

Influence of Management of Project Constraints on Completion of Building Construction Projects in Nakuru County, Kenya

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Abstract: Construction companies are often faced with various constraints like funding, technology, materials and more as they plan, organize, schedule and execute various projects. Most constraints of any kind tend to hinder project progress. Many projects in both public and private stall at different stages before completion, this has been attributed to project constraints. Thus, the study sought to establish the influence of management of project constraints on completion of building construction projects in Nakuru County, Kenya. The study specifically sought to determine the influence of management of scope and resource on completion of building construction projects in Nakuru County. The study used a descriptive survey research design. The target population was registered building constructions in Nakuru. The researcher used one respondent in each of the company therefore the total target population was 546 respondents. The study used Nassiuma's formulae to get a sample of 85 building construction companies. Questionnaires were used to collect the primary data desirable for the study. The validity of this study was enhanced in search of views of experts in the field of study. while reliability in this study was enhanced by pre-testing the questionnaires with a selected sample which was not included in the main study. The data that was gathered in this study was quantitative in nature and analyzed by utilization of Statistical Package for Social Sciences (SPSS). Descriptive and inferential statistics were employed in the study. The findings indicated there was a positive and statistically significant correlation between management of scope and completion of building construction projects in Nakuru county. ($r=0.443$; $p=.013$), the study also showed that there was a positive and statistically significant correlation between management of resource constraint and completion of building construction projects in Nakuru County. ($r=0.441$; $p=.016$). The study recommends that project managers should effectively manage scope, resource and time constraints. The study suggests that similar studies should be conducted among other types of projects in other counties using other factors other than the ones studied

Keywords: *Project Constraints, Resource Constraint, Scope Constraint*

I. Introduction

Project Management can be defined as the act of applying knowledge, skills, tools, organizing and managing resources in a disciplined way so that a project at hand would be completed within the defined scope, quality, time and cost constraints, (Kimiti,2018). A project is generally considered successful if it comes in on-schedule, comes in on-budget, and achieves entirely all the goals originally set for it and is accepted and used by the clients for whom it is intended according to (Kibaara, 2016).

Rugenyi, (2016) asserts that the successful accomplishment of the project objective could be constrained by many factors, including scope, quality, schedule, budget, resources, risks, customer satisfaction, and stakeholder support. Mahamid, (2015) while investigating the time delay in road construction projects in the West Bank in Palestine, found that all projects suffer from time overrun and that 70% of the projects experienced delays between 10% and 30% of the contracted duration, further they observed that poor communication between construction parties, poor resource

management, delays in commencement, insufficient inspectors, and rework. In a study investigating the significant factors causing time overrun in construction projects of Peninsular Malaysia, Memon, (2014), found that the significant factors contributing to construction time overrun are cash flow and financial difficulties faced by contractor, poor site management and supervision, incompetent subcontractor, few workers and financial capabilities of the owner.

Delays in construction projects delivery is common in most of the African countries for instance as cited by Hussin and Omran (2017), he stated that in Nigeria, seven out of ten projects surveyed suffered delays in their execution. Further, Akinsola, (2016) observed that in Nigeria 5-10% of construction pre-contract cost is based on contingency. In South Africa, Olatunji, (2010) observed that this is a phenomenon that can be attributed to the inability of the client and the project team to have a comprehensive view of the construction project from initiation all through to completion. As studied by Aiyetan, (2014) causes of client dissatisfaction in the South African building industry included conflict, poor quality and incompetence of contractors which adversely impacted on project performance. Further, they observed that quality and attitude to service is one of the key factors constraining successful project delivery in South Africa.

The construction industry in Kenya mostly maintains an upward trend in growth. In 2013 and 2014, an economic survey report released by Kenya National Bureau of Statistics (KNBS) showed Kenya's building and construction as having contributed 4.8% to the Gross Domestic Product (GDP). In the year 2015, the Kenyan construction industry contributed 7 percent of the Gross Domestic Product (GDP), making it clear that Kenya has a well-developed construction industry. However, construction projects in Kenya face a myriad of constraints that if not properly managed can lead to unsuccessful completion of projects. According to Nahinja, (2014), construction regulation authorities eliminate corruption cases in the construction and building industry, emphasize on both material quality and contractor performance, and revise the Building Codes to ensure relevance. However, according to Transparency International (2014), contractors and owners of the buildings bribe the inspection unit to bypass the inspection process thus delivering substandard projects that don't meet specified quality. In Kenya, Kariungi (2014) concluded that procurement delays, timely availability of funds and climatic factors are the main factors that influence the timely implementation of construction projects. Regardless of the key role the industry plays in Kenya, it continues to face a number of challenges ranging from low completion rates, lengthy procurement procedures lack of affordable project financing, stringent policies, laws and regulations, low technological uptake and exposure levels of stakeholders to international best practices, low quality construction material, poor quality of works as a result of poor workmanship and use of substandard material

Statement of the Problem

Construction projects are time bound endeavors meant to be realized within a stipulated time covering predetermined scope and within budget. Many projects both public and private stall at different stages before completion, according to reviewed literature, this has been attributed to lack of proper management of project constraints, most constraints of any kind tend to hinder project progress. Constraints in construction projects limit their achievement of high performance. Identifying the constraints provides the practical steps for making organizational decisions in which constraints exist. If constraints are better understood at the outset, it is believed that better performance can be assumed (Mishra,2019). Poor management of project constraints is one of the major challenges facing construction projects (Rugenyi, 2016). Project constraints need to be taken into account to determine whether complete project success is achieved. Construction Projects are often faced with various constraints like time, scope, legal, funding, technology, resources and more as they plan, organize, schedule and execute various projects, however, if they are unable to manage these constraints effectively it results to increased number of stalled projects within the construction industry. Despite the many constraints that are part of the construction projects, ranging from: time, scope, resource, quality, finances, legal, few studies have been done to establish how these constraints can be managed effectively to ensure that the projects meet their expected goals. It is for this reason that the researcher sought to carry out a study on the influence of management of project constraints on completion of construction projects in Nakuru County Kenya.

Objectives of the Study

General Objective

The general objective of the study was to assess the influence of management of project constraints on completion of building construction projects in Nakuru County, Kenya.

Specific Objectives

- i. To examine the extent to which management of scope constraint influences completion of building construction projects in Nakuru County, Kenya.
- ii. To determine the extent to which management of resource constraint influences completion of building construction projects in Nakuru County, Kenya.

Research Hypotheses

H₀₁: Management of scope constraint has no statistically significant influence on completion of building construction projects in Nakuru county, Kenya.

H₀₂: Management of resource constraints has no statistically significant influence on completion of building construction projects in Nakuru county, Kenya.

II. Theoretical Framework

The study was anchored on the concept of theory of constraints and project competency theory

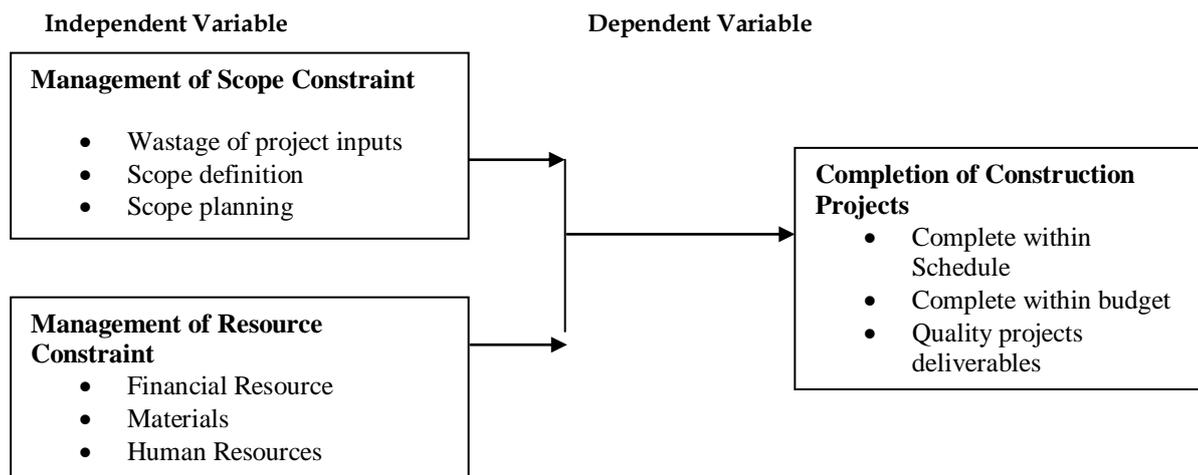
Theory of Constraints

Theory of Constraints (TOC) is a management philosophy which is focused on the weakest ring(s) in the chain to improve the performance of systems and was first put forth by Goldratt (1984) in his novel *The Goal*. The theory can be used to demonstrate how managers can effectively manage organizations based on the assumption of system thinking and constraint management (Rahman, 2011). The theory emphasizes on three things, finding 'what to change', deciding 'what to change to', and finally 'how to cause the change'. This theory has found application in two areas within project management; scheduling of a single project to reduce project duration and simplify control, and allocating resources that are shared by concurrent projects. This is because; increased cash flow can be obtained faster as a result of extending duration, setting aside contingency cost of delays which could be very high, and extending project duration. According to Rahman, (2011), Theory of Constraints focuses on improving the system which is seen as a series of independent processes. Application of the principles of TOC in practice requires a comprehensive approach of the entire production system. One of the three principles of TOC is concentration, i.e. focus on the most important issues. It means that all important processes and positions should be supervised. The constraint theory is relevant to the current study in the manner that project management highlights the interdependence of the three indispensable goals of project management which includes the project scope, time and cost management. A project has a distinct scope, schedule, and budget, project management portrays the marvel that, an adjustment in one of the three, will influence the other two components.

Project Management Competency Theory

The work of McClelland & McBer in the 1980s came up with the competence theory. The authors defined competency as the fundamental attributes of an individual that is causally related to superior performance in a job or situation. Crawford (2007), developed a model of competence that integrates knowledge, skills, demonstrable performance, and core personality characteristics, noting the last, personality traits, as challenging to develop and assess through training. She concurs that one of the most influential project management standards, the PMBOK, only highlights the knowledge perspective of competence while a second, Australia's National Competency Standards, draws from knowledge but focuses only on provable performance. A competence articulates the expected outcome or performance standard that is achieved as a result of applying a combination of knowledge, personal attitude, and skills and experience in a certain function (APM, 2018). A competent project manager implements proper project management techniques, avoids misuse of management techniques, ensures commitment to the project, spends time to define the project, correctly plans activities in the project, ensures correct and adequate information flows, changes activities to accommodate frequent changes, accommodates employees' personal goals with performance and rewards and makes a fresh start when mistakes in implementation are identified (Natchayangkun, 2014). The theory is relevant to the current study in the manner that the resource constraints is basically rooted in the competence of the workers including the skills, knowledge, labor and other attributes. This is due to the basis that project management competence emanates from the very rationale and widely held assumption that if people who manage and work on projects are competent, they will perform effectively and that this will result to successful projects and successful organizations.

III. Conceptual Framework



IV. Review of Literature on Variables

Management of scope constraint on Project Completion

Project scope is the inclusive definition of the boundaries of a project. It highlights what the project endeavors to accomplish, and a precise description of what the end result should look like. Quality of the final product is the major component of project scope. The amount of time allocated to individual tasks determines the overall quality of the project. There are tasks that may require a given amount of time to complete fully, but given extra more time could be completed exceptionally. Over the course of a large project, quality can have a significant impact on time and cost (vice versa), (Njau&Ogolla, 2017). Project scope management includes all the processes of defining what work is required and then making sure that all of that work and only that work is done. Project scope management involves planning, creation of work breakdown structure and verification and control of project scope (PMBOK, 2016).

Project scope management includes all the process that define what work is required and then ensuring that all of that work and only that work is performed. Project scope management involves planning, creation of work breakdown structure and verification and control of project scope (PMBOK, 2016). Ogunberu, Olaposi and Akintelu (2016) substantiates that the major project scope management practices employed by telecommunication firms were define project scope, create work breakdown structure, verify scope, and control scope. A project scope statement is critical for obtaining support because it gives sponsors confidence that the project objective is understood and will achieve its set goals and objectives. Project scope definition and management involves understanding, documenting and implementing requirements that are needed to fulfill project goals and objectives.

Adedayo (2018) examined the application of project scope constraints management practices on project success employed by telecommunication organization in the implementation of Information and Communication Technology (ICT) projects. The study adopted primary data source obtained with the use of questionnaire on a total of three hundred and seventy-five (375) respondents which include one hundred and twenty-five (125) project sponsors, one hundred and twenty-five (125) project managers/coordinators and one hundred and twenty-five project team members on ICT projects. Data collected were analyzed using both descriptive and inferential statistics. The result revealed that the major project scope management success criteria were customer satisfaction and customer and customer expectation. It was concluded that the project success criteria of the firms were generally satisfactory and very satisfactory with the implementation of project scope management practices.

Nibyiza (2015) sought to investigate the analysis of project scope change management as a tool for project success case study of AkaziKanoze projects. The specific objectives of this study were to determine the causes for scope change; to analyze the effect of adjusting project activities on project success; to analyze the influence of time on product/ service quality derived, changing project cost, and to identify challenges related to changing the project scope in AkaziKanoze projects. The population of the study was 30 employees working in the area of projects operations and management. The study employed a census sampling technique. Primary data was collected using interview and questionnaire and secondary data collected by review published materials. The findings of the study revealed that changes in project

activities provoke the changes in project cost, time and quality of the product/service of the project. This leads to beneficiaries' satisfaction because of receiving product/service of the good quality.

Management of resource constraint and Project Completion

Resources are the people, materials and equipment that the project require to be completed. The crucial factor in successful implementation of a construction project not only depends on the quality & quantity of work, but also largely depends on availability of resources, Shalk (2016). All activities involved in the project require certain amount of resources. Each activity is allocated with a specific resource and must be completed within the time limit, otherwise it may adversely affect the overall duration of the project. A key to managing resources is effective communication. Suppliers, contractors, laborers, and managers every person who plays a role in your project should be completely aware of their respective roles: the what, where, when and how of their tasks, (Mwenda, 2018). The more you keep your project's players in the loop, the more likely they can bring the project to a successful conclusion.

Resource management is a facet of project management that deals with the human, financial, distribution and demands of project resources (Bowen, 2015). It is the process of identifying initiatives for resources based on priority, planning resource allocation, tracking resource usage and productivity, improving allocation and measuring effectiveness of resources. Resource management includes planning, allocating and scheduling of resources to tasks, which typically include manpower, machines, money and materials (Haugan, 2014). Resource management has an impact on time schedules and budgets. Resource allocation involves the planning of all the resources required for the project (Schwindt, 2015). With a lot of things to take care of in project management, resource management remains a major building block without which it is simply impossible to complete the project successfully. Resource management is a key element to activity resource estimating and project human resource management. Both are essential components of a comprehensive project management plan to execute and monitor a project successfully (Anderson& Jessen, 2016).

Kumar and Nair (2014) conducted a study on the impact analysis of allocation of resources by project manager on success of software projects. The research comprised of an empirical study of several projects developed in a product and service based CMMI Level 5 Software Company. The analysis indicated the vital role of project managers in optimizing the resource allocation towards development of software. An awareness of efficiency level of project manager in optimal allocation of resources enables one to realize the desired level of quality.

Ramage (2014) reviewed the resource management strategies for engineering leaders to improve project success rates. The purpose of this single case study was to explore resource management strategies used by some project leaders in the engineering field to improve project success rates. Data was collected using semi structured interviews with 3 purposefully selected project leaders in Georgia, and a review of project completion reports, budget reports, government projects, and scope management documents. Data analysis occurred using Yin's 5-step process of compiling, disassembling, reassembling, interpreting, and concluding the data. The findings indicated that implementing the time management strategies of client management, schedule adherence, and communication with all stakeholders are essential for improving engineering project success rates.

Gachuga, Kule and Ndabaga (2016) conducted a study on the effect of funds management on project performance in Rwanda. Specific objectives were to analyze relationship between budgeting and project performance in Rwanda; to determine the influence of fundraising on project performance in Rwanda; to determine the effect of funds allocation on project performance in Rwanda; and to analyze the effect of funds control on project Performance in Rwanda. The study adopted a descriptive-correlation design and used both qualitative and quantitative research approaches. The study population was 91 employees. Questionnaires were used in this study as data collection instruments. Descriptive statistics were used to determine frequencies and percentages of respondents, while regression analysis and Pearson correlation coefficient were used to establish relationship between variables under study. The researcher found that there is a positive relationship between funds allocation and project performance in Rwanda. The findings further revealed that there is a positive relationship between funds control and project performance in Rwanda.

Research Gaps

Rugenyi (2016) while conducting a study on the effects of triple constraints on the management of projects in Nairobi: the project managers' perspective. The study was conducted on the overall project management while the current study was conducted on the construction projects. The study was conducted in Nairobi while the current study was conducted in Nakuru. Langat (2015) factors influencing completion of building construction projects in public secondary schools in

Bomet east sub-county, Bomet County, Kenya. The study was conducted on factors influencing project completion while the current study was exclusively on the influence of project constraints on completion of projects. Langat study was conducted in Bomet County while the current study was conducted in Nakuru County.

Summary of the Reviewed Literature

The study was informed by the theory of constraint, the project competency theory, and resource-based theory. The theory of constraint emphasizes on scope, time and cost management as the most important areas in project management. The project competency theory highlights the impact of competence on expected outcome or performance that is achieved as a result of applying a combination of knowledge, personal attitude, and skills and experience in a certain function. A competent project manager implements proper project management techniques, avoids misuse of management techniques, ensures commitment to the project, spends time to define the project and correctly plans activities in the project.,

V. RESEARCH METHODOLOGY

Research Design

The study used a descriptive survey research design. The descriptive design sought to examine the relationship between completion of building construction projects which was the dependent variable and the independent variables being management of scope constraint, management of resource constraint and management of time constraint.

Target Population

The target population were all the registered construction companies in Nakuru County. The unit of analysis was building construction companies registered with National Construction Authority in Nakuru County while the unit of observation was project managers or quantity surveyors from the targeted construction companies. According to National Construction Authority records there are 1,664 registered construction companies of which 546 are building construction companies. The study targeted project managers or quantity surveyors. The researcher used one respondent in each of the company therefore the total target population was 546 respondents.

Sampling Technique

The study used Nassiuma's formulae to get a sample of 85 building construction companies. Nassiuma, (2000) as cited by Kilwake (2019) asserts that in most surveys, a coefficient of variation in the range of $21\% \leq C \leq 30\%$ and a standard error in the range $2\% \leq e \leq 5\%$ is usually acceptable. Therefore, a coefficient variation of 30% and a standard error of 3% were used.

$$n = \frac{NC^2}{C^2 + (N - 1) e^2}$$

Where: n = Sample size,

$$N = \text{Population} = 546$$

$$C = \text{Coefficient of variation} = 30\%$$

$$e = \text{Standard error.} = 3\%$$

$$n = \frac{546 \times 0.3^2}{0.3^2 + (546 - 1) 0.03^2}$$

$$n = \frac{49.14}{0.5805}$$

$$n = 84.6$$

Thus, the sample was 85

The study further adopted stratified random sampling from which the samples were allocated to various categories

Data Collection Instruments

Questionnaire was used to collect the primary data desirable for the study. The questionnaire contained structured questions which are the questions that the researcher has given the respondents the choices of the answers that the respondents can answer. The design of the questionnaire was based on a multiple-item measurement scale. A five-point Likert Data was employed, using a list of response categories ranging from strongly agree to strongly disagree.

Data Collection Procedure

The researcher first sought permission from Jomo Kenyatta University to go out and collect data in form of an introduction letter. After being granted the permission, the researcher then applied for authorization from National Commission for Science, Technology and Innovations (NACOSTI) to collect data from registered building contractors. With both the letters, the researcher then proceeded to visit the registered construction companies in Nakuru County, Kenya for introduction. On the scheduled dates, the researcher visited the respondents at their respective offices with the printed questions for distribution. The researcher then issued the questionnaires to the study respondents which were collected after two weeks.

Pilot Testing

The pilot study was carried in Nairobi County to assess the effectiveness of the data collection instruments before venturing fully into data collection. This consisted of 9 project managers and senior supervisors, a representation of at least 10% of the sample size for the study is recommended by Sekaran and Bougie (2011).

Validity of the Instrument

The validity of this study was enhanced in search of views of experts in the field of study especially with the research supervisor. According to Cooper and Schindler (2011), pre-testing is a good way to eliminate the probability of face validity.

Reliability of the Instrument

Reliability in this study was enhanced by pre-testing the questionnaire with a selected sample which was not included in the main study. An internal consistency technique was adopted by utilization of Cronbach's Alpha. Internal consistency reliability is a measure of reliability employed in evaluating the level by which various test items that probe the same construct produce similar results.

Data Analysis and Presentation

The data that was gathered in this study was quantitative in nature and was analyzed by utilization of Statistical Package for Social Sciences (SPSS). Descriptive and inferential statistics were employed in the study. Descriptive statistics involved the use of percentages, frequencies, measures of central tendencies (mean) and measures of dispersion (standard deviation). Inferential statistic involving the use of correlation analysis to establish the nature of the affiliation amongst variables at a generally accepted conventional significant level of $P < 0.05$ (Gall, Borg & Gall, 2013)

Data Collection Procedures

The researcher sought a permit from the National Council of Science and Technology and Innovation (NACOSTI) through Kenyatta University. The researcher then formally contacted the respondents through the Nakuru County Director of Education and explained to him the purpose of the study in order to seek respondent's cooperation. The researcher and his assistants explained to the respondents on how to fill the questionnaires and then administered them.

Data Analysis

Before the process of data entry was initiated all the questionnaires, interview schedules and focused group discussions were sorted and a unique identification number assigned to each tool. These numbers were entered and used as a check out for any inconsistencies in the data. The researcher went through all the data selected and summarized them. The study collected both qualitative and quantitative data. Qualitative data acquired from student focused group discussions and interviews for deputy head-teachers. This is where the main topics, subjects, concepts or themes that

came up in the study were identified and analyzed. This was followed by analysis of the contents within the themes identified. The results were then tabulated for easy interpretation so as to explain and interpret the various results given by the respondents.

VI. FINDINGS

Response Rate

The researcher administered 85 questionnaires for data collection from the 85 questionnaires, 62 were properly filled and returned. This was a representation of 70%. Trex, (2012) asserts that a response rate of 50% is adequate 60% is good and 70% and above good for analysis. This implies that 73 percent response rate was very appropriate for data analysis.

Demographic Information

Table 4.1: Duration of Service in the Construction Industry

Duration of Service	Frequency	Percentage
Less than 1 Years	0	0
1-5 Years	8	13
6-10 Years	12	19
More than 10 years	42	68
Total	62	100

From the findings 13% of the respondents had been working in the construction industry for 1-5 years, 19% of the respondents had been working in the construction industry for 6-10 years, while 68% of the respondents indicated that they had been working in the construction industry for more than 10 years. Novo, landis and Haley, (2017) found that performance increases with increase in years of experience, thus from our study most of the respondents were competent.

Table 4.2 : Category of Registration

Category	Frequency	Percentage
NCA 1	0	0%
NCA 2	0	0%
NCA 3	5	8%
NCA 4	7	11%
NCA 5	8	13%
NCA 6	12	19%
NCA 7	19	31%
NCA 8	11	18%
Total	62	100

The findings revealed that 8% of the construction companies were in NCA category 3, 11% of the construction companies were in NCA category 4, 13% of the construction companies were in NCA category 5, 19% of the construction companies were in NCA category 6, 31% of the construction companies were in NCA category 7, while 18% of the construction companies were in NCA category 8. According to the findingd, majority of construction firms under study were in NCA category 7. A study by National Counstruction Authority (2011) revealed that the construction sector is dominated by small and medium enterprise contractors which account for a total of 79% while large establishment contractors account for 21%.

Descriptive Findings and Discussions

Scope Constraint

Table 4.3: Management of scope constraint on Completion of Building Construction Projects

Statement	SA %	A %	N %	D %	SD %	Mean	Std
Management of scope constraint results to reduces cases of wastage of project input	26	47	17	10	0	3.887	0.907
Lack of proper scope definition affect the total project cost	37	45	13	5	0	4.113	0.870
Lack of proper scope planning affects completion of building construction projects	55	42	3	0	0	4.516	0.565
An increase in project activities result to an expanded project scope	57	37	6	0	0	4.500	0.621
Scope constraints is attributed to inadequate project funding	39	44	11	6	0	4.145	0.866

The Findings established that majority of the respondents (73%) were in agreement with a mean of 3.887 within standard deviation of 0.907, that management of scope constraint results to reduce cases of wastage of project input. The findings are in line with Egal (2012) study which found that project scope enlists structure of a project and base of their related factors especially cost and time thus preventing wastage of project inputs. The findings also observed indicated that (82%) were in agreement that lack of proper scope definition affect the total project cost which consequently affect project completion with a mean of 4.113 and the standard deviation of 0.870. According to Project Management Institute (2018), project scope defines the distinct product, service, and results that a project will deliver. Scope forms an overview of stakeholders' requirements concerning a project. Project scope management means the procedure of ensuring that a project comprises all of the necessary activities for the achievement of project objectives. Further, Ajibade, (2015) noted that a complete definition of the scope of a project upfront during early stages ensures smooth and successful implementation during the project execution.

The study also established that (97%) agreed that lack of proper scope planning affects completion of building construction projects with a mean of 4.516 and the standard deviation 0.565. The findings are in tandem with Shahnazari (2013) study which noted that inadequate pre-project planning and poor scope definition emerge as major causes of expensive changes, delays, rework, cost overruns and schedule overruns, and they often lead to project failure. From the findings (94%) agreed that an increase in project activities result to an expanded project scope which affect project completion with of mean 4.500 and the standard deviation of 0.621. Majority of the respondents agreed scope constraint is attributed to inadequate project funding with a mean of 4.145 and the standard deviation of 0.866.

The findings indicate that the standard deviation ranged from 0.565 to 0.907 indicating that the dispersion of the respondents from the mean was minimal. The findings are in line with Chen and Yang, (2016) study which found that, inadequate or poor scope definition negatively correlates to project performance, has long been recognized as a significant problem. If boundaries are not appointed, final project costs tend to be higher because of changes that interrupt project rhythm, cause rework, increase project time, and lower the productivity as well as the morale of the field work.

Resource constraint

Table 4.4 :Management of resource constraint on Completion of Building Construction Projects

Statement	S A %	A %	N %	D %	SD %	Mean	Std
Constraint in human resources results to delay in the completion of construction projects	52	39	9	0	0	4.419	0.667
Constraints in financial resources affect the overall quality of construction project.	37	31	19	13	0	3.887	1.073
Alternative source of funds helps project managers counter financial constraints	44	40	6	10	0	4.177	0.932
Financial constraints cause project managers shift the project start times to maximize use of critical resources	37	39	10	14	0	3.984	1.032
Project managers tend to change priorities of project activities in case of resource constraints	42	39	11	8	0	4.145	0.921
Project manager outsources human skills in case of human resource constraints.	37	44	16	3	0	4.145	0.807
Material constraints results to project managers reducing the scope of the project	55	33	7	5	0	4.387	0.869
Project managers reduce the number of workers in times of materials constraints	44	50	6	0	0	4.371	0.607

The findings observed that a majority of the respondents agreed (91%) that constraint in human resources results to delay in the completion of construction project with a mean of 4.419 and a standard deviation of 0.667. Further the findings indicated that majority of the respondents (68%) agreed that constraints in financial resources affects overall quality of construction project with a mean of 3.887 and the standard deviation of 1.073. The findings are consistent with Takim, (2016) study which noted that one of the main causes of project failure is the lack of effective human resource management practices. The researcher also revealed that poor cash flow management is the most significant factor that leads to a project's delay followed by late payment, insufficient financial resources and financial market instability. Contractors' instable financial background, client's poor financial and business management, difficulties in obtaining loan from financiers and inflation were identified as the most significant underlying cause of poor-quality projects. According to Ahmed and Alaghbari (2015) study the possible financial-related factors that lead to delays in Malaysian construction projects are financial problems of clients such as delayed payments, financial difficulties and economic problems; financial and cash flow problems of contractors; and external factor of poor economic conditions such as currency and inflation rate. In addition, difficulties in obtaining loans and short of funding are adverse financial-related factors that lead to project delays and low-quality construction projects.

Moreover, the findings indicated that majority of the respondents (84%) agreed that by having an alternative source of funds it helped project managers counter financial constraints with a mean of 4.177 and a standard deviation of 0.932. Kiarie, (2017) noted that the most common constraint in project management is the uncertainty of forthcoming funds even when the budget has been approved. However, lack of funds can be solved by getting loans or grants from aid agencies or banks but work has to be done by people, especially people in the field. Additionally, majority of the respondents agreed that financial constraints causes project managers shift the project start times to maximize use of critical resources with a mean of 3.984 and a standard deviation of 1.032.

From the findings, 81% of the respondents also indicated that project managers change the priorities of project activities in case of resource constraints with a mean of 4.145 and a standard deviation of 0.921. The study findings agree with Liisa, (2016) study which noted that projects mangers shifted their priorities during the time of recession where most of the labor resources were constraint to ensure continuity of some of the project scopes.

In addition, (81%) agreed that project manager outsource human skills in case of human resource constraints with a mean of 4.145 and a standard deviation of 0.807. Majority of the respondents (88%) also agreed that material constraints results to project managers reducing the scope of the project with a mean 4.387 and a standard deviation of 0.869. Finally, (94%) of the respondents agreed that project managers tend to reduce the number of workers in times of materials constraints with a mean of 4.371 and a standard deviation of 0.607. According to (Azhar, 2017) limitless material resources are not only unavailable most of the time, they may actually be a hindrance and remaining lean and mean can often ensure the continuity of project success.

Table 4.5 Completion of Building Construction Projects

Statement	S A %	A %	U %	D %	SD %	Mean	Std
Majority of our client are satisfied by the quality of the project	37	34	10	16	3	3.855	1.185
Our company is able to complete most of the project on time	55	34	8	3	0	4.403	0.778
Cases of cost overruns has greatly reduced	44	46	7	3	0	4.307	0.738
Majority of our projects have not experienced cases of delay.	55	33	7	5	0	4.387	0.869

The findings observed that (71%) agreed that majority of clients are satisfied by the quality of the project with a mean of 3.855 and within a standard deviation of 1.185. Majority of the respondents (89%) also agreed that the company is able to complete most of the project on time with a mean of 4.403 and a standard deviation of 0.778. They further agreed (90%) that cases of cost overruns have greatly reduced with a mean of 4.307 and a standard deviation of 0.738. According to Olatunji, (2010) 50% of construction projects experience time overruns and approximately 63% of all information systems encounter substantial budget overruns with the value of overruns “typically between 40-200%.” Cost of implementation will escalate and capital will remain tied in such a project until it is completed. Additionally,(88%) of the respondents agreed that majority of projects have not experienced cases of delaywith a mean 4.387 and a standard deviation of 0.869. When the project is not completed according to the initial time plan, a delay occurs. A delay is the postponement of time from the original estimated completion time which might be caused by the contractor, owner or consultant as well as external factors. According to Sambasivan (2016) various factors play out to determine if the project will be implemented successfully. It is however established that investors have an interest in project being completed in a timely way and according to the budget and that it will meet quality expectations. Most projects are however completed more or less to specification, although they are seldom on time and within budget. Ayudhya (2011) continues to state that contract disagreements may lead to both delay and cost overruns in early stages of construction. Cost overruns due to delay in contract duration can run into a considerable percentage of the contract value.

Test for Multicollinearity

A multicollinearity test was carried out to ensure that the independent variables did not have co-linearity amongst themselves. The existence of a high degree of association between independent variables is said to be a problem of multicollinearity which results into large standard errors of the coefficients of the affected

Table 4.6 Tolerance and VIF Test

	Tolerance	VIF
1 (Constant)		
Management of scope constraint	.552	1.813
Management of resource constraint	.439	2.277

a. Dependent Variable: Completion of building construction projects

From the findings, the variable management of scope constraint had a tolerance of 0.552 and a VIF of 1.813, management of resource constraint had a tolerance of 0.439 and a VIF of 2.277. Since the tolerance for all the variables was more than 0.1 and the VIF was not more than 10 therefore there was no need of further investigations

Correlation between Management of scope constraint and Completion of Building Construction Projects

The study sought to establish the correlation between management of scope constraint and completion of building construction projects in Nakuru County

Table 4.7 Correlation between Management of scope constraint and Completion of Building Construction Projects

		Completion of Building Construction Projects
Management of scope constraint	Pearson Correlation	.443*
	Sig. (2-tailed)	.013
	N	62

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

As indicated in Table 4.7, the study indicates that there was a positive and statistically significant correlation between management of scope constraint and completion of building construction projects in Nakuru County. ($r = 0.443$; $p < 0.05$). The study agreed with Bandra and Pretorius (2014) study which found that there is a significant direct correlation between scope definition and the corresponding performance of the sampled infrastructure projects in Malawi’s private implementing agencies.

Correlation between Management of resource constraint on Completion of Building Construction Projects

In addition, the study sought to establish the correlation between management of resource constraint and completion of building construction projects in Nakuru County.

Table 4.8 Correlation between Management of resource constraint on Completion of Building Construction Projects

		Completion of Building Construction Projects
Management of resource constraint	Pearson Correlation	.441*
	Sig. (2-tailed)	.016
	N	62

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

As indicated in Table 4.8, the study indicates that there was a positive and statistically significant correlation between management of resource constraint and completion of building construction projects in Nakuru County. ($r = 0.441$; $p < 0.05$). This implies that better management of resource constraint enhances completion of building construction projects in Nakuru County. The finding agrees with Gachuga, Kule and Ndabaga (2016) study which found that there was a positive relationship between funds allocation and project performance in Rwanda.

Table 4.9: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.038	.145		.260	.796
1 Management of scope constraint	.245	.104	.179	2.356	.022
Management of resource constraint Regulation	.233	.081	.245	2.877	.016

The interpretations of the findings indicated follow the following regression model.

$$Y = 0.038 + 0.245X_1 + 0.233 X_2 + e$$

According to the intercept (β_0), when the three independent variables are held constant, the value of completion of building construction projects in Nakuru County will be 0.038. In addition, holding all the other independent variables constant, a unit increase in management of scope constraint would lead to a 0.245 improvement in completion of building construction projects in Nakuru County. Further, holding on the other independent variables constant, a unit increase in management of resource constraint would lead to a 0.233 improvement in completion of building construction projects in Nakuru county.

Hypothesis Testing

The study sought to test the hypothesis that: **H₀₁**: Management of scope constraint has no statistically significant influence on completion of building construction projects in Nakuru county. From the findings the p-value was 0.022 which was less the 0.05 significant level. Therefore, based on the rule of significance, the study rejects the null hypothesis (**H₀₁**) and concluded that management of scope constraint has a significant effect on completion of building construction projects in Nakuru county.

The study sought to test the hypothesis that: **H₀₂**: Resource constraint management has no statistically significant influence on completion of building construction projects in Nakuru town. From the findings the p-value was 0.016 which was less the 0.05 significant level. Therefore, based on the rule of significance, the study rejects the null hypothesis (**H₀₂**) and concluded that resource constraints management has a significant effect on completion of building construction projects in Nakuru town.

VII. CONCLUSION

From the findings the researcher concluded that in most cases and increase in project activities result to an expanded project scope which affect project completion. It was also concluded that in most cases scope constraints is attributed to inadequate project funding. The results on the hypothesis revealed that management of scope constraint has a significant effect on completion of building construction projects in Nakuru County.

From the study it can also be concluded that in most cases project manager outsources human skills in case of human resource constraints. In case of material constraints project managers tend to reduce the scope of the project. Project managers tend to reduce the number of workers in times of materials constraints.

RECOMMENDATIONS

The researcher recommended that project managers should ensure that the project's scope is accurately defined and planned, this should be done during the initial stages of a project and should properly be documented in a scope statement. Proper management of scope will also lead to proper planning; this includes capturing and defining the work that needs to be done. Seeing that an increase in project activities results to an expanded project scope, its thus the responsibility of the project manager to ensure that only the required work will be done and that each deliverable is completed within allocated time and budget.

Suggestions for Further Research

The study suggests that a similar study should be conducted among other types of project such as irrigation projects.

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