Determinants of Completion of Government Funded Urban Construction Projects In Nairobi City County, Kenya

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ABSTRACT
In Kenya like other countries construction industry is one of major industry contributing significantly to the socio-economic development growth. The general objective of this study was to examine the determinants influencing project completion of government funded projects in Nairobi, Kenya. The specific objectives of this study were to examine; project cost; project procurement procedures; project Kenya designs and specifications and project contractors’ experience on project completion of the government funded urban projects. The study adopted descriptive survey and study population and sample of 68 was considered for this study. A census sampling technique method was used and data collected through the use of questionnaires. On the other hand, secondary data was obtained from published documents such as journals, periodicals, magazines and reports to supplement the primary data. The study variables were regressed at 5% level of significance and 95% confidence level to determine strength and direction of the their relationship. The analysis showed that project procurement procedures had the strongest positive (Pearson correlation coefficient = .703) influence on project completion of government funded projects. In addition, project design specifications, project contractors experience and project cost are positively correlated to project completion of government funded urban projects (Pearson correlation coefficient = .644, .493 and .532) The study recommends that that training on project contractors experience is crucial for project completion of government funded urban construction projects. There is need to enhance project design specification and project procurement procedures through the tendering systems, and monitoring and evaluation to reduce the project cost especially on the material cost, labour cost, equipment cost, control cost overruns and deficiencies on cost estimates on implementation of projects to enhance performance of the projects. Additionally, very little has been undertaken to explore the determinants studied on completion of government urban funded projects thus the researcher call for further studies to be undertaken on other factors and areas also in Kenya for generalization of the findings of this study.

Keywords: project procurement, urban funded projects, project contractors experience

INTRODUCTION
Construction has become an important player in the economy of many countries, especially developed countries. As mentioned by Olawale (2010), this industry contributes to the GDP and employment rate of many nations and for this reason it is considered vital for the economic development of any nation. The role the construction industry plays in socio-economic development is significant. It provides the basis upon which other sectors can grow by constructing the physical facilities required for the production and distribution of goods and services. The construction industry has a significant multiplier effect on the economy as a whole (Morris, 2008).

Delays and cost overruns in construction sector investments can raise the capital-output ratio in the sector and elsewhere bringing down the efficacy of investments (Morris, 2008). Thus, successful management of processes employed in acquisition of these assets is to a large extent, determined by the amount of resources expended, time taken and quality when compared to similar projects.
Infrastructure includes the capital required to produce economic services from utilities (like electricity, telecommunication, and water) and transport (roads, bridges, seaport, and airports) and is central to promoting economic activity (Chan, Scott & Chan, 2004). Individuals, private firms or public entities are continually engaging in acquisition of physical assets in various forms such as, residential, commercial buildings, hospital, schools/institutions, and development infrastructure like water, roads, electricity and telecommunication. These assets represent major capital investment motivated by market demands or perceived needs. To remain competitive in profit or non-profit engagements, these entities focus on processes and procedures that offer value and competitive advantage. Understanding the customer needs and appropriately deploying the available resources in meeting customer expectations offer competitive edge over competitors in product and service provision. Thus, efficient and effective resource management through appropriate use of tools and techniques in asset acquisition is critical. Customers are demanding for better quality product through efficient and timely deliveries at low price. It is therefore important, that time, cost, and quality of constructed facilities are efficiently managed in the entire project life cycle for effective service or product delivery.

Lin-lin et al., (2014) conducted a study on understanding of government funded projects in China's infrastructure and construction projects. They established that the development of public projects practices in China remains relatively slow despite the urgent need to promote this mechanism for solving socio-economic and environmental disputes in PIC projects. Thus, a four-step strategic plan is suggested to be established to overcome main barriers for the implementation of public participation and promote its development in China. Ektewan and Ogunlana (2006) did a study on public hearings in Thailand's infrastructure projects. They found that the projects had moderate to low effectiveness primarily because the participation and management performance aspects did not meet the participants’ expectations. The relationships of evaluation and satisfaction indices were examined. The hearing participants focus both on the process and outcome of hearings.

In Kenya like other countries construction industry is one of major industry contributing significantly to the socio-economic development growth. Achieving project completion on time, within budget, at specified quality standards, and most importantly without unprecedented cost escalations is major criterion of success of project. Generally, a project is considered successful if the project is completed within a stated cost or budget and time. Although the government of Kenya sets aside huge sums of money to be spent in construction sector, the industry is facing a lot of challenges such as the expenditure exceeding the budget, delay to complete the project in time, the building defects and over-reliance on foreign workers (RoK, 2012).

The construction infrastructure has been given the highest priority to ensure that the main projects under the economic pillar are implemented, for example according to the Ministry of Roads Service Charter (2008), there is a need for improvement of roads to a motorable condition because the road transport (mode of transport) carries about 80% of all cargoes and passengers in the country. Due to the importance of roads in socio-economic development of the country, the government has in the recent past steadily increased budget allocation to the road sub-sector. However, road projects in Kenya have been facing various challenges, which include delay in completion, cost overruns, demolition of residential and businesses houses and abortive works (Maina, 2013).

**Statement of the Problem**

The construction industry in Kenya is plays a very major role in the country's economic development through its contribution to gross domestic product (GDP), gross domestic capital formation (GDCF), creation of employment and production of capital facilities and assets required for production in other sectors, as creating demand for their products (UNCHS, 2006). According to Ahmed et al., (2012), the urban construction project is bound to fail due to slow rate in completion. This according to UNCHS, (2006), can result to losses of over 19.82%. Construction sector is purely a project based work and in management of project, the most critical thing is in time completion. The delays in project completion are a common problem in the construction industry not only with an immeasurable cost to society but also with debilitating effects on the contracting parties. The concept of delay in the substantial completion of construction projects is a global phenomenon. For instance, while evaluating the progress and reports of 28 highway projects constructed during the period 1996-1999 in Jordan, Battaineh (2006) observed that the average ratio of actual completion time to the
planned contract duration is 160.5% for road works. Seboru (2006), further citing other scholars also states that the time frame for major road projects worldwide to reach construction start stage have been observed to range from 10-30 years. Similarly, a study by United Nations Commission for Trade and Development (UNCTAD), (2001) on African construction industry’s turmoils and their implications for New Partnership for Africa’s Development (NEPAD) identified costly project delays as a major problem and identifies poor project time, quality and cost performance as a major issue. There is, therefore, a need to address the unpredictability of the successful completion of construction projects in terms of delivery time, cost and to the standard of quality expected. While several studies (Musa, 2009; Karimi, 2008; Tulakhaba 2008, Mwandali, 2006) have been done focusing on different aspects of project completions and further appreciating the crisis in every project in terms of completion, all empirical evidences are in short of the actual factors that influences the completion itself. Hence this study seeks to investigate the determinants of completion of government funded urban construction projects in Nairobi City County, Kenya.

**Objectives of the Study**
The general objective of the study was to establish the determinants influencing completion of government funded urban construction projects in Nairobi City County, Kenya.

The specific objectives of the study were to:

i. Establish the influence of project cost on completion of government funded urban construction projects in Nairobi City County, Kenya.

ii. Assess the influence of project design specifications on completion of government funded urban construction projects in Nairobi City County, Kenya.

iii. Determine the influence of project procurement procedures on completion of government funded urban construction projects in Nairobi City County, Kenya.

iv. Establish the project contractors experience on completion of government funded urban construction projects in Nairobi City County, Kenya.

**Research Questions**
The study sought to answer the following questions;

i. How does project cost affect completion of government funded urban construction projects in Nairobi City County, Kenya?

ii. Do project design specifications affect completion of government funded urban construction projects in Nairobi City County, Kenya?

iii. To what extent does project procurement procedures affect completion of government funded urban construction projects in Nairobi City County, Kenya?

iv. Does project contractors experience on completion of government funded urban construction projects in Nairobi City County, Kenya?

**LITERATURE REVIEW**

**Theoretical Review**
The Study will be guided by the theory of constraints, complexity theory, knowledge based theory and resource based theory.

**Knowledge-based Theory**
Knowledge-based Theory of Project Management states that there is no explicit theory of project management and as a result there is a general theory to underpin the discipline and is found in theories of management, planning, control and projects (Koskela & Ballard, 2002). There is ‘embryonic’ theory contained in literature, particularly his books (Turner, 2006). In response, it is noted that explicit theory is lacking (Sauer & Reich, 2007). Knowledge-based project management is the systematic and optimal arrangement and coordination of knowledge and knowledge configurations over a period of time to achieve specific objectives within certain constraints. This includes but not limited to include but not limited to project cost management, project risk management, and project integration management (Onions, 2007). The above theory instigated the first research question: To what extent does project cost affect completion of government funded urban construction projects in Kenya?
**Complexity Theory**
The second theory is the Complexity Theory. A prominent author in the field of complexity is Terry Williams who shares the view of other scholars on complexity but extends it by one additional dimension of cost estimates. In addition to the two components of complexity, vis-à-vis the number of factors and the interdependency of these factors, he introduces the third factor which is uncertainty. Since uncertainty adds to the complexity of a project, cost estimates therefore can be viewed as a constituent dimension of project complexity that can be as a result of various factors (Williams, 2008). The above theory instigated the second research question; Does project design specifications affect completion of government funded urban construction projects in Kenya?

**Resource Based Theory**
Resource-based theory has been developed to understand how organizations achieve sustainable competitive advantages (Barney, 1986). The theory focuses on the idea of costly-to-copy attributes of the firm as sources of business returns and the means to achieve superior performance and competitive advantage (Conner, 1991; Hamel & Prahalad, 1996). One of the objectives of the theory is to help managers to appreciate why competences can be perceived as a firm’s most valuable asset and, at the same time, to understand how those assets can be used to improve business performance. A resource-based view of the firm accepts that attributes related to past experiences, organizational culture and competences are critical for the success of the firm (Hamel and Prahalad, 1996). The core premise of the resource-based view is that organizational resources and capabilities can vary significantly across firms, and that these differences can be stable (Barney, 1986). The above theory instigated the third research question; How does project procurement procedures affect completion of government funded urban construction projects in Kenya?

**Theory of Constraints**
Goldratt Eliyah (1984) started the Theory of Constraints (TOC), and based this management theory that every system has at least one constraint limiting it from getting more of what it strives for. If this were not true, then the system would produce infinite output. These constraints determine the output of a system whether they are acknowledged or not. Therefore, it is in a manager’s best interest to identify and reduce the system constraints within the organization. The TOC is both descriptive and prescriptive in nature; it not only describes the cause of system constraints, but also provides guidance on how to resolve them. This theory refers to systems in organizations as chains. The above theory instigated the fourth research question: To what extent does project contractor’s experience affect completion of government funded urban construction projects in Kenya?
Conceptual Framework

In the study, the conceptual framework will look at the determinants influencing completion of government funded urban construction projects in Kenya. The conceptual framework for the study is shown in figure 1:

![Conceptual Framework Diagram]

**Independent Variables**
- Project Cost
  - Investment cost
  - Material cost
  - Equipment cost
  - Labour cost
- Project Design Specifications
  - Design information
  - Use of computer aided designs
  - Revision of designs
  - Timely issuance of designs
  - Quality assurance
- Project Procurement Procedures
  - Bidding documents
  - Procurement drawings
  - Approval of procurement stages
  - Tendering systems
  - Procurement standardization
- Project Contractors' Experience
  - Knowledge & cognitive skills
  - Technical skills
  - Management skills
  - Training

**Dependent Variable**
- Project Completion In Government Funded Urban Construction Projects
  - Finish in time
  - Within Budget
  - As per specifications
  - Sustainable

Figure 1: Conceptual Framework
RESEARCH METHODOLOGY
The study was descriptive in nature as it is deemed appropriate because it involved use of written questionnaires administered to respondents. Yin (2003) recommends descriptive design as it allows the researcher to describe, record, analyze and report conditions that exit or existed. Since this study sought to establish the determinants influencing project completion in government funded urban construction projects in Kenya, descriptive research design was the best design.

The target population comprised of the personnel implementing the government funded urban construction projects in Nairobi area.

According to the records available in Nairobi county Council (2014), the major construction projects in the last 10 years implemented in Nairobi area can be divided into roads, housing and water projects.

To get in depth analysis for the study, the research used the project team who comprised of client of the project, work contractor, design consultant and project manager for each project as unit of analysis. Since the unit of analysis in each project is 4, the total study population was 17 x 4 = 68. The major construction projects in the last 10 years in the categories were as follows:

Sample and Sampling Technique
The sample of the study was 17 x 4 = 68. According to NCC (2014), there are 17 projects that are being implemented. In every project, there will be 4 members of project team that is client of the project, work contractor, design consultant and project manager. The sample size is manageable and small enough for data collection, therefore study will adopt census sampling technique. It is also supported by Neuman (2006) who argue that taking a census of the population is applicable if it provides enough information and sufficient for the study. Census sampling technique is procedure of gathering information about the entire population if it is small and reasonable and manageable (Babbie, 2009).

Data collection Method
The study will collect both primary and secondary data during the study. Primary data will be collected using questionnaires to be given to the project teams (clients, contactors, project managers and design consultants).These respondents will be specifically targeted for their ability to provide pertinent information to the study. The questionnaire will contain both structured and unstructured questions. This is because of their simplicity in the administration and scoring of items as well as data analysis (Babbie, 2009). From the data collected, out of the 68 questionnaires administered, 41 questionnaires were fully completed and returned making a response percent of 60.29%. Secondary data was be gathered from existing credible and recognized source. The secondary data will comprise of materials that are desirable, current, accurate, sufficient and relevant and will be collected from library text books, internet and magazines and personnel file in the projects.

Pilot Study
A pilot study was undertaken on at least 7 respondents to test the reliability and validity of the questionnaire. Reliability is the extents to which a research instrument yields findings that are consistent each time it is administered to same subjects (Mugenda and Mugenda, 2003).The measurement of reliability provides consistency in the measurement variables(Kumar,2000)). Internal consistency reliability is the most commonly used psychometric measure assessing survey instruments and scales (Zhang, 2000 The Cronbach’s alpha results ranged between 0. 709 and 0.778 and therefore the construct were acceptable.

Data Analysis and Presentation
Quantitative data will be analyzed by employing descriptive statistics and inferential analysis using statistical package for social science (SPSS) version 22. This technique gives simple summaries about the sample data and present quantitative descriptions in a manageable form, (Orodho, 2003). Together with simple graphics analysis, descriptive statistics form the basis of virtually every quantitative analysis to data, (Kothari, 2005).

The researcher further adopted multiple regression model at 5% level of significance to establish the strength and direction of the relationship between the independent variables (project cost, project design specifications, project procurement procedures and project contractors’ experience) and the dependent variable (Completion of government funded urban construction projects). The project completion of government funded urban construction projects was regressed against four variables.
namely project cost, project design specifications, project procurement procedures and project contractors’ experience. The equation was expressed as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon,$$

Where:

- $Y$ = Completion of government funded urban construction projects, $\beta_0$ = constant (coefficient of intercept),
- $X_1$ = Project cost; $X_2$ = Project design specifications; $X_3$ = Project procurement procedures;
- $X_4$ = Project contractors’ experience; $\varepsilon$ = error term; $\beta_1 \ldots \beta_4$ = regression coefficient of four variables.

The findings were also presented using tables, charts and graphs for further analysis and to facilitate comparison. This generated quantitative reports through tabulations, percentages, and measure of central tendency. Descriptive statistics such as measures of central tendency and dispersion along with percentages were used to organize and summarize numerical data whose results are presented in tables, pie charts, column and bar graphs for easy interpretation of the findings.

**FINDINGS AND DISCUSSIONS**

Table 1: Pearson Correlations on determinants of project completion in government funded urban construction projects in Kenya

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Project contractors experience</th>
<th>Project specifications</th>
<th>design</th>
<th>Project procurement procedure</th>
<th>Project cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project contractors experience</td>
<td>1</td>
<td>.722**</td>
<td>.333**</td>
<td>.453**</td>
<td></td>
</tr>
<tr>
<td>Project design specifications</td>
<td>-</td>
<td>1</td>
<td>.676**</td>
<td>.564**</td>
<td></td>
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<td>Project procurement procedure</td>
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<td>-</td>
<td>1</td>
<td>.654**</td>
<td></td>
</tr>
<tr>
<td>Project cost</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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

**Project Contractors Experience**

**Project Contractors Experience Measure On Project Success**

The research sought out to establish whether the project contractors experience influence project success of the government funded urban construction projects in Kenya. The findings as indicated in Figure 2, a simple majority (58.54%) of the respondents agreed that project contractors experience influence project completion in government funded urban construction projects whereas 41.46% posited that were of contrary opinion. This implies that project contractors experience is an important factor which influence project completion in government funded urban construction project. The findings of the study are in agreement with literature review by Manchweka (2006) who observed that project contractors experience plays an important role on completion of urban projects in the developing countries. Thus lack of contractors experience affected completion of projects in Nairobi County.

![Figure 2: Project Contractors Experience Measure A Project Success](image)

**Contractors Knowledge and Cognitive Skills On Project Completion**

The study sought out to establish whether the project contractors skills could enhance completion of government funded urban construction projects in the study area. The findings as indicated in Figure...
3, a simple majority (63.41%) of the respondents agreed that project contractors experience influence project completion in government funded urban construction projects whereas 36.58% posited that were of contrary opinion. This reveals that project contractor’s skill is an important factor which influence project completion in government funded urban construction project in Nairobi county. Lack of contractors knowledge and cognitive skills in many projects established within the county hinder the decision making and it is of crucial importance that the project organization and project management are meticulously set up and operated in ways that minimize the risk of cost estimates. The findings of the study are in line with Flyvbjerg et al. (2008) who observed that many projects fail to be completed in time due lack of enough skills from the contractors. Thus lack of contractors’ skills prolonged completion of urban construction projects in Nairobi County.

Figure 3: Contractors Knowledge and Cognitive Skills On Project Completion

Contractors Technical Skills On Project Completion

The study sought out to find out whether the project contractor’s technical skills influence project completion of the government funded urban construction projects in Kenya. The findings as indicated in Figure 3 a simple majority (73.17%) of the respondents agreed that project contractors technical skills influence project completion in government funded urban construction projects whereas 26.83% of the respondents were of contrary opinion. It can be deduced that project contractor’s technical skills enhance project completion in government funded urban construction projects in the study area. The contractors responsible for the projects do not have adequate technical skills thus affecting project completion. The findings of the study corroborates with literature review by Chan & Kumararswamy (2007) who observed that many government funded projects fail to be completed in time and within budget as a result of lack of adequate technical skills in the creation of long implementation phases.

Figure 4: Contractors Technical Skills On Project Completion

Continuous Training On Projection Completion

The study sought out to establish whether the project contractors received continuous training as they implemented various project in the study area. The study results as indicated in Figure 5, majority (78.08%) of the respondents disagreed that they were receiving continuous training as they
implemented the projects whereas 21.92% of the respondents were of contrary opinion. It can be deduced from the study findings that project contractors did not receive continuous training thus it hindered project completion of government funded projects in the study area. Continuous training especially on project management and new technology was not available hindering effective completion of government funded urban construction projects. The findings of the study are in agreement with the findings of Karimi (2008) who observed that continuous training especially on adequate planning at the early stages of a project is crucial for minimizing delays and cost overruns. Variations in designs and contract documents usually lead to a change in contract price or contract schedule thus affecting project completion.

Figure 5: Contractors Technical Skills On Project Completion
Cost Escalations On Project Completion

The research sought out to establish whether due to lack of the project contractor’s experience led to project cost escalations therefore hindering project completion of government funded urban constructions projects in the study area. The findings as indicated in Figure 6, a simple majority (53.66%) of the respondents agreed that lack of the project contractor’s experience led to project cost escalations therefore hindering project completion of government funded urban constructions projects in the study area whereas 46.34% of the respondents were of contrary opinion. This implies that project contractors experience on project costing influenced completion of government funded projects in the study area. Cost escalations resulted from inadequate experience in many of the government funded projects. He findings of the study are in tandem with literature review by Muller & Jugdev (2012) who states that cost escalations are common in projects when contractors do not enough experience in the construction process.

Figure 6: Project Design Specifications
Project Design On Project Completion

The research sought out to establish whether project design influenced project completion of government funded urban constructions projects in the study area. The findings as indicated in Table 2, majority (78.05%) of the respondents agreed Project design influenced project completion of government funded urban constructions projects in the study area whereas 21.95% of the respondents were of contrary opinion. This implies that project design has an effect on the completion of government funded projects in the study area. Project designs adversely impact on project completion
of the established projects in the study. The findings of the study are in agreement with literature review by Aiyetan et al (2008) who observed that project completion is dependent on the performance of the design team. The designers are the key players in the construction industry whose services are needed from the conception stage of the project to its completion. The performance of the designers is therefore important because any decision made at the inception of the project will affect project completion.

**Table 2: Project Design on Project Completion**

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>32</td>
<td>78.05</td>
</tr>
<tr>
<td>No</td>
<td>9</td>
<td>21.95</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
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</table>

**Use Of Computer Aided Sign On Project Completion**

The research sought out to establish whether use of computer aided sign influenced project completion of government funded urban constructions projects in the study area. The findings as indicated in Table 3, a simple majority (73.17%) of the respondents agreed use of computer aided sign influenced project completion of government funded urban constructions projects in the study area whereas 26.83% of the respondents were of contrary opinion. This can be deduced that use of computer aided sign influenced project completion of government funded urban constructions projects in the study area. Lack of technology especially on the usage of computer aided design adversely impact on project completion of the established projects in the study. The findings of the study are in agreement with literature review by Aiyetan et al (2008) who observed that project completion is dependent on the usage of computer aided design to a great extent. The designers are the key players in the construction industry whose services are needed from the conception stage of the project to its completion.

**Table 3: Use of computer aided sign on project completion**

<table>
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<tr>
<th>Opinion</th>
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<tr>
<td>Used</td>
<td>30</td>
<td>73.17</td>
</tr>
<tr>
<td>Not used</td>
<td>11</td>
<td>26.83</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
</tbody>
</table>

**Revision Of Designs On Project Completion**

The research sought out to establish whether there revision of designs influenced completion of ongoing projects in the study area. The study results as indicated in Figure 7, a simple majority (53.66%) of the respondents agreed there was a common tendency of revising designs of the ongoing projects and affected their completion whereas 46.34% of the respondents were of contrary opinion. This can be deduced that revision of the designs of the ongoing projects was common thus hindering completion of government funded urban constructions projects in the study area. The study results are in agreement with literature review by Karimi (2008) who states that adequate planning at the early stages of a project is crucial for minimizing delays and cost overruns. Variations in designs and contract documents usually lead to a change in contract price or contract schedule. Typically, change orders and variations present problems to all parties involved in the construction process. Usually, these design changes require additional time and cost inputs which ultimately overruns hindering project completion.
Timely issuance of designs on project completion

The research sought out to establish whether timely issuance of designs influenced completion of government construction projects in the study area. The findings as indicated in Figure 7, a majority (66.66%) of the respondents stated that there was delay of issuance of project designs thus affecting their completion whereas 33.34% of the respondents were of contrary opinion. This implies that project designs were delayed during the commencement of the projects thus affecting their completion in the study area. There is a common tendency in many projects established to have a delay on issuance of the project designs leading to untimely project completion. The study results are in tandem with findings of Muller & Jugdev (2012) who observed that untimely issuance of designs that are imposed when construction is underway, usually lead to reworks, overruns and delays in project completion. Rework and demolition are potential effects of changes in construction, depending on the timing of the occurrence of the changes can ultimately lead to overruns.

Figure 7: Timely Issuance Of Designs On Project Completion

Availability of expertise on project completion

The research sought out to establish availability of project designers’ influenced completion of the projects in the study area. The findings as indicated in Figure 8, a simple majority (56%) of the respondents stated that there was a shortage of project designers and affected completion of the projects in the study area whereas 44% of the respondents were of contrary opinion. This implies that lack of availability of project designers was an impediment on completion of the projects in the study area. The study findings conforms with literature review by Aridity et al (2002) who observed that availability of expertise on project design specifications is a major problem in developing countries. Some are not only hard to predict but also difficult to manage. The inherent contractors’ expertise during preparation, planning, authorization and evaluation procedures for large infrastructure projects creates obstacles to the implementation of such projects (CEU, 2008).
Design Changes On Project Completion
The research sought out to establish whether there was changes on design in the course of implementation of the projects and if it affected completion of the projects. According to the study results as illustrated in Table 4, a simple majority (70.73%) of the respondents stated that there a common occurrence of changes being made on the agreed designs in the course of implementation of the projects and it affected completion of the projects in the study area whereas 29.27% of the respondents were of contrary opinion. This implies that design changes was an impediment on completion of the projects in the study area. The study results are in agreement with literature review by Karimi (2008) who states that adequate planning at the early stages of a project is crucial for minimizing delays and cost overruns. Variations in designs and contract documents usually lead to a change in contract price or contract schedule. Typically, change orders and variations present problems to all parties involved in the construction process. Usually, these design changes require additional time and cost an input which ultimately overruns hindering project completion.

Table 4: Design Changes On Project Completion

<table>
<thead>
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<th>Opinion</th>
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<td>Total</td>
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Project Procurement Procedures

Project Procurement Procedures On Project Completion
The research sought out to establish whether project procurement procedures influenced project completion of government funded urban constructions projects in the study area. The findings as indicated in Figure 9, a simple majority (80.49%) of the respondents agreed project procurement procedures influenced project completion of government funded urban constructions projects in the study area whereas 19.51% of the respondents were of contrary opinion. This implies that project procurements procedures has influence on the completion of government funded projects in the study area. The bureaucracies in the procurement process leads to delay of projects implementation in the study area. The findings are in line with findings of to Kagiri &Wainaina (2007) who observed that procurement procedures for many projects delay completion of projects.

Figure 9: Project Procurement Procedures On Project Completion

Procurement Guidelines and Standardization On Project Completion
The research sought out to establish whether procurement guidelines and standardization influenced project completion of government funded urban constructions projects in the study area. The findings as indicated in Figure 10, a simple majority (73.17%) of the respondents agreed procurement...
guidelines and standardization affected project completion of government funded urban constructions projects in the study area whereas 26.83% of the respondents were of contrary opinion. This can be deduced that procurement guidelines and standardization play an important role on completion of government funded urban constructions projects in the study area. The findings of the study conforms with Kagiri & Wainaina (2007) who states that financiers require the recipient to follow specific rules (i.e., procurement guidelines) for identifying the contractor who constructs the road and to set up specific financial management systems to oversee the use of funds. These specific rules and guidelines are meant to ensure that resources are used efficiently and economically, but at the same time can lead to fragmentation and complexity.

![Figure 10: Procurement Guidelines and Standardization On Project Completion](image)

**Procurement Delays On Project Completion**

The research sought out to establish whether procurement delays affected completion of ongoing projects in the study area. The findings as indicated in Table 5, simple majority (53.66%) of the respondents agreed there were common procurement delays and it affected project completion whereas 46.34% of the respondents were of contrary opinion. This implies that projects were not completed as expected due recurring procurement delays. The study findings are in agreement with literature review by Rundquist (2008) who states that procurement as the acquisition of goods, services and/or infrastructure at the best possible total cost of ownership in the right quantity and quality, at the right time, in the right place for the direct benefit or use of governments, corporations or individuals, generally via a contract greatly influence project completion. It is evident from the discussions above that procurement is an important aspect of the project implementation and has many parties involved namely development partners, government, implementing agencies and contractors. Procurement delays can therefore arise on the projects from various parties involved. The contractors are responsible for the procurement of materials and equipment in all the contracts. For multi-contract projects, where the engineer had dual role of designer and supervisor on the civil contracts, many factors interplay leading to delays. On some contracts, there are delays by contractors in releasing of procurement drawings, delays in provision of design information from supply contractors to the engineer’s designers to prepare procurement drawings. Delays are also experienced in the tendering system, preparation of the bidding documents, and approval by the development partners on the documentation submitted as it has to meet the set standards. The several approval stages in procurement can also lead to delays especially in high-value contracts as they have to go the highest levels for approval.

**Table 5: Procurement Delays on Project Completion**

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>22</td>
<td>53.66</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>46.34</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
</tbody>
</table>

**Tendering Systems On Project Completion**

The research sought out to establish effectiveness of tendering systems affected completion of the projects in the study area. The findings as indicated in Table 5, majority (82.93%) of the respondents stated that there was ineffectiveness of tendering systems thus affecting project completion whereas
17.07% of the respondents were of contrary opinion. This implies that ineffectiveness of tendering systems is an impediment on completion of the projects. It is evident from the discussions above that tendering systems are important aspect of the project implementation and has many parties involved namely development partners, government, implementing agencies and contractors thus affecting project completion in the study area. The study conforms with findings of Rundquist (2008) who observed that the tendering systems delays are also experienced in the preparation of the bidding documents, approval by the development partners on the documentation submitted as it has to meet the set standards. The several approval stages in procurement can also lead to delays especially in high-value contracts as they have to go the highest levels for approval thus affecting project completion.

Table 6: Tendering Systems On Project Completion

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>7</td>
<td>17.07</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>82.93</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
</tbody>
</table>

**Procurement Stages On Project Completion**

The research sought out to whether procurement stages influenced completion of the projects in the study area. The findings as indicated in Figure 11, majority (87.81%) of the respondents stated that there was bureaucracy on every procurement stage and affected completion of the projects in time whereas 12.19% of the respondents were of contrary opinion. This reveals that bureaucracy on procurement stages had effects on completion of the projects in the study area. The study findings are in agreement with literature review by Rundquist (2008) who states that procurement stages as the acquisition of goods, services and/or infrastructure at the best possible total cost of ownership in the right quantity and quality, at the right time, in the right place for the direct benefit or use of governments, corporations or individuals, generally via a contract greatly influence project completion.

![Figure 11: Procurement Stages On Project Completion](image)

**Procurement Policy On Project Completion**

The research sought out to establish whether procurement policy influenced completion of the projects. According to the study results as illustrated in Figure 12, a simple majority (68.29%) of the respondents stated that procurement policy facilitated completion of government urban construction projects in the study area whereas 31.71% of the respondents were of contrary opinion. This implies that government procurement policy plays an important role towards completion of the projects in the study area. The study findings are in agreement with literature review by Rundquist (2008) who states that procurement policy on the acquisition of goods, services and/or infrastructure at the best possible total cost of ownership in the right quantity and quality, at the right time, in the right place for the direct benefit or use of governments, corporations or individuals, generally via a contract greatly influence project completion. For multi-contract projects, where the engineer had dual role of designer and supervisor on the civil contracts, many factors interplay leading to delays. On some contracts, there are delays by contractors in releasing of procurement drawings, delays in provision of design information from supply contractors to the engineer’s designers to prepare procurement drawings which require a proper procurement policy.
Figure 12: Procurement Policy On Project Completion
Procurement Feedback System and Reporting On Project Completion
The research sought out to establish whether effective procurement system and reporting influenced completion of the projects. According to the study results as illustrated in Figure 4.17, a simple majority (71.29%) of the respondents stated that there were ineffective Procurement feedback system and reporting which hindered completion of government urban construction projects in the study area whereas 28.71% of the respondents were of contrary opinion. This implies that ineffective procurement feedback system and reporting did affect completion of urban government funded projects in the study area. The study findings are in agreement with literature review by Rundquist (2008) who states that procurement feedback systems are necessary for procurement purposes.

Figure 13: Procurement Feedback System and Reporting On Project Completion

Project Cost
Project Cost On Project Completion
The research sought out to establish whether project cost influenced project completion of government funded urban constructions projects in the study area. The findings as indicated in Figure 14, a simple majority (92.68%) of the respondents agreed project cost influenced project completion of government funded urban constructions projects in the study area whereas 7.32% of the respondents were of contrary opinion. This implies that project cost has an effect on the completion of government funded projects in the study area. The study established that many projects had issues with cost estimation. The study findings corroborates with the Kuen, Zailani and Fernando (2009) who stated that cost is one of the primary measures of a project’s success. This is true, especially for public projects in developing countries like Kenya, because public construction projects in these countries are executed with lack of proper cost projections on most government funded projects.
The research sought out to establish whether material cost influenced project completion of government funded urban constructions projects in the study area. The findings as indicated in Table 7, a simple majority (73.17%) of the respondents agreed material cost influenced project completion of government funded urban constructions projects in the study area whereas 26.83% of the respondents were of contrary opinion. This can be deduced that material cost played a major role on project completion of government funded urban constructions projects in the study area.

The study findings are in line with a study made in Turkey by Arditi, et al, (2005), the important sources for cost overruns were found to be inflationary pressures, increases in material prices difficulties in obtaining construction materials, construction delays, deficiencies in material cost estimates prepared by public agencies and unexpected sub soil conditions were the most important sources for cost overruns that affected successful completion of projects.

Table 7: Material Cost On Project Completion

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>30</td>
<td>73.17</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>26.83</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
</tbody>
</table>

The research sought out to establish whether labour cost influenced completion of projects in the study area. The findings as indicated in Figure 15, simple majority (51.21%) of the respondents agreed there was a common tendency of revising designs of the ongoing projects and affected their completion whereas 48.79% of the respondents were of contrary opinion. This can be deduced that labour cost can hinder completion of government funded urban constructions projects in the study area. The study findings are in line with a study made in Turkey by Arditi, et al, (2005), the important sources for cost overruns were found to be inflationary pressures, increases in workmen wages difficulties in obtaining construction expert wages, deficiencies in labour cost estimates prepared by public agencies and unexpected sub soil conditions were the most important sources for cost overruns that affected successful completion of projects.
The research sought out to establish whether equipment cost affect completion of the projects in the study area. The findings as indicated in Table 16, majority (58.54%) of the respondents stated that equipment cost affect completion thus affecting their completion whereas 41.46% of the respondents were of contrary opinion. This implies that equipment costs were delayed during the commencement of the projects thus affecting their completion in the study area. The study findings are in line with a study by Mono, (2013) who observed that the important sources for cost overruns were found to be inflationary pressures, increases in material prices difficulties in obtaining construction materials, construction delays, deficiencies in material and equipment cost estimates prepared by public agencies were the most important sources for cost overruns that affected successful completion of projects.

Table 8: Equipment Cost On Project Completion

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>24</td>
<td>58.54</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>41.46</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
</tbody>
</table>

Project Completion

Project Completion In Time

The research sought out to establish whether the government funded urban constructions projects were completed in the study area. The findings as indicated in Figure 16, a simple majority (92.68%) of the respondents stated completion of government funded urban constructions projects in the study area was not on time whereas 7.32% of the respondents were of contrary opinion. This implies that most of government funded projects in the study area were not completed in time.
respondents were of contrary opinion. This implies that most of government funded projects in the study area were completed as per the specification.

### Table 9: Project Completion In Time

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8</td>
<td>19.51</td>
</tr>
<tr>
<td>No</td>
<td>33</td>
<td>80.49</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>100</td>
</tr>
</tbody>
</table>

#### Project Completion Within The Budget

The research sought out to establish whether the government funded urban constructions projects were completed as per the specified budget in the study area. The findings as indicated in Figure 17, majority (95.12%) of the respondents stated completion of government funded urban constructions projects in the study area were not completed within the specified budget whereas 4.88% of the respondents were of contrary opinion. This implies that most of government funded projects in the study area were not completed within the allocated budget.

![Figure 17: Project Completion Within The Budget](image)

#### Multiple Regression Analysis

According to Green & Salkind (2003) regression analysis is a statistics process of estimating the relationship between variables. Regression analysis helps in generating equation that describes the statistics relationship between one or more predictor variables and the response variable. Since there are four variables against one dependent variable, multiple regression analysis was used to establish their relationship at 5% level of significance. Further, the multiple regression analysis is mathematically expressed as shown below: a multivariate regression model was applied to determine the relative importance of each of the four variables with respect to the project completion of government urban funded projects. The results are shown in Table 9.

### Table 9: Model summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.811(^a)</td>
<td>.642</td>
<td>.618</td>
<td>.876</td>
</tr>
</tbody>
</table>

\(^a\) Predictors: (Constant), project contractors experience, project cost, project design specifications and project procurement procedures

R is the correlation coefficient which shows the relationship between the study variables, from the findings shown in the Table 9 is notable that there exists strong positive relationship between the study variables as shown by 0.811. The coefficient of determination (R\(^2\)) explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (project completion of government urban funded projects) that is explained by all four independent variables (project contractors experience, project cost, project design specifications and project procurement procedures). According to the four independent variables studied, they explain only 64.20% of the project completion of government urban funded projects. This implies that these variables are very significant therefore need to be considered in any effort to enhance project completion of government urban funded projects in Kenya. The study therefore identifies variables as critical determinants of project completion of government urban funded projects.
projects. Further, it means that other factors not studied in this research contribute 35.80% of project completion of government urban funded projects. Therefore, a further study should be conducted to investigate the other factors that contribute 35.80% which influence project completion of government urban funded projects.

Analysis of Variance (ANOVA)

Table 10: Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>86.880</td>
<td>4</td>
<td>21.720</td>
<td>32.2494</td>
<td>.001b</td>
</tr>
<tr>
<td>Residual</td>
<td>24.247</td>
<td>36</td>
<td>.6735</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>109.901</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Project completion of government urban funded projects

b. Predictors: (Constant), project contractors experience, project cost, project design specifications and project procurement procedures

c. Critical value = 17.673

From the Table 10, the study established the regression model had a significance of 0.001 which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. The F-calculated value was greater than the critical value (32.2494 > 17.673) an indication that project contractors experience, project cost, project design specifications and project procurement procedures and all enhance Project completion of government urban funded projects and this shows that the overall model was significant

Regression Coefficients

Table 11: Regression Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>65.008</td>
<td>2.065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project contractors experience</td>
<td>.644</td>
<td>.885</td>
<td>.502</td>
<td>2.455</td>
</tr>
<tr>
<td>Project design specifications</td>
<td>.493</td>
<td>.556</td>
<td>.555</td>
<td>3.266</td>
</tr>
<tr>
<td>Project procurement procedures</td>
<td>.703</td>
<td>.487</td>
<td>.405</td>
<td>2.011</td>
</tr>
<tr>
<td>Project cost</td>
<td>.532</td>
<td>.356</td>
<td>.609</td>
<td>2.069</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Project completion of government urban funded projects

The general form of the equation was to predict project completion of government urban funded projects from project contractors experience, project cost, project design specifications and project procurement procedures is: \[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \] Where \( Y \) = Project completion of government urban funded projects; \( \beta_0 \) = Constant Term; \( \beta_1, \beta_2, \) and \( \beta_3 = \) Beta coefficients; \( X_1 = \) project contractors experience; \( X_2 = \) project design specifications ; \( X_3 = \) project procurement procedures; \( X_4 = \) project cost and \( \epsilon = \) Error term. The model equation would be; \[ Y = 65.008 + 0.644X_1 + 0.493X_2 + 0.703X_3 + 0.532X_4 \]. The Project completion of government urban funded projects is 65.008 + (0.644 x project contractors experience) + (0.493 x project design specifications) + (0.703 x project procurement procedures) + (0.532 x project cost). From above regression equation; the study found out that when all independent variables (project contractors’ experience, project cost, project design specification and project procurement procedures) are kept constant at zero the Project completion of government urban funded projects will be at 65.008. At one unit change in project contractors experience will lead to 0.644 increases in Project completion of government urban funded projects. Also a one unit change in project design specifications will lead to 0.493 increases in the Project completion of government urban funded projects. Further, a one unit change in project procurement procedures will lead to 0.703 increases in the new Project completion of government
urban funded projects and one unit change in project cost will lead to 0.532 increases in Project completion of government urban funded projects.
This concludes that knowledge application contributes more to Project completion of government urban funded projects. To test for the statistical significance of each of the independent variables, it was necessary to test at 5% level of significance and 95% level of confidence of the p-values and from the Table 4.10 the project contractors experience had a 0.013; project procurement procedures showed a 0.011 level of significance, project design specification showed a 0.037 level of significance and project cost had a 0.019 level of significance. Therefore, the most significant factor was project procurement procedures.

CONCLUSIONS
The study established that project cost affects completion of the government funded urban construction projects. The study revealed that inadequate funds on investment materials, equipment and labour adversely affected completion of the projects. Further, the study revealed that the variable statistically, moderately, positively and significantly correlated to project completion of the government funded projects in the county
Additionally, the study found out project designs such as inadequate design information, use of computer aided designs, revision of designs, timely issuance of designs and lack of quality assurance in designs to some extent affect completion of the projects. The study revealed that the variable statistically, strongly and significantly correlated to project completion of the government funded projects in the county
Further, the study revealed that project procurement procedures influenced completion of the urban construction projects. The lack of bidding documents, procurement drawings, approval of procurement stages, tendering systems and procurement standardization affected completion of the projects. The Pearson correlation coefficient statistically, strongly and significantly correlated to project completion of the government funded projects in the county
Finally, project contractors experience in terms of technical skills, management skills due to lack of enough trainings was found out to be a major impediment towards completion of the projects. The Pearson correlation coefficient statistically, strongly and significantly correlated to project completion of the government funded projects in the county

RECOMMENDATIONS
The study recommends that that project contractors experience is crucial for project completion of government funded urban construction projects. There is need to enhance the contractor’s knowledge and a cognitive skill through the contractor’s continuous training. The cost escalations due to contractors experience and bankruptcy of the contractor during implementation period should be established. The contractors experience during preparation, planning, authorization and evaluation procedures influenced completion of the government funded urban projects should also be established to avoid delays of the projects.
The project design specification should be enhanced to improve project completion in government funded urban construction projects. The timing of issuance of designs, availability of expertise on designing, the design efficiencies reduce to redesign and rework or poor quality of products thus improving completion of the government funded urban projects in Nairobi county
The project procurement procedures through the tendering systems, approval of procurement stages, the government procurement policy on implementation of projects and monitoring of the procurement system and reporting should be monitored and evaluated to reduce the project cost especially on the material cost, labour cost, equipment cost, control cost overruns and deficiencies on cost estimates, financial management of project funds and monitoring and evaluation of funds, government capital investment cost on implementation of projects to enhance performance of the projects.

REFERENCES

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