

Determinants of Effective Implementation of County Construction Projects in Kenya: A Case of Nairobi City County.

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Abstract: *The study sought to examine the determinants of effective implementation of county construction projects in Kenya. The general objective of the study was to establish the determinants of effective implementation of county construction projects in Kenya. The target population of the study was all the 2,048 approved county construction projects in Nairobi City County in year 2015. The construction projects that were approved in the year 2015 consisted of 1,911 domestic buildings, 311 public buildings and 186 warehouses in Nairobi City County. A list of all the 2,408 approved building projects from Nairobi City County formed the sampling frame. The study adopted random sampling technique to select a sample size of 241 approved building projects from the total of 2,408. Structured questionnaires were used to collect data. The sample size of 241 projects represented 10% of the 2,408 approved county construction projects in Nairobi City County in the year 2015. Primary data was collected from project managers of the selected projects. Secondary data was collected from the library by reading related topics from journals and books. Primary data was collected by use of self-administered questionnaires. Data was collected during the implementation of county construction projects. Quantitative data analysis which included descriptive and inferential statistics were used to analyze the data collected. Descriptive statistics formed the basis of the research and included frequencies and percentages. Inferential statistics included use of multiple linear regression model and correlation. Results were presented in form of frequency distribution tables and pie charts. Qualitative data was analyzed through content analysis and presented in continuous prose form. The study was governed by four theories; Project management theory, Goal-setting theory of motivation, Core competence theory and logical framework model. The effect of staff competency, management support, stakeholder relationship and planning tools and techniques on the effective implementation of county construction projects was deduced from the results of the study. The findings of the study concluded that Staff competency has an effect on the Effective implementation of county*

construction projects in Kenya. The study also concluded that Management support influence the effective implementation of county construction projects in Kenya. Based on the study results, it was concluded that Project Planning Tools and Techniques influence effective implementation of County Construction projects in Kenya. From the study results it was concluded that the effect of stakeholder relationship on the Effective Implementation of County Construction Projects in Kenya is weak and not statistically significant. .

1. Introduction

The construction industry world over has experienced tremendous growth owing to increased demand for infrastructural facilities and housing (Kivaa, 2008). Construction is dated back to the history of humanity. It has evolved over centuries from dwelling in caves to skyscrapers and of late to intelligent buildings that perfectly respond to stimuli in the environment (Kehinde & Mosaku, 2006). Building practice has really changed to respond to the dynamic nature of human needs and progress. Korir (2013) observes that the adherence to the contract scope of work and contract sum is elusive in the construction industry. Cost and schedule overruns are very common in the Kenyan construction industry.

Githenya and Ngugi (2014) provide evidence that despite training of consultants and contractors in the construction industry in Kenya, the construction projects still do not meet key performance criteria. A manifestation of construction project failure is project cost overruns, delayed completion period and poor quality of project deliverables. These factors have resulted to collapsed buildings in Kenya, high cost of maintaining buildings, poor building designs, dissatisfied clients and nonfunctional buildings (Kogi, 2013). Building design and construction involve various professionals partnering to develop a facility over a short period (Anumba, 2006). The building industry may be divided into three major phases: the design phase, the construction phase and the operation phase (Horsely, France & Quater, 2003). Most decisions are made in the design stage to

meet the needs of the client. The construction phase is the most capital intensive phase and actualizes the building. The operation phase accounts for the longest period of the life of the building. Building involves a system that defines the procedure and standards for all the construction phases of the building process. The procedures outline the responsibilities and interaction among the construction industry professionals. These are engineers, builders, architects, landscapers, consultants, quantity surveyors, land surveyors, and estate managers.

1.1.1 Global Perspective of Construction Project Implementation

The world has embraced improvement in technology with advances in information and computer technology. The architecture, engineering and construction (AEC) industry recently developed Building Information Modelling (BIM) technology. BIM technology develops an accurate virtual model of a building digitally called building information model (Azhar, 2011). The model is used for planning, design, construction and operation of the building. BIM makes it possible for architects, engineers and constructors to visualize the 3-dimensional building design in a simulated environment. BIM technology identifies potential design, construction or operational challenges. The technology integrates the roles of all stakeholders on a project and is a new paradigm within AEC industry (Sabol, 2008). BIM is a drawing and documentation tool that offers a platform for enhanced collaboration, change management and information support throughout the building lifecycle. The majority of the industry is using some form of BIM technology.

A survey by McGraw Hill Construction found that in 2008, 45% of architects, engineers, contractors and building owners surveyed used BIM on 30% or more of their projects (Steel, Drogemuller, & Toth, 2012). Usage of BIM is forecast to grow sharply in coming years (Azhar, 2011). The AEC industry is faced with the challenge of using BIM not only as a tool in design process but also as the interface for the exchange of information between the stakeholders in the project. Construction work is considered globally to involve the construction of new or existing commercial, industrial and domestic buildings or structures (Steel, Drogemuller, & Toth, 2012). Free market economy and technological advancement have transformed the world into a global village where goods and products move more freely. Project teams for construction projects are now a partnership of various professionals from widely distributed geographical areas (Sabol, 2008). The global construction industry is governed by global standards and quality

specifications. The global market accentuates the asymmetry between groups that have a huge capital base, great expertise, and mobility to prosper and those groups with challenges in skills, capital and mobility. Atolagbe (2009) saw globalization as a provider of opportunities for businesses to interact and grow (or fall). The linkup between the businesses corresponds to the status of the enterprises quality, popularity and demand.

Globalization is a trend that translates to immense competition and immense competition (Russel, 2000). The construction industry is still faced with challenges such as shortage of skilled labour, high cost of engaging managerial staff, shortage of building materials and security challenges. The construction industry is closely linked to the economy of every nation globally. It contributes to the economic growth of countries (James, Rust & Kingma, 2012). Construction workers are exposed to various health hazards. These include hazardous chemicals, working at height, confined space, excavations, falling objects, electricity, noise, hot works and dust (Smallwood & Ehrlich, 2001).

Construction firms therefore provide personal protective equipment and accessories to mitigate these hazards. The global construction industry is governed by quality management systems, occupational health and safety management systems and environmental management systems (Sabol, 2008). Building information modelling has now made it possible for experts to do in-depth sustainability analyses based on the building's form, materials, context and mechanical-electrical-plumbing (MEP) systems. The world has now adopted sustainable building rating systems such as Leadership in Energy and Environmental Design (LEED) due to technology advances brought by BIM (Azhar, Carlton, Olsen & Ahmad, 2011).

1.1.2 Local Perspective of Construction Project Implementation

Kenya has registered a thriving construction Industry in recent years with a growth of 13.6 per cent in 2015 compared to an expansion of 13.1 per cent recorded in 2014 (ESR, 2016). Kenya's building and construction industry is rated as the fastest growing sector contributing about 10% of the gross domestic product (Kivaa, 2008). Building and construction is a priority area for infrastructure development for both the national and county governments. The Kenyan government has initiated several major projects since the 2014/15 financial year. These projects include construction of phase 1 of the Standard Gauge Railway (SGR) at KShs 327 billion for the 609KM from Mombasa to Nairobi to be commissioned on July 2017, feasibility studies and preliminary design for phase 2 of SGR at a total

cost of KShs 143.8 billion to Naivasha. Replacement of line 5 of the Mombasa-Nairobi pipeline with a new 20 inches diameter pipeline also began in 2014/15 financial year. Construction of Terminal 1A at Jomo Kenyatta International Airport was commissioned in the year 2014/15.

The year 2015 registered a growth of 13.6 per cent for the construction industry from 13.1 and 5.8 per cent for the years 2014 and 2013 respectively (ESR, 2016). Total expenditure for the state department of infrastructure rose by 37.6 per cent to KShs 120.5 billion in 2014/15. Development expenditure on roads rose to KShs 94.7 billion in 2014/15 from KShs 64.4 billion in the financial year 2013/14. The Kenya Roads Board (KRB) disbursed more funds for road repair and maintenance activities to KShs 26.2B in 2015/16 from 25.8B for 2014/15.

The National Housing Corporation completed 243 residential units in Nairobi at a cost of KSh 502.1 million in 2014 from the 376 units in 2013. The actual government expenditure on housing increased from KShs 3.5 billion in the financial year 2012/13 to KShs 6.1 billion in 2013/14 (ESR, 2015). Nairobi City County (NCC) registered an increase in value of reported new building works completed by 16.07 per cent to stand at KSh 68.6 billion in 2015 from KSh 59.1 billion in 2014 and KSh 52.3 billion in 2013 (ESR, 2016). Cement consumption increased by 21.8 per cent in the year 2014 compared to the year 2013. The value of approved plans increased from KShs 190.6 billion in 2013 to KShs 205.4 billion and KShs 215.2 billion in the years 2014 and 2015 respectively. While the total number of private buildings reported as completed increased by 9.9 per cent to 6,946 in 2014 from 6,323 in 2013. The building and construction industry in Kenya is very vibrant and has registered significant accelerated growth (ESR, 2016).

The buildings in Kenya are classified based on the building code 1911 as Domestic Class (domestic building, commercial developments and offices), Public Class (religious buildings, social halls, libraries, schools) and Warehouse Class (factories, industries and go downs). In the year 2015 a total of 2,408 planning applications were approved for construction in Nairobi County alone. The value of the approved permits represented over 152.2 billion Kenya shillings worth of development projects and permitting fees of over 1.5 billion Kenyan shillings for Nairobi County. These figures are significant. Domestic Class formed 79.4% of the total approved projects, Public Class formed 12.9% of the total approved projects while the Warehouse Class was 7.7% of the total 2,408 approved projects for construction (ESR, 2015). Studies have established that most buildings in Kenya do not meet the approved designs and regulations by the National Construction Authority (NCA) leading to cost

overruns and prolonged project duration (Gacheru, 2015).

The Kenyan construction industry relies largely on the use of manual labor in the construction sites. Kivaa (2008) highlights the number of people employed by the construction industry to be about 1 million people. The challenges that are facing the construction industry are mainly attributable to contractor failure to follow regulations and design leading to time and cost overruns. Collapsed buildings and structures, cost and schedule overruns have caused deaths and huge losses to the building and construction industry in Kenya. Gwaya, Masu and Wanyona (2014) established that the delivery of project materials to site, adequacy of supervision and the motivation of the project teams are major factors that affect the labor intensive construction industry in Kenya.

The construction process in Kenya may involve the erection, repair and demolition of buildings, roads and structures (Pakseresht, Afshin, & Gholamreza, 2012). The key inputs to the construction industry are: materials, labor, capital, entrepreneurship, equipment and technology. These factors are key success factors to the productivity of the project. The client's perspective of increased productivity in the building and construction industry in Kenya is defined by lower construction costs, shorter project construction durations, better quality deliverables, and value for money and better returns on investment (Helgason, 2010). The contractor's perspective of increased productivity is a more satisfied client, achievement of a sustainable competitive advantage over rival contractors and increased profits.

1. 2 Statement of the Problem

Despite the challenges facing the building and construction industry, the sector has recorded significant growth (ESR, 2015). The Kenyan AEC sector is faced with myriads of challenges ranging from collapsed buildings, uninspected houses to substandard buildings. Actual expenditure on housing by the National Housing Corporation went down to KSh 5.9 billion in 2014/15 from KSh 6.1 billion in 2013/14 due to fewer projects completed (ESR, 2016).

Housing projects completed were worth KSh 5.9 billion against an approved expenditure of KSh 7.4 billion for the financial year 2014/15 (ESR, 2016). The coefficient of determination for construction projects in Tanzania is 0.2762 showing that 27.62% of the variations in cost overruns are attributed to schedule overruns. Korir (2013) established that poor performance of construction projects in Kenya leads to project delays of up to 184.7% and cost overruns of up to 152.3%. Kogi (2013) established that project

cost overrun is a persistent problem in the construction industry and recommended that measures be taken to control project costs. Gacheru (2015) attribute building collapse to poor designs, non-compliance to specifications, cost cutting by contractors, use of substandard material, unqualified technicians, poor or lack of quality control and incompetent contractors. A study of major projects in Kenya has shown that almost all projects suffer from poor quality deliverables, schedule and cost overruns (Kibuchi, 2012). Githenya and Ngugi (2014) established that project control measures significantly determined the implementation of housing projects in Kenya with a correlation coefficient of 76.6 per cent. The study recommended that project managers take adequate control measures over every aspect of the project.

A study by Gacheru (2015) established that even the regulator of the Kenyan building and construction industry, National Construction Authority (NCA) is facing challenges of lack of capacity in human resource and fails to regularly inspect construction projects. Studies done to investigate factors influencing building completion of building projects in Kenya established a positive relationship between completion of building projects and business related factors, project procedures, project management factors and human related factors (Wanjau, 2015). This study sort to investigate the determinants of effective implementation of county construction projects in Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

The purpose the study was to examine the determinants of effective implementation of county construction projects in Kenya.

1.3.2 Specific Objectives

The specific objectives of this study were:

- 1) To assess the effect of staff competency on effective implementation of county construction projects.
- 2) To establish the effect of management support on effective implementation of county construction projects.
- 3) To determine the effect of stakeholder relationship on effective implementation of county construction projects.
- 4) To establish the effect of project planning tools on effective implementation of county construction projects.

1.4 Research Questions

- 1) How does staff competency affect effective implementation of county construction projects?
- 2) How does management support affect effective implementation of county construction projects?
- 3) How does Stakeholder relationship affect effective implementation of county construction projects?
- 4) How does project planning tools and techniques affect effective implementation of county construction projects?

2.0 Literature Review

This section explored on the literature related to the study. It covered the theoretical literature review, empirical literature review, and critical review of literature. The section also covered a critique of the existing literature relevant to the study, summary of literature and research gaps.

2.1 Theoretical Review

The implementation of construction projects has been hampered by various factors. Various authors have demonstrated these factors through their studies on the theories and models that explain the various determinants of effective implementation of county construction projects and how these determinants influence effective implementation of county construction projects. This study was guided by four theories: Goal-setting theory of motivation by Latham and Locke and Core competence theory by Prahalad and Gary Hamel, Theory of Project Management by Koskela and Howell and the Logical Framework Model originated by the United states' military. These theories argue out and explain the determinants of effective implementation of county construction projects.

2.1.1 Goal-Setting Theory of Motivation

The theory was developed after several years of research by Latham and Locke. The theory postulates that the most effective performance results when goals are specific and challenging. The theory predicts that commitment to attain goals is created by using specific and challenging goals to evaluate performance and to attain feedback on results. Latham and Locke (2002) explained three moderators that show the success of goal setting.

The first moderator is the importance of the expected outcome when goals are attained. This was meant to create agility in the human resource. Self-efficacy is a moderator that defines one's ability to achieve goals. The last moderator is commitment to others with a promise to achieve goals. The theory asserts the need to set group, individual and learning goals to improve on performance on goals. Goal setting is a means to sustain performance. The theory

found that individuals with set specific and challenging goals performed better than others with amorphous goals (Latham, 2003).

2.1.2 Core Competence Theory

The theory was proposed in 1990 by Prahalad and Gary Hamel. The theory of competence makes a case that core competencies enable the firm to introduce quality products and services that meet the needs of its customers (Prahalad & Hamel, 2006). These goods and products therefore differentiate the firm from its competition hence earning sustainable competitive advantage. Prahalad and Hamel (2009) emphasize that integration of multiple technologies and coordination of diverse production skills assists the organization to create value in its products and services. The theory postulates processes for developing core competencies in the organization. The strategy is to use the core competencies of the organization to invent new markets, exploit emerging markets and delight customers with products that meet their needs satisfactorily. The theory considers the firm as a tree. The trunk and major limbs of the tree are the core products and services. Smaller branches are business units.

To develop core competencies, the organization needs to articulate an intent that best describes the organization and its markets. The organization then builds core competencies by investing in technology, hiring talented individuals with requisite experience and passion to meet client needs and create structures and conditions that optimize employee performance. The organization supports the business units to build an image, customer loyalty, and access to distribution channels for their products. Forging strategic alliances also assist the organization to build core competencies (Prahalad & Hamel, 2006). The theory asserts the need for the organization's management to support the project effective implementation by investing in technology, training employees in relevant skills, hiring experienced employees, motivating employees and creating conducive working environment. This theory is linked to this study since it outlines the various stages of strategy implementation. Successful county construction project implementation needs timely acquisition of the required skills, development of core competencies and use of technology to achieve project deliverables (Githenya & Ngugi, 2014). It was assumed that if the project team had the required competencies (technical capabilities, experience, training and skills) then the implementation of county construction projects would be a success.

2.1.3 Theory of Project Management

Koskela and Howell (2002) explored the theoretical foundation of project management as

espoused in the PMBOK by PMI. The foundation is divided into a theory of project and a theory of management. The theory of project is provided by the transformation view on operations. The transformation view conceptualizes a project as a transformation of inputs to outputs. The theory explains the existence of a number of principles by which a project can be managed.

The principles suggest, for instance, decomposing the total transformation hierarchically into smaller transformations, tasks and minimizing the cost of each task independently. Koskela and Howell (2002) view management to be explained by three theories; management-as-planning, the dispatching model and the thermostat model. In management-as-planning, operational level management is seen to consist of the creation, revision and implementation of plans. Management-as-planning views a strong causal relationship between the actions of management and outcomes of the organization. The dispatching model assumes that planned tasks can be executed by a notification of the commencement of the task to the task executor. The thermostat model is the cybernetic model of management control that has the following components: there is a standard of performance; performance is measured at the output; the variance between the standard and the measured value is used to correct the process to meet the standard value (Koskela & Howell, 2002).

Project management is a cycle that views a project life cycle to consist of project initiation, project design, project planning, project implementation, project monitoring and control and project closure (PMI, 2013). In the context of the current study, the county construction project management undergo transformation through a life cycle. The projects are initiated, designed and planned and implemented. Project inputs that facilitate the execution of the county construction projects are in form of funds they get from the project financiers. Project finances are supposed to be used effectively to enable successful implementation of the county construction projects. The completion of the project is dependent on the achievement of the projected outputs as illustrated by the project management theory.

2.1.4 Logical Framework Model

The logical framework approach (LFA) is a very important tool in planning and managing county construction projects. The Logical Framework Model was originated by the US military as a planning approach for the US military operations. It was then adopted for the US space agency National Aeronautics and Space Administration (NASA). It was later adopted by United States Agency for International Development (USAID) for

development projects to improve project management of development projects (Anumba, 2006). Logical framework model uses a top-down approach to formulate a hierarchy of project objectives. At any given level in the logical framework model, the lower objectives are the means to satisfying the next higher level objectives toward a path to the ultimate project goal.

The model offers a hierarchy of project objectives that communicates clearly the project targets to the project team (MacArthur, 2011). Logical framework model assist in problem analysis, project planning and design, development of project objectives, project outputs and indicators. Logical framework model also assist the project team in the identification of project risks and assumptions while developing the overall project plan. Project success is determined by measuring the achieved objectives against a target as found by the project indicators of success (Montana & Charnov, 2011). This model is relevant to this study since it assists the project team

in project planning, evaluation and monitoring using the logical framework analysis tool in the effective implementation of county construction projects (Wanjau, 2015).

2.2 Conceptual Framework

Kothari (2004) defines a conceptual framework as a visual or written product that explains graphically or in a narrative form the main things to be studied as key factors, concepts or variables and the presumed relationship among them. The conceptual framework shows the independent variables which are the factors that were assumed to determine effective implementation of county construction projects. These independent variables shown include Staff competency, Management Support, Stakeholder Relationship, Planning Tools and Techniques while the dependent variable is effective implementation of county construction projects.

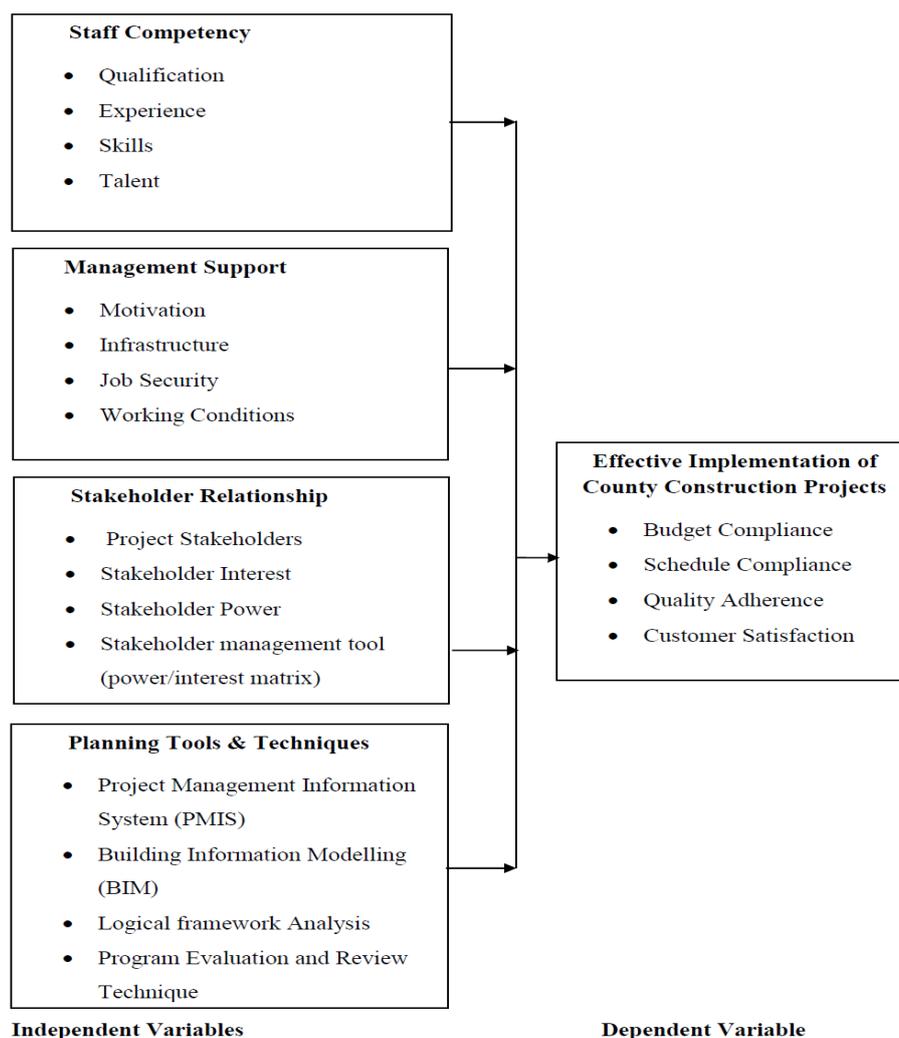


Figure 2.1 Conceptual Framework

2.3 Empirical review

2.3.1 Staff Competency and effective implementation of county construction projects

Trivellas and Reklitis (2014) sought to investigate the association of leadership roles' competencies, managerial effectiveness profile with gender and job outcomes (job satisfaction and performance). The study also sought to establish the influence of leadership competencies on individual effectiveness of managers and the course for action toward managerial excellence. Trivellas and Reklitis (2014) used a sample of 132 male and female managers in Greek firms to measure both leadership roles' competencies and managerial effectiveness. Structured questionnaires were used to collect data. The study established that managers characterized with high levels of job performance excel in practicing all leadership competencies while gender does not exert significant impact on job performance. Trivellas and Reklitis (2014) found that leadership competencies associated with the innovator, director and mentor roles contribute most to managerial effectiveness hence specific directions for managerial action need to be revived. The study proposed the following types of competencies: (1) specific competencies that refer to clusters of cognitive prerequisites that an individual need to acquire to perform adequately in a given substantive domain.

'Specific' competence refers to the profession or field specific knowledge and skills relevant to the tasks realized at the work environment (Weinert, 2001). Thompson et al (1997) argued that 'generic' competencies or skills like the ability to learn, communicate and teamwork skills should be developed. Generic competencies are advantageous in that they facilitate the transfer of existing specific competencies and the acquisition of specific competencies that can be used in new work environment. Abraham et al (2001) argued that all organizational functions require a set of essential managerial, generic and technical or functional competencies in order to be performed effectively.

The study revealed that managerial competencies are essential for managers with supervisory responsibility while generic competencies are crucial for all staff regardless of their function or level. The study explained that specific competencies are crucial in the performance of any job in the organization within a defined technical or functional area of work. Trivellas and Reklitis (2014) established that managers with high levels of leadership competencies produced enhanced level of job outcomes (job performance and job satisfaction). The study also revealed that higher performance is

believed to occur when the talent or capability of an employee is consistent with the needs of the job demands and the organizational environment. The research did not support a strong relationship between gender and either leadership competency or managerial effectiveness.

Kibuchi (2012) undertook to investigate how human factors contribute to the achievement of project goals such as quality, cost, time, client satisfaction and environmental sustainability. The study provided evidence that cost overrun, delayed completion period and poor quality exist in the construction industry in Kenya. The study was focused on the mental side of construction management and not the technological side of the enterprise. The study administered questionnaires to building consultants, contractors, and developers selected using a random sampling procedure. The study used both qualitative and quantitative methods to analyze data collected. The study used a cause effect regression analysis to find out if a relationship exists between human factors and performance by construction participants. The study established that there exist strong relationships between most of human factors that had been identified and project performance by project participants. Appreciation of members of staff by firm's supervisors showed the strongest correlation with $R^2 = 0.903$, followed by appreciation of members of staff by team members with $R^2 = 0.898$ while salary came third with $R^2 = 0.89$.

2.3.2 Management Support and effective implementation of county construction projects

Cohen (2009) established that the success or failure of a project is dependent on the top management support. Kwak and Ibbs (2002) established that World Bank Projects frequently fail to achieve their goals due to several problems that could be termed 'managerial' and 'organizational'. The challenges stated by the study are imperfect project design, poor stakeholder management, delays between project identification and start-up, delays during project implementation, cost overruns and coordination failures.

Ika, Diallo and Thuillier (2012) identified five critical success factors (CSFs) for World Bank projects' success. These CSFs are; (1) monitoring, (2) coordination, (3) design, (4) training, and (5) institutional environment. The study termed the five factors World Bank project supervision CSFs. The research established that there is significant positive relationship between each of the five CSFs and project success. Ika et al (2012) recommended that project supervision be refocused from demonstrating results to the much needed managing of objectives

for results in order to meet project, program and development goals of the project (Andersen, Grude & Haug, 2009). Too and Weaver (2014) argue that organizations can only create value in investment in projects through establishing clear links between the project outputs and the requirements of the organization's business strategy. Too and Weaver (2014) explain that organizations are better placed to realize their investment in projects and achieve the value defined by their business strategy if they have a structure in place for aligning the project deliverables with their organizational goals.

Too and Weaver (2014) proposed four key elements to improve the performance of the project and creation of value for the organizations. These are: (1) portfolio management that is focused on selecting the right projects and programs to support the organization's strategy, (2) project sponsorship that provides the direct link between the executive and the project manager with a focus on the whole project life cycle, (3) project management office (PMO) and (4) projects and programmes support that is focused on providing effective support. Management of projects and programmes is a measure of an effective governance system. The aim of the study was to provide guidance to organizations in the development of effective project governance to optimize the management of projects.

2.3.3 Stakeholder relationship and effective implementation of county construction projects

Tabassi and Bakar (2009) recommended training all construction industry participants, ensuring a stable supplier-buyer relationship, recruiting competent project staff and accurately estimating project time and cost. The other key consideration is project risks during planning, designing, scheduling and cost estimation. Nyaguthii and Oyugi (2013) sought to establish the influence of community participation on successful implementation of constituency development fund (CDF) projects in Kenya. The study was carried out in Mwea constituency, Kirinyaga County. Descriptive research was utilized to guide the study. Descriptive statistics were used for data analysis. The study established a need to involve community members in identification, implementation, monitoring and evaluation of CDF projects to boost project success. Maina (2013) established that stakeholders' participation in implementation of Economic Stimulus Programmes (ESP) influenced the success of education projects in Nakuru County.

Nyaguthii and Oyugi (2013) used descriptive research design. The target population was 350 stakeholders in all secondary schools in Nakuru County that benefited from Economic Stimulus

Programme. 84 subjects were purposively selected from BOG members, PTA, School principals, deputy principals, District Education Officers (DEO), school infrastructure committee members, project technical design members from the Ministry of Public works and project contractors. The study used self-administered questionnaires to collect data. The study conducted a pilot study in three ESP beneficiary schools in the neighboring Baringo County to ensure reliability of the instrument used. Descriptive statistics were used to analyze the qualitative data collected. Frequency distribution and percentage values were developed using SPSS software and findings presented in distribution tables. The research established a positive relationship between stakeholder participation in project planning, project implementation and participation in project monitoring, evaluation and success of the ESPs. Nyaguthii and Oyugi (2013) recommended that project facilitators clearly identify and train project stakeholders before initiation of similar programmes to aid in the success of the overall programme. Gituthu (2015) established a need to involve project stakeholders in the development of ICT solutions in the construction industry.

Organizations were also recommended to upgrade their ICT equipment to conform to the ever changing technology environment. A study by Choge and Muturi (2014) established a substantial relationship between contractors experience and adherence to cost estimates in the construction industry in Kenya. Choge and Muturi (2014) established that Poor distribution of labor and poor site management greatly affect the cost baseline. The study also established that adequate technical, managerial and communication skills were influence the adherence to cost estimates.

2.3.4 Planning Tools & Techniques and effective implementation of county construction projects

Jung and Joo (2011) sought to establish a building information modelling (BIM) framework focusing on the issues of practicability for real-world projects. The study purposed to enhance the effectiveness of construction projects throughout their lifecycle. A thorough literature review of computer-integrated construction (CIC) and BIM was performed so as to interpret BIM from a global perspective. The purpose of establishing a framework was to guide research efforts, to enhance communications with shared understanding and to integrate relevant concepts into descriptive or predictive model. Hartmann, Meerveld, Vosseveld and Adriaanse (2012) sought to establish ways of aligning building information model (BIM) tools and

construction management methods. The paper provides a case based evidence for the benefits of a technology pull view and for its practical feasibility in BIM based tool implementation settings.

The study researched on the BIM based tool implementation effort of two organizations as cases. The first case focused on the support of cost estimating activities with BIM based automated quantity take-offs. The second case focused on the support of project risk management activities with BIM 4D models - a BIM based technology that allows the visual simulation of planned construction activities over time. The cases illustrated that it was possible to align organization and technology through an in-depth understanding of the underlying project methods that guide the operation of a project team. The study also established that it was possible to align the existing functionality of BIM based tools with the project management methods. Barasa (2014) sought to establish the influence of project monitoring and evaluation tools on the completion of CDF funded projects in Kakamega County. The research employed a descriptive study. The target population of the study were all the 630 CDF projects' committee members that were 5040. The projects selected had a budget above 1 million Kenya shillings and were implemented between the year 2003 and 2013. The study established that 61.1% of the target population of 5040 project management committee members were conversant with aspects of logical framework analysis. Kahura (2013).

2.4 Critique of existing literature

A review of literature indicated that many studies on implementation of construction projects have been done. These include Nyaguthii and Oyugi (2013), Githenya and Ngugi (2014), Korir (2013), Kogi (2013), Choge and Muturi (2014), Rugenyi (2016), Gituthu (2015), Wanjau (2015), Maina (2013), Gacheru (2015) and Kibuchi (2012). Just a few studies concentrated on county construction projects in Kenya, instead they focused on projects such as KeNHA projects, small housing, and ICT application projects.

Literature review indicates that the studies focused on identifying the factors that affect the project teams implementing the projects like project managers, architects and employees. The studies do not show which factors determine the effective implementation of county construction projects and how the factors can be mitigated to close the projects within the triple constraints. The studies do not show the influence of the project stakeholders on the effective implementation of county construction projects and how the various factors interact to help the implementation of county construction projects succeed through inferential statistics such as regression modeling. This study attempted to seal the

gaps in the above studies with statistical rigor and greater focus in investigating the determinants of effective implementation of county construction projects in Nairobi City County.

2.5 Research Gap

Research has been done on the implementation of construction projects in Kenya and other construction industries across the world but very little has been done to assess the determinants of effective implementation of county construction projects in Kenya. Generally it is known that project cost overruns can be attributed to schedule overruns, lack of motivation of the project team, inadequate project resources, poor buyer-supplier relationship, but little has been done to analyze the effect of these factors on the effective implementation of county construction projects. Much of the city's growth has taken place without any definite urban development framework (K'Akumu & Olima 2007; Oyugi and Owiti 2007; Syagga 2011). Wanjau (2015) recommended that further studies be conducted by all building contractors to investigate the challenges facing implementation of building projects.

Rugenyi (2016) recommended further studies be undertaken to concretely identify and document the factors that positively determine successful management of triple constraints. Kibuchi (2012) recommended research be undertaken to establish the ideal levels of reward and remuneration equitable to the effort and changes in client demands over time which affects the performance of construction projects. Mandar and Pranay (2016) recommended that the construction industry need to be aware of planning. New techniques need to be introduced to reduce the problem responsible for time and cost overrun in construction projects (MacDonell, 2012).

Gituthu (2015) recommended further research on the influence of leadership skills, implementation of computer integrated design, and development of new tools to support concurrent practice and to assist architects in the conceptual stages on architects' performance. Maina (2013) suggested further research to include a comparative study of the influence of stakeholders' participation on the success of the ESP and similar programmes. Maina (2013) also recommended further research to establish the influence of other factors on the success of ESP education projects and other projects. This research was aimed at filling the gap that currently exists in the studies of building and construction projects by investigating the determinants of effective implementation of county construction projects in Kenya.

3.0 Methodology

Research design is the arrangement of the conditions for collection and analysis of data in a manner that aims to combine relevance to the research with economy in procedure. The research design is a plan that explains how data was collected to investigate the research questions in an economic manner. Kothari (2004) opine that research design assists the researcher to ascertain the relationship between the dependent variable and the independent variables. This research adopted a descriptive study to obtain information concerning current status of the phenomenon. The study described the empirical status of the variables at the various construction sites (Kogi, 2013). A descriptive study is appropriate since it contributes towards minimizing bias and optimizing on the reliability of data.

3.1 Population of the Study

Mugenda and Mugenda (2008) define population as a complete set of individuals, cases or objects with same observable characteristics. The population for this study were all the 2,408 approved building projects in Nairobi City County in the year 2015 (ESR, 2015). This consisted of 1911 domestic, 311 public and 186 warehouse building projects as shown.

Table 3.1: Target population (ESR, 2015)

Target Population	Frequency	Percent
Domestic Projects	1,911	79.36%
Warehouse Projects	186	7.72%
Public building Projects	311	12.92%
Total	2,408	100%

3.2 Sample and Sampling technique

A sampling frame is a comprehensive list of all sampling units from which a sample can be selected (Kothari, 2004). The study adopted random sampling technique to select a sample size from the 2,408 approved building projects to represent the target population. In each of these projects there were a number of different professionals who were involved in the implementation of the project to ensure project performance. The study focused on the project manager who was linked to the project and had diverse knowledge on the project outcomes and thus was able to identify the factors that determine effective implementation of county construction projects. Mugenda and Mugenda (2008) opine that for any meaningful study, a sample of 10% to 30% of the target population is adequate. 241 respondents were randomly selected for this study. This formed 10% of the target population. Data was collected

using structured questionnaires. The questionnaires were used to retrieve attitudes, values, feelings and emotions of 241 project managers.

4.0 Findings and Discussion

The total number of questionnaires that were administered was 241. A total of 200 questionnaires were properly filled and returned. This represented a response rate of 82.99% as shown on Table 4.1. Rubin & Babbie (2010) asserted that return rates of above 50% are acceptable to analyze and publish, 60% is good, 70% is very good while above 80% is excellent. A response rate of 82.99% is therefore excellent for the study and was fully representative of the target population (Rubin & Babbie, 2010).

4.1 Demographic factors against study variables

Demographic characteristics sought from the respondents by this study consisted of information that describes gender of the respondent, age, and length of service in the organization. Majority (80%) of the respondents indicated that they were males while only 20% were females. This implies that majority of county construction projects are managed by male project managers despite the governments push to have two third gender representation in employment (Kramon & Posner, 2011). There is therefore a need to sensitize more women to pursue architecture, engineering and construction (AEC) courses in the institutions of higher learning.

54% of the respondents indicated that they were aged between 30-39 years. Another 28% of the respondents were aged between 21-29 years. 18% of the respondents indicated that they were aged between 40-49 years. This implies that majority of the respondents (54%) were aged between 30-39 Years and were very much experienced and knowledgeable in effective county construction project management according to the research studies cited in the literature review (Weinert, 2001).

Results revealed that majority of the respondents (54%) had worked in the organization between 6-10 Years. 28% of the respondents had served in the organization for less than 5 years, while 18% had worked in the organization for 11-20 years. The study did not find respondents who had worked in the projects for over 21 Years. The study results indicate that majority of the respondents had worked in the organization for between 6-10 Years and had great leadership competence in county construction projects to manage the project activities and achieve deliverables as observed by scholars. Trivellas and Reklitis (2014) established that higher performance is believed to occur when the capability of an employee is consistent with the needs of the job demands and the organizational environment.

4.2 Descriptive Statistics

4.2.1 Staff Competency

The respondents were asked to indicate how staff competencies affect effective implementation of county construction projects in Kenya. The study sought to establish the highest level of education attained by the respondents. Results are as indicated in Table 4.2.

Table 4.2: Level of education attained

Level of education	Frequency	Percent
Secondary education	60	30
Diploma level	36	18
Undergraduate degree	64	32
Postgraduate degree	40	20
Total	200	100

Results in Table 4.2 show how respondents indicated the highest level of education they attained. 30% of the respondents indicated that they attained Secondary education, 18% of the respondents indicated that they attained diploma level, 32% indicated that they attained undergraduate degree. 20% of the respondents indicated that they had attained postgraduate degree. Table 4.2 indicates that all the respondents had attained at least secondary education. Abraham et al (2001) established that essential managerial, generic and functional or technical competencies are required to implement projects effectively. The respondents were asked to indicate how many years they had been actively involved in implementation of county construction project. Results are as presented in Table 4.3.

Table 4.3: Employee experience

Employee experience	Frequency	Percent
Less than 2 years	72	36
Between 2-5 years	72	36
More than 5 years	56	28
Total	200	100

Results revealed that 36% had less than 2 years' experience in the implementation of county construction projects. 36% of the respondents said they had between 2-5 years' experience in the implementation of county construction projects while 28% said they had more than 5 years' experience in the implementation of county construction projects. The results indicated that the majority of the project managers surveyed had been actively involved in

implementation of county construction projects for more than two years and were therefore competent. Weinert (2001) established that project managers required field specific competence and skills relevant to achieve the deliverables in county construction projects.

4.2.2 Management Support

The study sought to establish how management support affects the effective implementation of county construction projects in Kenya. The respondents were asked to indicate how the organization took care of its staff's individual needs. Results are as presented in Table 4.4.

Table 4.4: Staff needs

Level of satisfaction	Frequency	Percent
Great extent	56	28
Moderate extent	56	28
Low extent	52	26
Not at all	36	18
Total	200	100

Table 4.4 shows that 28% of the respondents were satisfied to a great extent with how the organization took care of staff individual needs, 28% to a moderate extent, 26% to a low extent and 18% not satisfied at all. The results of the study indicate that organizations still need to work on satisfying the specific needs of the project teams in a bid to have them fully concentrate their efforts in achieving project deliverables as observed by Too and Weaver (2014) who established that good project governance requires the management to invest in the development of effective capabilities to deliver the project functions. The respondents were asked to indicate their level of satisfaction with the working conditions provided by the organization. Results are presented in the Table 4.5.

Table 4.5: Working conditions for employees

Level of satisfaction	Frequency	Percent
To a large extent	64	32
To some extent	48	24
To a little extent	56	28
Not at all	32	16
Total	200	100

Results revealed that majority of the respondents (32%) were satisfied to a large extent by the working conditions provided by their organizations. Another 24% were satisfied to some extent by the working condition. 28% of the respondents were satisfied by the working conditions to a little extent while 16%

were not satisfied at all by the working conditions provided by their organizations. The results of the study indicate that organizations still needed to work on improving the working conditions of the project team. Githenya and Ngugi (2014) who established that motivation of project team has great influence in the implementation of housing projects and improvement of the working condition would motivate the project team.

4.2.3 Stakeholder Relationship

The study sought to determine the effect of stakeholder relationship on effective implementation of county construction projects in Kenya. The respondents were asked to indicate how they related with project stakeholders. Results are presented in the Table 4.6. Results showed that the majority (26%) of the respondents enjoyed a very good relationship with project stakeholders. 18% of the respondents indicated that they had a good relationship with project stakeholders. 24% of the respondents indicated that they had a relatively good relationship with project stakeholders. 20% of the respondents indicated that they had a bad relationship with the project stakeholders while 12% of the respondents indicated that they had a very bad relationship with project stakeholders. The study results showed organizations still need to work on improving the stakeholder relationship. Nyaguthii and Oyugi (2013) had established that participation of stakeholders in project implementation influenced success of the projects implementation process.

Table 4.6: Relationship with project stakeholders

Type of relationship	Frequency	Percent
Very good	52	26
Good	36	18
Relatively good	48	24
Bad	40	20
Very bad	24	12
Total	200	100

The study sought to determine how the organization promoted interaction with project stakeholders.

Table 4.7: Interaction with project stakeholders

Level of satisfaction	Frequency	Percent
To a large extent	56	28
To some extent	48	24
To a little extent	52	26
Not at all	44	22
Total	200	100

Results revealed that 28% of the respondents indicated that they interacted to a large extent with the project stakeholder during project implementation, 24% of the respondents indicated that they interacted with the project stakeholders to some extent while 26% indicated that they interacted with project stakeholders to a little extent. Another 22% said that they never interacted with the project stakeholders. It was shocking to realize that some project managers never interacted with project stakeholders at all. The study results indicated that organizations still needed to interact more with stakeholders so as to make them participate in the implementation of the project and boost project success as recommended by other studies. Sabol (2008) established that stakeholder interaction and collaboration in building projects' design and implementation influenced project success.

4.2.4 Planning Tools and Techniques

The study sought to establish the effect of planning tools and techniques on the implementation of county construction projects Kenya. The respondents were asked to indicate their level of skills in the use of planning tools and techniques in county construction project implementation. Respondents were also asked to indicate how much training on project planning tools was conducted by the organization yearly. Results for the respondents' level of skill on project planning tools and techniques are presented in Table 4.8.

Table 4.8: Level of skill on planning tools and techniques

Level of skill	Frequency	Percent
Very good	52	26
Good	56	28
Poor	56	28
Very poor	36	18
Total	200	100

Results revealed that 26% of the respondents indicated that they were very good with the application of project planning tools and techniques. Another 28% indicated that they were good on project planning tools and techniques. Another 28% indicated that they were poorly skilled on project planning tools and techniques. 18% of the respondents indicated that they were very poorly skilled on project planning tools and techniques. The study findings revealed that many organizations still needed to embrace technological advancements in the building and construction industry. Jung and Joo (2011) established that wholesome building design and implementation of sustainable building designs

were made effective using project planning tools such as BIM technology. The respondents were asked to indicate how many training on project planning tools and techniques were conducted yearly by their organizations. Results are as shown in Table 4.9.

Table 4.9: Trainings on project planning tools and techniques

Trainings on project planning tools and techniques	Frequency	Percent
Less than 2 times	64	32
Between 2-5 times	68	34
More than 5 times	68	34
Total	200	100

Results in table 4.9 revealed that 32% of the respondents indicated that less than 2 trainings were conducted on project planning tools and techniques yearly by their organizations. 34% of respondents indicated that between 2-5 trainings were conducted by their organizations yearly while another 34% of respondents indicated that more than 5 trainings were conducted yearly by their organizations on project planning tools and techniques. Table 4.9 above shows the results. The results of the study imply that training in project planning tools and techniques needs to be improved for project teams for them to embrace technological advancement and produce quality sustainable county construction projects as recommended by studies (Sabol, 2008).

4.2.5 Effective Implementation of County Construction Projects

The study sought to establish how county construction projects were implemented in Kenya. The study also sought to determine the frequency with which the respondents were able to deliver county construction project outputs. Further, the study sought to establish the level of satisfaction of the respondents with the implementation of county construction projects. The study sought to determine the frequency with which the respondents were able to deliver county construction project outputs. Results are as indicated in Table 4.10.

Table 4.10: Achievement of project outputs

Achievement of project outputs	Frequency	Percent
To a large extent	60	30
To some extent	60	30
To a little extent	56	28
Not at all	24	12

Total	200	100
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Results in table 4.10 revealed that 30% of the respondents achieved county construction project outputs to a large extent. Another 30% of the respondents indicated that they could only achieve some extent of the project deliverables. A further 28% of respondents indicated that they only achieved project outputs to a little extent while another 12% could not achieve county construction project output. The study results imply that the attainment of project deliverables still remain a challenge for the project teams and therefore embracing technological advancements in the building industry such as BIM should be considered by county project stakeholders as recommended by other studies (Kahura, 2013). The respondents were asked to indicate their level of satisfaction with the implementation of county construction projects by their organizations. Results are presented in Table 4.11.

Table 4.11: Level of Satisfaction with implementation of county construction projects

Level of Satisfaction	Frequency	Percent
Highly satisfied	88	44
moderately satisfied	72	36
Unsatisfied	40	20
Total	200	100

Results in Table 4.11 reveals that majority (44%) of the respondents indicated that they were highly satisfied with the implementation of county construction projects. Another 36% of the respondents said they were moderately satisfied with the project implementation. 20% of the respondents indicated that they were unsatisfied with how their organizations implemented county construction projects in Kenya. The study results imply that the project plan for most county construction projects need to be created in collaboration with all project stakeholders as recommended by Ansah and Agyei (2010). Maina (2013) established that the development of a project plan was necessary for effective project implementation and would fully capture stakeholder needs and expectations during and after project execution.

4.3 Inferential Statistics

Inferential analysis was conducted to generate the regression and correlation results. These regression results include the model of fitness, and analysis of the variance and regression coefficients.

4.3.1 Correlation Analysis

The results presented showed that there is a strong positive and statistically significant relationship between Staff Competency and Effective implementation of County Construction projects ($r=0.774$, $p=0.000$). This study result supports the findings of Trivellas and Reklitis (2014) who in their research established that it was essential for the project team to have field specific knowledge and leadership competencies to enhance project success. The correlation matrix indicates that there exist a strong positive and statistically significant relationship between Management Support and Effective implementation of County Construction projects in Kenya ($r=0.844$, $p=0.000$). This supports the finding of Cohen (2009) who established that the success or failure of a project is dependent on the top level management support. Similarly, the correlation matrix showed that there exist a strong positive relationship between Planning Tools and Techniques and Effective implementation of County Construction projects ($r=0.786$, $p=0.000$). This supports the findings of Barasa (2014) who established that project monitoring and evaluation tools influenced the completion of CDF funded projects. Adriaanse (2012) established that it was possible to align organization and technology through an in-depth understanding of the underlying project methods that guide the operation of a project team.

The Significance (2-tailed) level of 0.000 shows that there is a relationship of statistical significance between the independent variables: staff competency, Management Support, Project Planning Tools and techniques and the dependent variable: Effective implementation of County Construction Projects. The correlation matrix indicated that there exist a weak negative relationship between Stakeholder Relationship and Effective implementation of County Construction projects ($r=-0.12$, $p=.87$). The Significance (2-tailed) level is 0.87 which shows that the correlation is not statistical significant and therefore Stakeholder relationship and Effective Implementation of County Construction Projects are not linearly related. This finding contradicts the recommendation of other studies. Nyaguthii and Oyugi (2013) recommended that project facilitators clearly identify and train project stakeholders before the initiation of projects to aid in the success of the overall programme.

Results further established existence of a statistically significant and strong positive relationship between Management support and Staff Competency ($r=0.513$, $p=0.000$). The correlation matrix shows that there is a weak positive and insignificant relationship between Management support and Stakeholder Relationship ($r=0.034$, $p=.633$). The matrix shows that Management support

and stakeholder relationship are not linearly related. The correlation matrix shows that Management support has a strong positive and statistically significant relationship with Planning tools and Techniques ($r=0.749$, $p=.000$). This study result supports the findings of Azhar (2011) who established that planning tools influence the success of building projects.

The correlation matrix further shows that Staff Competency has a strong positive and statistically significant relationship with Project Planning tools and Techniques ($r=0.635$, $p=.000$). The correlation matrix also indicates that Staff Competency has a weak negative and statistically insignificant relationship with Stakeholder Relationship ($r=-0.037$, $p=.602$). The correlation matrix show that Stakeholder Relationship has a weak positive and statistically insignificant relationship with Planning tools and Techniques ($r=0.004$, $p=.952$). This study result contradicts the finding of Kibuchi (2012) who established that human factors contribute to the achievement of project goals. The results show that all the variables have perfect positive linear relationship with themselves hence a correlation coefficient of 1.

4.3.2 Regression Analysis

The results presented in Table 4.13 present the fitness of model used in explaining the study phenomena. Staff Competency, Management Support, Stakeholder Relationship and Planning tools and Techniques were found to be satisfactory variables in explaining Effective Implementation of County Construction projects in Kenya. The coefficient of determination (R square) was established as of 87.4%. This means that Staff Competency, Management Support, Stakeholder Relationship and Planning tools and Techniques about County construction implementation explain 87.4% of Effective Implementation of County Construction projects in Kenya. The results show that the model applied to link the relationship of the variables was satisfactory (Miles, Huberman & Saldana, 2013).

Table 4.12: Model Summary

Indicator	Coefficient
R	0.935
R Square	0.874
Adjusted R Square	0.872

Table 4.13 shows the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. The ANOVA table 4.13 indicates that the independent variables are good predictors of Effective

Implementation of County Construction projects in Kenya. The F statistic of 339.493 and the reported p value (0.000) that is less than the conventional probability of 0.05 significance level support the study. The $F_{cal} = 339.493 > F_{critical} = 2.424$ at $\alpha = 0.05$. This implies that Staff Competency, Management Support, Stakeholder Relationship and Planning tools and Techniques influence the Effective Implementation of County Construction projects in Kenya (Dov Dvir et al, 2003). This study results supports the findings of Githenya and Ngugi (2014), Keller (2006), Seboru (2006) and other scholars who established positive and statistically significant relationships between the independent variables and effective implementation of projects.

Table 4.13: Analysis of Variance

Indicator	Sum of Squares	df	Mean Square	F	Sig.
Regression	189.158	4	47.289	339.493	0.000
Residual	27.162	195	0.139		
Total	216.320	199			

Regression coefficients results in Table 4.14 shows that there is a positive and statistically significant relationship between the independent variables: Staff Competency, Management Support and Planning Tools and Techniques and the dependent variable: Effective Implementation of County Construction projects in Kenya. These independent variables therefore predict the dependent variable of the study (Lacey & Luff, 2001). This significant positive relationship between the three variables is supported by beta coefficients of 0.433 and a p value of 0.000 for Staff Competency, beta coefficient of 0.534 and a p value of 0.000 for Management Support, and a beta coefficient of 0.106 and a p value of 0.013 for Planning tools and techniques.

Study results in table 4.14 show that increased Staff Competency would result to increased Effective Implementation of County Construction projects in Kenya by 0.433 units. This result supports the findings of Seboru (2006) who established that staff competency is one of the most important success factors in ensuring construction project performance. Results in table 4.14 also show that an increase in Project Planning Tools and Techniques would result to increased Effective Implementation of County Construction projects in Kenya by 0.106 units. This result supports the findings of Choge and Muturi (2014) who established that there exist a substantial relationship between contractor experience and adherence to project cost.

The study results in table 4.14 further show that an increase in Management Support would result to increased Effective Implementation of County Construction projects in Kenya by 0.534 units. This

study result supports the findings of Olatunji (2010) who established that construction project success is determined by management support. The results in table 4.14 also show that an increase in Stakeholder relationship would result to a decrease in Effective Implementation of County Construction Project by 0.012 units. This study result contradicts the conclusion of Maina (2013) who established that participation of stakeholders in the implementation of ESP in Nakuru county projects would influence project success. Regression results in Table 4.14 also show that Stakeholder relationship has a negative and insignificant effect on the Effective Implementation of County Construction projects in Kenya. This is supported by a p value is 0.558. The multiple linear regressions equation used in this model was found to be:

$$Y = -0.291 + 0.534X_1 + 0.433X_2 - 0.012 X_3 + 0.106 X_4 - 0.0117$$

Where:

Y= Effective implementation of county construction projects

In the model, $\beta_0 = -0.291$, is the constant term. The coefficients were calculated by SPSS version 22 and found to be: $\beta_1 = 0.534$, $\beta_2 = 0.433$, $\beta_3 = 0.106$ while $\beta_4 = -0.012$ and were used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables X1, X2, X3 and X4. ϵ was the error term and was found to be 0.117. The error term captured the unexplainable variations in the model (Miles, Huberman & Saldana, 2013).

Table 4.14: Coefficients of Regression

Variable	B	Std. Error	t	Sig.
(Constant)	-0.291	0.117	-2.49	0.014
Management support	0.534	0.038	14.219	0.000
Staff Competency	0.433	0.034	12.872	0.000
Planning tools and techniques	0.106	0.042	2.51	0.013
Stakeholder relationship	-0.012	0.021	-0.58	0.558

5.0 Summary and Conclusion

Correlation results revealed that Staff competency had a strong positive and statistically significant effect on Effective Implementation of County Construction projects in Kenya ($r=0.774$, $p = 0.000$).

Regression results revealed that Staff competency had a positive and statistically significant effect on Effective Implementation of County Construction projects in Kenya. This was supported by a beta coefficient of 0.433 and a p value of 0.000. This

implies that an increase in Staff Competency would result to increased Effective Implementation of County Construction projects in Kenya by 0.433 units. These results agree with those of Trivellas and Reklitis (2014) who in their study established that managers with high levels of leadership competencies produced enhanced level of project outputs.

Correlation results revealed that Management Support had a strong positive and statistically significant effect on Effective Implementation of County Construction projects in Kenya with $r=0.844$ and a p value of 0.000. Regression results revealed that management Support had a positive and significant effect on Effective Implementation of County Construction projects in Kenya. This was supported by a beta coefficient of 0.534 and a p value of 0.000. This implies that an increase in management Support would result to an increase in Effective Implementation of County Construction projects in Kenya by 0.534 units. These finding is consistent with those of Cohen (2009) whose study result established that the success or failure of a project is dependent on the top management support.

Correlation results revealed that stakeholder relationship had a weak negative and statistically insignificant effect on Effective Implementation of County Construction projects in Kenya with $r=-0.12$ and a p value of 0.87. Correlation results showed that Stakeholder relationship and Effective Implementation of County Construction Projects are not linearly related. Regression results revealed that stakeholder relationship had a negative and statistically insignificant effect on Effective Implementation of County Construction projects in Kenya. This was supported by a beta coefficient of -0.012 and a p value of 0.558. This implies that an increase in stakeholder relationship would result to an insignificant decrease in Effective Implementation of County Construction projects in Kenya by 0.012 units. These findings are not consistent with those of Nyaguthii and Oyugi (2013) who sought to investigate the influence of community participation on successful implementation of CDF projects in Kenya.

The correlation results revealed that Project Planning Tools and Techniques had a strong positive and statistically significant relationship with Effective implementation of County Construction projects in Kenya. This was supported by a correlation coefficient of 0.786 and a p value 0.000.

Regression results revealed that Project Planning Tools and Techniques have a positive and statistically significant effect on Effective implementation of County Construction projects in Kenya. This was supported by a beta coefficient of 0.106 and a p value of 0.013. This implies that an increase in project planning tools and techniques would result to increased Effective implementation

of County construction projects by 0.106 units. These findings are consistent with those of Gituthu (2015) who sought to establish the influence of information technology (ICT) Applications on the performance of architects in the construction projects in the public sector, a case of the directorate of public works in Kenya.

5.1 Conclusion

The study concluded that Staff competency has an effect on the Effective implementation of County Construction projects in Kenya. The study also concluded that Management support influence the Effective implementation of County Construction projects in Kenya. Based on the results, it was possible to conclude that Project Planning Tools and Techniques influence Effective implementation of County Construction projects in Kenya. The study results further concluded that the effect of stakeholder relationship on the Effective Implementation of County Construction Projects in Kenya is weak and not statistically significant.

5.2 Recommendations

The study results revealed that management Support has a positive and significant effect on Effective Implementation of County Construction projects in Kenya. It is therefore recommended that top management support to project teams should be increased. Study results further revealed that Staff competency had a positive and statistically significant effect on Effective Implementation of County Construction projects in Kenya. It is recommended that staff competency be improved for all project teams engaged in county construction projects.

The results of the study also revealed that Project Planning Tools and Techniques have a positive and statistically significant effect on Effective implementation of County Construction projects in Kenya. It is therefore recommended that project planning tools and techniques be improved for all the project teams engaged in county construction projects.

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