORMANCE OF CAPITAL PROJECTS IN ENERGY-BASED STATE CORPORATIONS IN KENYA**

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**International Academic Journal of Information Sciences and Project Management (IAJISPM) | ISSN 2519-7711**

**Received:** 15<sup>th</sup> November 2023

**Published:** 24<sup>th</sup> November 2023

Full Length Research

**Available Online at:** [https://iajournals.org/articles/iajispm\\_v3\\_i7\\_223\\_233.pdf](https://iajournals.org/articles/iajispm_v3_i7_223_233.pdf)

**Citation:** Njoka, B. K., Gikonyo, N. (2023). Influence of application of project standards on performance of capital projects in energy-based state corporations in Kenya. *International Academic Journal of Information Sciences and Project Management*, 3(7), 223-233.

## **ABSTRACT**

This study aims at establishing the influence of application of project standards 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 application of project standards and performance of capital projects in energy-based state corporations in Kenya. This is evidenced by the beta coefficient value of 0.747 and have p-values less than 0.05. These results suggest that improvements in application of project standards 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 application of project standards.

**Key words:** Application of Project Standards, Performance of Capital Projects And Energy-Based State Corporations.

## **INTRODUCTION**

Across the world, developing nations rely heavily on capital projects to boost their economies (UNDP, 2016). Capital projects are classified into several classifications that are markedly different: They are: housing, non-residential buildings, highways, and industries. Capital projects undertaken by state corporations include constructing new projects, renovating them, and demolishing of buildings. Construction of roads, highways, streets, bridges, tunnels, and overpasses are all examples of public works projects (UN-Habitat, 2017). Time, budget, a defined scope, and requisite quality specifications that have been assigned for the project are the factors that measure its success and performance. For the capital projects to be successful they are backed up by effective project management skills. The business goals and project outcomes are linked through strategic competency which results to project management. Management of projects by the government involves ensuring that project goes in line with the budgeted resources time, cost, scope, quality, and reliable performance (ISO, 2016).

Management of capital projects has a critical impact in ensuring that the project stakeholders, that is, the client, contractor or developer, the consultants and the service providers meet their contractual obligations; minimizing the negative implications that may arise due to cost overruns, time delays, sub-standard quality, dissatisfied client and changes in scope of works (Sausser, Reilly and Shenhar, 2016). The capital projects are governed by various output aspects and the effectiveness is ensured by several stakeholders. The factors that may influence performance of capital projects include approval processes, procurement processes, quality specification standards, variations in the project scope, Worker protection laws, business coalitions, and state economic strategies. Donor organizations, user groups, design consultants, contractors, suppliers, and government agencies are just some of the many parties involved in this initiative (Kerzner, 2016).

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).

Kenya's capital projects industry has grown rapidly in recent years, particularly in the fields of transportation and energy infrastructure and residential construction. The government's Vision 2030 and the more recent 'Big Four Agenda' have fuelled this development. A successful project is one that is completed on schedule, within budget, and to the required quality standards. Risks in project funding, cost overruns, delays in project completion, project faults, and accountability of procurement plague Kenya's capital projects from the planning to the execution phases. The failures are due to ineffective management of the project success factors that include the approval processes, procurement processes, application of project standards and variations in scope.

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 seeks to cover the gap left by the scanty studies done to establish the project contractual processes and performance of capital projects in energy-based state corporations in Kenya.

## **Theoretical Framework**

Fredrick (2005) put out a change theory. As a method for bringing about social change, it offers a flexible and creative alternative to traditional methods to planning and rationality. A theory of change details the factors and actions that will bring about a desired future state. It also specifies the approaches used to achieve the desired outcomes. Investors utilize assumptions (often backed up by research) to describe the change process, which is explained by a theory of change (Rogers, 2008). A group of people working on a project have a set of assumptions and broad expectations about how they think reality will unfold soon. Drawing upon a comprehensive examination of the present circumstances, a reflective evaluation of one's aptitude for facilitating processes, and a meticulous and explicit examination of the literature,

this study explores the assumptions surrounding community engagement in monitoring and evaluation. Additionally, it investigates a method that enables individuals and groups to monitor their own thought processes (Rogers, 2008) conscientiously and critically.

The theory of change elucidates the potential mechanisms via which changes may transpire. Its purpose is not to forecast change, but rather to comprehend the processes by which change may be facilitated by community engagement in monitoring and assessment, as well as how it can be impacted by intervention tactics. The study determined that the theory of change is the most suitable approach to adopt in addressing social and community-based issues such as school feeding programs. This approach involves a deliberate and visualized exercise that allows investors to direct their efforts towards specific future outcomes that are both desirable and feasible. The theory of change provides a foundational knowledge of how the implementation of project standards and changes in scope impact the performance of capital projects.

### **Empirical Review**

The standards and procedures give project-specific instructions on the processes, naming conventions, supporting tools, equipment, standards, and metrics to be implemented by the capital project team to accomplish quality targets at each step of the capital project (Peltier, 2016). Guidelines for managing time and money spent on a project, including how to organize tasks, keep track of finances, and assess progress. Data management guidelines, including those for the capital project archive, document naming, document numbering, and document formatting. Guidelines for managing configurations, including best practices for inventorying, monitoring, and reporting on configuration elements. Quality management protocols, including but not limited to walk-throughs, reviews, audits and inspections, storage, packing, shipping, and root-cause analysis (Lee & Chakala, 2019).

Configuration management is crucial for capital projects to maintain quality and efficiently handle all the paperwork that is generated during the project (Petersen, 2017). Controls in configuration management track all documents and make sure only approved versions are used while out-of-date ones are put away safely. The endorsement of authorized specifications has significant importance in ensuring the effectiveness of capital projects and configuration management. Investors should be aware of and obedient to this signing requirement. This helps keep the project's scope in check and makes it easier to handle adjustments (Miller, 2013).

The document naming convention should include a system for tracking and managing different versions of the same file (Kerzner, 2018). By adhering to version control procedures, everyone involved in a project will always be aware of the most up-to-date document and the document that should be considered the canonical version. This enables for a comparison of the initial agreed-upon criteria with the current situation, which is crucial in change management and helps to avoid scope creep. Every required capital project document should follow a uniform naming convention throughout its life cycle, including the capital project ID, In the context of document management, it is common practice to assign a standard document name, version, or, in the case of weekly documents for capital project monitoring, the date and sequential

number of documents. The purpose of this practice is to guarantee that every document has a unique identification and can be monitored within a regulated setting (Sausser, Reilly, & Shenhar, 2016).

The projects' standards and processes are derived on the following fundamental principles: In order to facilitate effective collaboration among a considerable number of individuals involved in project operations, it is necessary to establish predetermined standards and processes. The team will actively engage in the development or adoption of standards to ensure their ownership. Subsequently, the team will self-regulate their adherence to these standards as they strive to achieve high quality outcomes. Diligent efforts will be undertaken to ensure the clarity and effectiveness of the standards and procedures, while avoiding the imposition of unnecessary standards or excessively intricate procedures, once the standards have been legally established, they will be recorded, readily available, and simple to comprehend. There will also be room for the standard to change if someone produces an improvement, but older content will not be rewritten only to stay up with the times (Leach, 2014). For instance, they may require that all projects be reviewed and authorized in accordance with predetermined minimum sustainability criteria, or they may attempt to negotiate for more stringent sustainability goals. It is worth noting that the need of making initiatives sustainable is often overlooked (Verzuh, 2015).

The establishment of project management standards is crucial for ensuring effective project planning. These standards should include a defined project management methodology, offering comprehensive advice and step-by-step instructions for building the standards themselves. Additionally, they should aim to expedite project reporting processes and provide the required documentation during the whole duration of the project (Verzuh, 2015). Standards for project planning should be able to both describe broad categories of project work and cater to the unique needs of each project. All team members should be able to recognize project goals and understand how their work contributes to achieving them, hence specificity is essential in the project standards (Taugwalder, 2017). Timely and effective project completion is predicated on having well-defined goals. As far as feasible, all relevant stakeholders should be consulted while developing the project's standards and needs (Schwalbe, 2015).

The standards for planning a project must account for the strengths and weaknesses of the entire project management system, define the project's objectives, arrange the relevant data so that they can be quickly identified, and include a strategy for bridging a system network to effectively monitor and control the project. It has been shown that more detailed criteria for planning a project increase efficiency by helping all team members better comprehend the project's goals (Camilleri, 2016).

Quality assurance is an integral aspect of project planning best practices, and quality assurance processes should include measures to guarantee buy-in from the whole team. Quality assurance professionals should have the support of audit and compliance authorities to ensure that all internal and external project requirements are met. The extent to which a given project may be

scaled is not constant. It is obvious that quality control measures should be commensurate with the scope, nature, and level of danger posed by the project (Leach, 2014).

## **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:

$$A = \frac{k}{k-1} \times [1 - \frac{\sum (S^2)}{\sum S^2 \text{sum}}]$$

Where:

$\alpha$  = Cronbach's alpha

k = Number of responses

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

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

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.

**Results**

The third goal was to determine how the use of project standards affects the success of major construction projects for Kenya's energy ministry and other government agencies. This study evaluates how site litigation, approval process, controlling policies and building standards influence performance of the project. The research found that the project standards feature significantly impacted the performance of capital projects in Kenyan state enterprises, with an average score of 3.82.

*Table 1: Project Standards*

	<b>Mean</b>	<b>Std. Deviation</b>
Site litigation	3.83	.973
Approval process	3.90	1.245
Controlling policies	3.72	.315
Building standards	3.85	.659
<b>Total</b>	<b>15.3</b>	<b>3.192</b>
<b>Average</b>	<b>3.82</b>	<b>0.798</b>

Approval process (mean=3.90), building standards (mean=3.85), site litigation (mean=3.83) and controlling policies (mean=3.72) influenced performance of capital projects in state corporations in Kenya to a great extent. The findings show that these four aspects of projects stand are very vital. The first aspect which should be investigated is the approval process and the building standards therein.

A multiple regression analysis was performed to analyse the influence of project standards 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 <sup>a</sup>	.681	.672	.6484

Predictors: (Constant), project standards

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 4.2, 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 independent variable (project standards).

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.
1	Regression	123.973	1	30.99325	72.12	.0000 <sup>a</sup>
	Residual	58.018	138	0.42976		
	Total	181.991	139			

a. Predictors: (Constant), project standards

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  $\beta$  values are not equal to zero, as opposed to the null hypothesis that  $\beta$  is equal to zero. 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 project standards on 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 2.44. 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
Project standards [X <sub>3</sub> ]	0.747	0.151	0.732	4.947	0.000

Based on the regression results shown in Table 4.4 above, the regression model became.

$$Y = 4.608 + 0.747 X_3 + \epsilon$$

From the regression equation above, taking all the predictor variables (project standards) 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 project standards and performance of capital projects in energy-based state corporations in

Kenya, with each unit increase in project standards resulting in a 0.681 increase in performance of capital projects; the p-value for the predictor variable was less than 0.05. This indicated that improvements in project standards, significantly predicted performance of capital projects in energy-based state corporations in Kenya.

## **Conclusion and Recommendation**

Capital projects in Kenyan state-owned companies benefited from strict adherence to project standards. Guidelines for managing time and money spent on a project, including how to organize tasks, keep track of finances, and assess progress. Data management guidelines, including those for the capital project archive, document naming, document numbering, and document formatting. Guidelines for managing configurations, including best practices for inventorying, monitoring, and reporting on configuration elements. Quality management protocols, including but not limited to inspections, walkthroughs, reviews, archiving, packing, shipping, and root-cause-analysis techniques.

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.

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