

**INFLUENCE OF e-MONITORING AND EVALUATION ON
PERFORMANCE OF REAL ESTATE PROJECTS IN NAIROBI
COUNTY, KENYA**

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**A Research Project Report Submitted in Partial Fulfilment of the Requirement of the
Award of Degree of Master of arts in Project Planning and Management, University of
Nairobi.**

2019

DECLARATION

This research project is my original work and has not been presented for examination in any other university

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Recommendation

This Research Project Report is being submitted for examination with my approval as the university supervisor.

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DEDICATION

I dedicate this project to my wonderful mother Christine and siblings who encouraged and inspired me to attain my academic potential.

ACKNOWLEDGEMENT

I wish to take this opportunity to thank my supervisor, Prof. Dorothy Kyalo for her advice, guidance, motivation and support during this process. I also wish to thank my lecturers for taking me through the course work successful. I thank my family, colleagues and friends for their support, understanding and encouragement during this entire period.

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LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|----------------|---|
| ANOVA | - Analysis of Variance |
| ICT | -Information Communication Technology |
| IPMA | - International Project Management Association |
| M&E | -Monitoring and Evaluation |
| NACOSTI | -National Council of Science, Technology and Innovation |
| OECD | - Organization for Economic Corporation Development |
| PM | -Project Management |
| PU | - Perceived Usefulness |
| SPSS | -Statistical Package for the Social Sciences |
| TAM | - Technology Acceptance Model |

ABSTRACT

The purpose of the study is to establish influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County, Kenya. The study objectives were to establish how e-Cost tracking, e-quality assurance, integrated communication management system, e-time tracking influence performance of real estate projects in Nairobi County. The study was guided by program theory, Technology Acceptance Model (TAM), the social theory and Critical Chain Project Management Theory. The study adopted descriptive survey method. The target population of the study was 834 personnel of the registered Real estate Firms in Nairobi County as in the year 2017. The sample size was 270 personnel determined using Yamane formula. Data was collected using questionnaires with closed-ended questions. Reliability and validity tests were conducted to ascertain the reliability and validity of the research instrument. After data had been collected through questionnaires, it was prepared in readiness for analysis by editing, handling blank responses, coding, categorizing and keying into statistical package for social sciences (SPSS) computer software for analysis. SPSS software version 21.0 was used to produce frequencies, descriptive and inferential statistics. E-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking explain 60.9% of the variations in the dependent variable which is performance of real estate projects in Nairobi County. Pearson correlation indicated that e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking have a significant association with performance of real estate projects in Nairobi City County. Regression of coefficients showed that project that e-cost tracking and performance of real estate projects in Nairobi County have a positive and significant relationship ($r=.259$, $t=6.652$, $p<0.05$), e-quality assurance and performance of real estate projects have a positive and significant relationship ($r=.272$, $t=6.626$, $p<0.05$), e-time tracking and performance of real estate projects have a positive and significant relationship ($r=.144$, $t=3.918$, $p<0.05$), integrated communication management system and performance of real estate projects have a positive and significant relationship ($r=.175$, $t=5.920$, $p<0.05$). It was concluded that e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking influences performance of real estate projects in Nairobi County. The study recommends for the adoption of e-cost tracking to techniques to monitor cost expenses to the real estate company. Effective cost tracking will minimize cost overruns and project delays that reduce the profitability margin of the real estate company. The study recommends for the adherence to quality standards of real estate projects during development. There is need to employ electronic quality monitoring tools to improve of the quality of real estate projects. An integrated communication management system is required to link various facets of the organization. Integrated communication management in the real estate sector allows simultaneous running of various activities that need to be coordinated well. The study recommends the implementation of e-time tracking systems to check project progress against time. The techniques include Gantt charts, Critical path methodology and Program Review Evaluation technique. The appropriateness of e-time tracking can be seen as a relevant indicator that could be used to assess contractors' effectiveness and capability to succeed on the completion of a project and to evaluate contractors' performance.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The performance of real estate is measured based on project success. A project is acknowledged successful if it is completed within budget and on schedule within a pre specified scope, and if it meets users' expectations, quality requisites, and technical specifications (Amoatey, Ameyaw, Adaku & Famiyeh, 2015). Also, performance of project as an objective measure of project targets including completion of the project on schedule, within budget, in good quality, and with timely completion (Satankar & Jain, A. 2015). Time, cost, and quality are the basis of project performance, but also they are not enough for a fair view of project success. Also there are a number of criteria including completing the project on budget and schedule, quality of workmanship, client and project manager's needs, transfer of technology, environment friendliness, and health and safety (Bredin & Söderlund, 2013).

In addition to defining project success, some other objectives are identifying critical success factors, developing conceptual frameworks, and analyzing the relationships among critical success factors and the link between the critical success factors and performance. Real estate development involves acquiring land to build, determining the marketing of the project, developing the building program and design, obtaining the necessary public approvals and financing, building the structure, then leasing, managing, and ultimately selling it (Ika, 2012).

The real estate development decisions generally consider only the financial aspects of the projects. Feasibility calculations are based on the net present value (NPV) of the investments. Considering the high number of activities involved, measuring real estate project success is not a simple task (Kariungi, 2014). The performance of real estate projects has not been widely investigated except for a small group of studies. Also choosing the right business metrics and monitoring them through effective scorecards identifies and amplifies the competitive value that corporate real estate creates (Atkinson, 1999). The performance of real estate projects could be tied to particular other factors including monitoring and evaluation.

Project e-monitoring and evaluation is the art and science of managing all aspects of the projects by integrating technology in monitoring and evaluation to achieve the project mission objective, within the specified time, budgeted cost, and pre-defined quality specification working efficiently, effectively, and ethically in the changing project environments (Muturi & Gathenya, 2014). Monitoring and evaluation (M&E) assists project managers to performance of a firm. Monitoring and evaluation are the tools that help project managers know when plans are going according to plan and when conditions change. They provide the management with information to make decisions regarding the project (OCDE, 2016). Monitoring and evaluation (M&E) is useful to all projects, big or small, because it helps in identifying project areas that are on target and those that need to be adjusted or replaced.

The success of project performance depends partly on the project management approach used during planning, implementation and commissioning. E-monitoring process integrates technology to ensure the success of the project phase. Information Communication Technology (ICT) tools have been used before in project monitoring phases. These tools are used for communication between the project implementing teams and other project stakeholders. They are also used for information gathering, storing, retrieval, tracking and analysis. All these processes are aimed at enhancing the performance of projects (D'Atri, *et al*, 2011).

Different types of projects require different types of M&E systems (Shapiro 2011). Monitoring is the process of regular and systematic collection, analyzing and reporting information about a project's inputs, activities, outputs, outcomes and impacts. Monitoring is therefore a way of improving efficiency and effectiveness of a project, by providing the management and stakeholders with project progressive development and achievement of its objectives within the allocated funds (World Bank, 2011). It therefore keeps track of the project work and informs the management when things go wrong. Evaluation, on the other hand, is a scientific based appraisal of the strengths and weakness of the project. It is therefore a comparison between the actual and the planned. Evaluation is a means of checking efficiency, effectiveness and impact of a project (Wachamba, 2013).

In project monitoring, the use of information communication technology (ICT) is useful because it helps enhance information collection, storage and dissemination as well communication between the project participants (Walker, 2015). The project manager should ensure that the time allocated for each task has been used and no lagging should be reported. As well, each task should not have a cost overrun. In project monitoring, there is a comparison of the actual versus the planned outcomes during the project implementation. Communication, collecting and sharing of information is one of the ways that can be used to enhance success of monitoring activities in projects (Kasim & Ern, 2010). Information Communication Technology can be an essential tool in monitoring of projects. ICT refers to technology used to handle information and aid communication. It also refers to the amalgamation of computing and telecommunications technologies, including the Internet, which are the matrix within which information and digital media are created, distributed and accessed (D'Atri, Ferrara, George & Spagnoletti, 2011).

E-monitoring and evaluation of projects activities involves technologically tracking, reviewing, and regulating the progress to meet the performance objectives defined in the project management plan. E-monitoring includes status reporting, progress measurement and forecasting. Performance reports provide information on the project's performance with regard to scope, schedule, cost, resources, quality and risk which can be used as inputs to other processes (Heagney, 2016). World Bank (2011) describes monitoring as the process of regular and systematic collection, analyzing and reporting of information about a project's inputs, activities, outputs, outcomes and impacts. It is a way of improving efficiency and effectiveness of a project by providing the management and stakeholders with project progressive development and achievement of its objectives within the allocated resources.

Evaluation is a scientific based appraisal of the strengths and weakness of the project (Hunter, 2009). It is a comparison of the actual results and what was planned or expected. Evaluation is a means of checking efficiency, effectiveness and impact of a project. There are three main types of evaluations: Formative evaluation, which is carried out before the project commences; Process evaluation carried out when the project is ongoing and Summative evaluation which is carried out after the completion of the project (Njama & Kyalo, 2015). Evaluation involves: looking at what the project or program intended to achieve, assessing progress towards what was to be achieved and impact on targets, looking at the effectiveness of the project strategy, efficient use of resources, opportunity costs and

sustainability of the project, and the implications to the various stakeholders (Shapiro, 2011). Evaluation involves systematic and objective assessment of the ongoing or completed projects or program in terms of; design, implementation and results in order to judge issues such as project or program relevance, effectiveness, efficiency, impact and sustainability (World Bank, 2011).

E-monitoring and evaluation helps those involved with projects to assess if progress is being achieved in line with expectations. Monitoring is the on-going collection and analysis of data that informs project managers if progress toward established goals is being achieved (Callistus & Clinton, 2016). Evaluation is a comprehensive appraisal that looks at the long-term impacts of a project and exposes what worked, what did not, and what should be done differently in future projects.

1.2 Statement of the problem

E-monitoring and evaluation has in the recent become a necessary requirement for project success in real estate industry. It is natural that managers in the real estate industry should be concerned about firm performance because of its expected influence on future projects and firm's reputation. E-cost tracking, e-quality assurance, integrated communication management, baseline survey and time tracking require the integration of technology for optimal project output. The success of a project is directly related to firm performance.

The demand of housing in Nairobi is high. According to HASS (2016), the demand of housing in Nairobi has been on the rise. According to the Kenya National Bureau of Statistics (2016), the real estate and construction sector continues to be some of the key drivers of economic growth in Kenya for the last five years. However, the real estate industry has been facing a lot of challenges in quality assurance from collapsing of buildings, lack of capacity to facilitate the implementation of quality control and disregard of ICT in monitoring and evaluation in project management. Despite Ministry of Transport, Infrastructure, Housing and Urban Development pointing out that the majority of professionals are competent to offer good quality advice and service, but some give poor service through poor documentation, poor decision making and extension of time variation (Ministry of Transport, Infrastructure, Housing and Urban Development, 2016). This undermines the performance of real estate in Nairobi County.

The project monitoring phase is critical to the success of the project outputs and outcomes. Tools used in the project monitoring process partly contribute to the success of this phase. The success of the project monitoring phase is linked to the project performance (Adhiambo, 2015). It is thus useful to understand the link between project monitoring and project performance. Such a link can better be understood by focusing on the relationship between the tools used in project monitoring and the project performance. Project monitoring process uses ICT tools to ensure the success of the project phase. M&E is an important activity in projects because it determines project success (Meredith & Mantel, 2011).

ICT tools have been used before in project monitoring phases. These tools are used for communication between the project implementing teams and other project stakeholders (Wagner et al., 2005). They are also used for information gathering, storing, retrieval, tracking and analysis. All these processes are aimed at enhancing the performance of projects (D'Atri, et al, 2011). The relationship between the use of ICT in project management and performance has been an attractive area of study to researchers.

Studies have been carried out with the purpose of establishing the kind of relationship that exists between the use of ICT and the performance of projects. Phiri (2015) conducted a study to assess the influence of Monitoring and Evaluation (M&E) on project performance at African Virtual University (AVU) and the results showed that M&E planning and M&E training influences project performance. Barasa (2014) conducted a study to find out the influence of M&E tools on project performance of building and construction projects in Kenyan public universities: A case of the University of Nairobi and found out baseline survey help in understanding project expectation. Kamau & Mohamed (2015) did a study on efficacy of monitoring and evaluation function in achieving project success in Kenya and found that management support as a mediating factor between M&E and the Project Success. Sialala (2016) also did a study on the influence of Monitoring and Evaluation Integration on Completion of Road Projects: A Case of Kajiado County and found that there was a relationship between integrating Monitoring and Evaluation and on performance of Roads Projects in Kenya.

It is clear that none of the research has attempted to integrate technology in monitoring and evaluation. It is also evident from the studies that none focused the performance of real estate projects. Majority of the studies focused on project performance in general and did not specifically focus on real estate projects. These are the knowledge gaps that the current study sought to fill by establishing the influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County, Kenya.

1.3 Purpose of the Study

The purpose of this study was to establish influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County, Kenya.

1.4 Objectives

- i. To establish how e-Cost tracking influences performance of real estate projects in Nairobi County.
- ii. To determine how e-Quality assurance influences performance of real estate projects in Nairobi County.
- iii. To establish how Integrated Communication Management Systems, influence performance of real estate projects in Nairobi County.
- iv. To examine the influence of e-Time tracking on performance of real estate projects in Nairobi County.

1.5 Research questions

The study was guided by the following research questions:

- i. How does e-Cost tracking influence performance of real estate projects in Nairobi County?
- ii. How does e-Quality assurance influence performance of real estate projects in Nairobi County?
- iii. How does Integrated Communication Management System influence performance of real estate projects in Nairobi County?
- iv. How does e-Time tracking influence performance of real estate projects in Nairobi County?

1.6 Significant of the Study

Real estate industry contains large number of parties as clients, contractors, consultants, stakeholders, shareholders, regulators and others. Most of real estate firms in Nairobi County suffer from many problems that are mostly related to performance. The study may be important in highlighting the challenges undermining the provision of quality services to the clients. The practices concerned with the key performances indicators such as time, cost, quality and time management may inform the choice of real estate construction firms for clients and policy makers. These key performances indicators may be used to measure performance in real estate projects and can then be used for benchmarking purposes. The study may form a basis for future scholars conducting research monitoring and evaluation in real estate firms.

1.7 Limitation of the Study

In undertaking this study, the researcher encountered several challenges as follows: Fear of victimization was a key limitation to this research work. There were also concerns of confidentiality of respondents that may affect their honesty in providing information. Based on these limitations, the researcher mitigated these challenges by informing the respondents that this is an academic research work and confidentiality of all respondents and information provided were guaranteed as it was one of the ethical issues in research. As a result, no respondent was victimized based on their contributions in informing this study. The researcher did not indicate the names nor request for identification numbers in any of the research instruments and therefore no chances of linking any information to particular respondents. This may influence respondents in providing true, factual and adequate information.

1.8 Delimitations of the study

This study was delimited to the Real Estate Firms in Nairobi County. There are 139 real estate firms in Nairobi County as for December 2017. Stratified random sampling technique was used to get the sample for the study.

1.9 Assumptions

The study was conducted with the assumption that the respondents are objective and that they provided correct answers. The second assumption is that the respondent's views were critical with regard to the focus of the study which is e-monitoring evaluation and performance. This study also assumed that respondents have a good understanding on the influence of e-monitoring and evaluation on performance of real estate projects. It was also assumed that the respondents provided honest responses. Technology Acceptance Model (TAM) is a model explaining adoption of new technology. The basis and applicability of the model is subject to criticism and shortcomings.

1.10 Definition of significant terms used in the study

The study defined various significant terms used in the study as cited by various scholars and the researcher.

e-Cost tracking: assessing how well the project adheres to the planned budget so as to avoid or reduce cost overruns. This is done by auditing the expenditures and costs incurred at every phase of the project on capital, service provision and labour.

e-Quality assurance: Systematic process of checking to see whether products or services offered by the real estate firms meet specified requirements. A quality assurance system is said to increase customer confidence and a company's credibility, to improve work processes and efficiency, and to enable a company to better compete with others.

e-Time tracking tools: Computer software that allows real estate firms to record time spent.

Evaluation: is an assessment, as systematic and objective as possible, of an ongoing or completed project, program or policy, its design, implementation and results.

Integrated Communication: Refers to a communications management project plan that can organize and document the process, types, and expectations of communications and provide the stakeholder communications requirements to communicate the appropriate information as demanded by the stakeholders.

Performance: is defined as the total quality of a project in terms of whether it has impacted the beneficiaries and whether the interventions are sustainable.

1.11 Organizational of the Study

The study is organized in five chapters. Chapter one presents the introduction, background of the study, statement of the problem, purpose of the study, research objectives and research questions, significance of the study and definition of significant terms. Chapter two presents the literature review, theories and conceptual framework and ethical issues. Chapter three presents research design, target population, sample size, sampling procedure, data collection, validity of instruments and reliability of the research instrument, methods of data analysis techniques while chapter four presents the findings, presentation of the results and interpretation of the findings in statistical methods. Finally, Chapter five presents the summary of findings, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews relevant literature to establish the influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County. The chapter presents the theoretical review linking each variable to theories and objectives of this study. The literature review is undertaken to reveal the conceptual framework and empirical review in respect of each variable. A critical review is also discussed to collate important aspects of literature on the variables.

2.2 Empirical Review

Project performance is defined as the total quality of a project in terms of whether it has impacted the beneficiaries and whether the interventions are sustainable (Chandes & Pache, 2010). Performance assesses the ability of the project benefits to continue when the project closes (Chandes et al., 2010). Project performance can be evaluated with regard to whether it adds value, or it makes the organization more effective (Onukwube, Iyabga & Fajana, 2010). The project performance indicators will be cost, time, quality and scope. Brière, et al., (2015) identified project performance categories such as people, cost, time, quality, safety and health, environment and rate of completion. Bredin and Söderlund (2013) suggests that project performance is when the organizational goals and objectives are achieved, within time, within cost while utilizing the assigned resources effectively and efficiently.

However, like the operations of other sectors, the performance of real estate business can be achieved through evaluation against suitable criteria, monitoring and evaluation or benchmarking against set standards or previous performance of similar projects (UNDP, 2012). Key criteria against which the project performance can be evaluated against includes; whether it is relevant, efficient, effective, whether it has impacted the beneficiaries and whether the interventions are sustainable (Hill, 2005). Relevance relates to whether the project activities are in line with the priorities of the target group, recipient and donor or sponsor. Key questions that are asked in assessing relevance are whether the goals of the project respond to the needs of the recipients and whether the activities and outputs of the project

are in line with those goals (Satankar & Jain, 2015). Effectiveness measures whether a certain project is able to realize its goals. Impact examines positive and negative changes as a result of the project. Efficiency assesses inputs against outputs to find out whether the project uses optimum resources possible to achieve the desired results (Larson & Gray, 2013).

Lekamparish (2017) did a study to determine influence of monitoring and evaluation on project performance in State Corporation in Kenya focusing on Mombasa- Nairobi Pipeline construction project. The study adopted descriptive research design. From the findings, it was revealed that due to monitoring and evaluation feedback there is enhanced accountability minimizing project financial mismanagement, enhanced project decision making and the project experience transparency. Regression results revealed that monitoring and evaluation feedback, training and development in monitoring and evaluation, monitoring and evaluation communication and resource allocation on monitoring and evaluation has significance and positive influence on project performance.

Wachamba (2013) did a study by looking at the determinants influencing the effectiveness of M&E systems in NGO's within Nairobi County, Kenya. The researcher used descriptive research design. The findings indicated that there are difficulties in the application of the M&E systems, which was mainly attributed to the tools and techniques used. This is due to the difficulty in their applicability. The role of management in the operations of the M&E system, although termed as adequate and prompt, also affects the effectiveness of the M&E system. A good number of the respondents had attended training in the M&E systems and termed it as comprehensive and relevant since it contributed to the effectiveness of the M&E system as well as to the competence of the staff. The M&E training was also found to be an important contributor towards induction of local M&E experts in addition to increasing the quality and quantity of the M&E human resource. The technical expertise of the team even though termed as one of the least factors contributing to difficulties in using M&E systems, it determines the echelon of success of the M&E system.

Kamau and Mohamed (2015) conducted a study on the efficacy of monitoring and evaluation function in achieving project success in Kenya. The researcher used literature review approach to analyze the factors related to M&E influencing project success. All the factors identified were grouped into four main categories which are: Strength of M&E team, monitoring approach adopted, political influence

and project lifecycle stage. The study further identified management support as a mediating factor between M&E and the Project Success. A good M&E without management support is likely not to succeed.

Callistus and Clinton (2016) did a study on evaluating barriers to effective implementation of project monitoring and evaluation in the Ghanaian construction industry. The collected data were analysed using the one sample t-test. Literature revealed ten (10) challenging factors to the implementation of monitoring and evaluation. Weak institutional capacity, limited resources and budgetary allocations for monitoring & evaluation, weak linkage between planning, budgeting and monitoring & evaluation, weak demand for and utilisation of monitoring and evaluation results and finally, poor data quality, data gaps and inconsistencies were identified as the most significant contributing factors to the implementation of PM&E in Ghana construction projects. The study contributes to the body of knowledge on the challenges to effective monitoring and evaluation of construction projects.

Gichaiya (2016) conducted a study on the effects of monitoring and evaluation tools on implementation of wireless network projects in institutions of higher learning in Kenya. The results revealed that monitoring and evaluation contributed to working within the expected timeframe in order to achieve positive results. In general, from the findings, the institutions can gain full benefit of the project when monitoring and evaluation facet is emphasized. Monitoring and evaluation were positively significant in the implementation of wireless network projects.

Thairu (2014) did a study to analysis of implementation of NGO projects in Nairobi County. The study was a descriptive survey research. From the findings, communication with regard to the application of project management tools and availability of information for decision-making affects project implementation. The researcher also found out that communication is the most critical element for the success; it found that communication and financing have relatively more weight and importance to project implementation than monitoring and planning.

Wachaiyu (2016) conducted a study to determine the monitoring and evaluation factors influencing success of development projects in Starehe Sub-county, Kenya. This study employed a descriptive survey research design. The study revealed that strength of monitoring

team, budgetary allocation, M&E plan and selection of tools and techniques played an important role in determining the success of development projects. M & E is important for success of any project, yet in most development projects it has not been adopted effectively. The role of strength of monitoring team, budgetary allocation, M&E plan and selection of tools leaves only 24.8 percent unexplained.

Kimweli (2013) conducted a study to find out the role of monitoring and evaluation practices to the success of donor funded food security intervention projects. The study utilized a case study design. The study established that the community was not involved in any monitoring and evaluation of the food security intervention projects. Participatory monitoring and evaluation in food security projects therefore contributes to the success of food security projects though it should be complemented with good project management skills. For P M & E to be applied to the projects, the projects implementing agencies should conduct trainings to the community to build up their capacity in understanding and participation in the monitoring and evaluation system.

Sialala (2016) conducted a study to investigate the extent to which Influence of Monitoring and Evaluation Integration on Completion of Road Projects: A Case of Kajiado County. The study adopted a descriptive research design. Based on the results there was a relationship between integrating Monitoring and Evaluation and on performance of Roads Projects in Kenya: A Case of Kajiado County from the data coefficient of determination (R^2 of 72) was obtained meaning there is a strong relationship between integrating Monitoring and Evaluation and on performance of Roads Projects in Kenya.

Phiri (2015) did a study to assess the influence of Monitoring and Evaluation (M&E) on project performance at African Virtual University (AVU). The research design for this study was a mix of ex-post facto research design and survey. Results show that monitoring and evaluation as a management function, indeed has influence on project performance. This is demonstrated in activities like M&E planning in which prior to project implementation, appropriate performance indicators are identified, and a data collection schedule is devised.

Satankar and Jain (2015) conducted a study on success factors for real estate construction projects. The first step was to construct a conceptual model based on a comprehensive literature review on real estate project success. This research also found that the critical success factors in construction projects have different priorities and weights. Also, considering the importance, the critical success factors are respectively: Technical and economic assessment of the required project resources, experience and executive records of the project manager, project strategic planning, time cost and quality management, completion, environmental safety, user affordability and design consideration, cost of individual units and technology.

Auma (2014) conducted a study to investigate the factors affecting the performance of construction projects in Kenya. The result shows that the majority of projects executed had a higher percentage of cost overrun, were delayed in time and client were sometimes satisfied with the project. Higher percentage of respondents agreed that the cost of equipment and materials, cost of variation orders, cost of rework and escalation of material prices are the cost factors that affect the performance of construction project. Percentage of orders delivered late, delay in claim approval and delay of payment from client to contractor are time factors that affect the performance of construction project. Qualification and experience of staffs, quality of equipment and materials, conformance to specification are quality factors while leadership factors are staff training and leader's professional qualification are factors that affect the performance of construction projects. From these findings, performance of construction project is influenced by the cost of materials, time management, quality management and the leadership style adopted on site.

Waithera and Wanyoike (2015) conducted a study to determine factors that influence the project monitoring and evaluation performance of youth funded agribusiness projects in Bahati Sub-County, Kenya. Descriptive survey research design was used. Findings showed that only the training of staff had a statistically significant influence on project monitoring and evaluation performance of youth funded agribusiness projects. The study concluded that youth fund managers should consider offering short, formal monitoring and evaluation training courses to all youth groups that apply for the funds.

2.3 E-cost tracking and performance

E-cost monitoring seeks to assess how well the project adheres to the planned budget so as to avoid or reduce cost overruns. This is done by auditing the expenditures and costs incurred at every phase of the project on capital, service provision and labour (Callistus & Clinton, 2016). Planning and performance monitoring in government have been predominantly characterized by a silo approach. This has resulted in a situation where planning, budgeting, and reporting and monitoring and evaluation functions are done by different sections in institutions in isolation of each other. As a result, plans are not always aligned and synchronized with the cost of the project. Other challenges include the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information (Ole 2015).

The e-costing tracking should provide a clear and adequate provision for monitoring and evaluation events. Project success can be delineated within the overall project costing to give the monitoring and evaluation function the due recognition it plays in project running (Njama & Kyalo, 2015). Monitoring and evaluation costing should be about 5 to 10 percent of the entire budget (OCDE, 2016).

2.4 e-Time tracking and performance

Time dimension of assessing project success is the most common aspect in project monitoring and evaluation. Pretorius et' al (2012) found out that project management organizations with mature time management practices produce more successful projects than project management organizations with less mature time management practices. Project time is the absolute time that is calculated as the number of days/weeks from start on site to practical completion of the project. Speed of project implementation is the relative time (Chan, 2001). Peterson & Fisher (2009) established that construction firms are usually interested in monitoring project time variance and verifying contractor progress payments requests.

Monitoring gives information on where a policy, program, or project is at any given time (and over time) relative to respective targets and outcomes. Evaluation gives evidence of why targets and outcomes are or are not being achieved. It seeks to address issues of

causality. Kariungi, (2014) expressed that energy sector projects were completed on time due to factors such as efficient procurement procedures, favorable climatic factors, timely availability of funds and proper utilization of project planning tools. Project completion within scope is considered as one of the success factors. The project charter or statement of work requires the implementers to develop a scope of work that was achievable in a specified period and that contained achievable objectives and milestones, (Bredillet, 2009).

However, monitoring project time is one of the many challenges for the project manager. Time monitoring seeks to assess how well the project adheres to the planned schedule over a period of time. There are a variety of ways in which a construction schedule can be presented. The more common types of construction schedule include: Gantt chart, activity on the arrow, precedence network and line of balance. Bar charts or Gantt charts are a powerful communication tool and an extremely useful, visual and graphical medium in construction scheduling Callistus & Clinton, 2016). Real estate projects should be monitored and evaluated as planned and scheduled frequently. This allows for sufficient and informed decision-making processes. This also reduces wastage of resources and time since corrective measures can be applied to where there are hitches in project implementation. Project firms with mature time management practices produce successful projects than those with less mature time management practices (Kariungi, 2014).

2.5 Integrated Communication Management System and performance

Communication is the process of sharing information, thoughts and feelings between people through speaking, writing or body language. Effective communication extends the concept to require that transmitted content is received and understood by someone in the way it was intended. The goals of effective communication include creating a common perception, changing behaviors and acquiring information (Brown 2011). Communication of a shared culture and values to human resources in the whole enterprises and infuse the said human resources with the desire to perform highly. It involves motivating the entire firm's human resources. The project manager should assign roles to staff and volunteers conducting monitoring and evaluation be it in data collection, analysis and reporting (Nyonje *et al.*, 2012).

Effective communication of Monitoring and Evaluation results of projects is usually one of the ingredients of good project performance. It provides means of accountability, demonstrating transparency to the Stakeholders and facilitates organizational learning through documenting lessons learned in implementation of the projects and incorporating the same in the subsequent project planning and implementation or through sharing experience with other implementers. Communication during projects can be of many different types such as oral, written and non-verbal. Oral communication is mainly utilized in face-to-face meetings or over the telephone as well as in group meetings and affords a lot more flexibility to the speaker, such as the ability to communicate not only with voice but body language, attitude and nuance. The subtle nuances that can be communicated during verbal communication are not present during written communication. Written communication, on the other hand, is usually more precise. It can be sent through correspondence such as memos, letters or notices. It can also be sent via Email or the project management information system (Ruuska, 2007).

The components in the communications model need to be taken into account when discussing project communications. As part of the communications process, the sender is responsible for making the information clear and complete so that the receiver can receive it correctly, and for confirming that it is properly understood. The receiver is responsible for making sure that the information is received in its entirety, understood correctly, and acknowledged. A failure in communication can negatively impact the project (Phiri, 2015).

In his article dealing with project communication, Ruuska (2007) lists five important roles of communication in project management: Project communication is a supporting activity, with which it is made possible to create an end product from the project, and transfer it to both customers and end users; In order to create a positive and reliable service profile, communication is needed for both profiling and being profiled; Project communication is an informative tool, which communicates to all relative groups what is happening in the project; Orientation activities rely strongly on communication. This is important when different specialists working with project are given proper orientation; by the social nature of people, interaction with each other is needed in order to satisfy the social needs of human nature (Todorović, Petrović, Mihić, Obradović, & Bushuyev, 2015). The importance of communication in the success of a project is immense. Careful communication planning and setting the right expectations with all the project stakeholders is extremely important.

Face to face initial communication within the project team to establish the team dynamics and learning the customer's expectations are the keys to success when starting a project.

2.6 e-Quality assurance and performance

This seeks to assess how the project adheres to the project specifications, deliverables and scope. Right from the onset, a project has set targets or deliverables to be met within certain quality expectations (Hogger *et al*, 2011). Therefore, monitoring, evaluating and controlling the quality and scope ensure that corrective measures are instituted early in the project when shortcomings are discovered and that the project contractor does not deliver shoddy or substandard work. This is achieved by assessing the project against the project design and specifications Gebremedhin, Getachew & Amha, 2010).

Yafiah (2013) indicate that procurement selection criteria of cost, time, quality, project characteristics and external environmental factors have effects on project performance. Feten (2008) found that the most common effects of cost overrun were delay, supplementary agreement, adversarial relations among stakeholders, and budget shortfall of project owners which guides efforts to improve the performance of the construction industry in the future. Aftab, Rahman, Abdullah and Azis (2010) stated that fluctuation in price of material, cash flow and financial difficulties faced by contractors, shortage of site workers, lack of communication between parties, incorrect planning and scheduling by contractors are most severe factors while frequent design changes and owner interference are least affecting factors on construction cost performance.

Shaban (2008) stated that the most important factors affecting the performance of construction projects agreed by the owners, consultants and contractors were: average delay because of closures and materials shortage; availability of resources as planned through project duration; leadership skills for project manager; escalation of material prices; availability of personals with high experience and qualification; and quality of equipment and raw materials in project. Lepartobiko (2012) stated that quality can be assured by identifying and eliminating the factors that cause poor project performance. Jha and Jha (2006) found that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Lack of

contractor experienced topped the quality related cause of project failure. Ling and Bui (2010) discovered that major enablers that lead to project success are foreign experts' involvement in the project, government officials inspecting the project, and very close supervision when new construction techniques are employed. A factor which leads to poor performance is the lack of accurate data on soil, weather, and traffic conditions.

Ideally, if M&E planning has been done well and information about a situation has been collected at the beginning of the intervention, then one has baseline data (Hogger *et al.*, 2011). A baseline survey, simply put, is a study that is done at the beginning of a project to establish the status *quo* before a project is rolled out (Estrella & Gaventa, 2010). In a baseline survey, values for the identified performance indicators are collected as well. The baseline survey, which aims at collecting baseline data about a situation, is an early element in the monitoring and evaluation plan whose information is used to systematically assess the circumstances in which the project commences (Frankel & Gage, 2007). It provides the basis for subsequent assessment of how efficiently the activity is being implemented and the eventual results achieved (Armstrong & Baron, 2013), a very big contribution to influencing project performance.

2.7 Theoretical Literature Review

A theoretical review is a collection of interrelated concepts. It guides research to determine what things to measure, and what statistical relationships to look for (Defee *et al.*, 2010). A good research should be grounded in theory. This study is guided by Program Theory, Technology Acceptance Model (TAM), the Social Theory and Critical Chain Project Management Theory. These theories clearly explained the research in line with the topic.

2.7.1 Program Theory

Program theory of evaluation has grown in use over the past decade. The Program Theory also called a logic model or impact pathway. It is a systematic method for collecting, analyzing, and using information to answer questions about projects, policies and programs, particularly about their effectiveness and efficiency. Creating a logic model is a wonderful way to help visualize important aspects of programs, especially when preparing for monitoring and evaluation (Funnell & Rogers, 2011). It also assesses whether a program is

designed in such a way that it can achieve its intended outcomes. Program theory helps to focus evaluation efforts on key concerns of project implementation. As well, there may be a need to pick the right indicators from among the many available, and one can use “monitoring questions” to select the indicators that will be most helpful. The monitoring questions take the form of “What do we really need to know in order to manage grant-making directed to the achievement of this outcome (Jackson, 2013). The program theory is a guidance theory in the evaluation of projects as it shows the capacity of the program to attend to specific problems that need to be reviewed within projects. It further offers guidance on what areas need to be emphasized on during the evaluation process (Donaldson, 2012).

The use of program theory presents the advantage of offering information that could lead to additional explanations regarding the problem, the solutions and the alternate actions to be carried out in order to obtain the intended results. Further, it can be used to enhance decision making and expand conceptions of solutions to any project problems (Shackman, 2012). However, this theory is limited by its approaches as it requires excessive reliance on a collection of data to guide in the evaluation process, and this may be costly for projects that are working under tight budgetary allocations.

2.7.2 Technology Acceptance Model (TAM)

Davis’ (1989) TAM is widely used to study user acceptance of technology. According to TAM, perceived usefulness (PU) and perceived ease of use (PEOU) influence one’s attitude towards system usage, which influences one’s behavioral intention to use a system, which, in turn, determines actual system usage. The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology (Davis, 1986). The model had two main determinants which explain IT adoption: Perceived Usefulness and Perceived Ease of Use. Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless.

The TAM framework is one of the most cited models in the predictive acceptance of new information technology and computerized systems within organizations, which hypothesizes that the use of a system or technology is well determined by the behavioral intentions of the consumers (Nasri, 2011). This theory posits that the likelihood of system usage is governed by the constructs of perceived usefulness and perceived ease of use, which refers to how the consumer perceives that using that specific system would enhance his/her task outcome and the extent to which the use of the system is free of effort respectively (Davis, 1989). By applying the TAM model, there are factors of perceived usefulness and perceived ease of use to be important antecedents of intentions to use a new system of doing business (Cheah, Teo, Sim, Oon, & Tan, 2011). Technology Acceptance Model (TAM) is relevant to the study as it informs the intention to adopt new technologies in monitoring and evaluation of projects.

2.7.3 The social theory

The social theory plays a major part and role in evaluation practice. Such a theory and prior research are instrumental for providing information on the initial needs assessment and program design. A review of available literature is crucial as it provides knowledge on the effective strategies to use in dealing with the problems at hand. Further, they can provide lessons about what is not effective as such saving program designs and other resources (Donaldson, 2001). The theory is related with the study due to the fact that the study focused on influence of Monitoring and Evaluation on project performance and this is a social accountability which is an important motivation for project performance, a way to improve programs and society.

2.7.4. Critical Chain Project Management Theory

Critical Chain Project Management is the Theory of Constraints logistical application for project operations. It is named after the essential element; the longest chain of dependent resourced tasks in the project. The aim of the solution is to protect the duration of the project, and therefore completion date, against the effects of individual task structural and resource dependency, variation, and uncertainty. The outcome is a robust and dependable approach that will allow us to complete projects on-time, every time, and most importantly within at most 75% of the current duration for single projects and considerably less for individual projects within multi-

project environments. The shorter duration provides a sterling opportunity in the market place to differentiate ourselves from our competitors who deliver poorer outcomes, and late at that, via other project management methods. It also offers the opportunity to deliver more projects overall, in the same amount of time, and at no increase in operating expense, thus significantly improving the bottom line (Youngman, 2009).

2.8 Conceptual framework

The variables in the conceptual framework are discussed under this section. This is to explain how they are related to each other. The conceptual framework links the independent variables to the dependent variable. Njeru et al. (2015) defines conceptual framework as a group of concepts which are systematically organized to provide a focus, a tool and rational for interpretation and integration of information and is usually achieved in pictorial illustrations. In this study, the independent variables that include e-Cost tracking, e-Quality assurance, e-Communication and coordination and e-Time tracking, are the variables that can be manipulated to observe what change is effected on the dependent variable which is performance. There also exists moderating variables that affect the strength of the relationship between the independent and dependent variables in correlation. With each variable, there are indicators which are observable or measurable entities that serve to define the concept of the study.

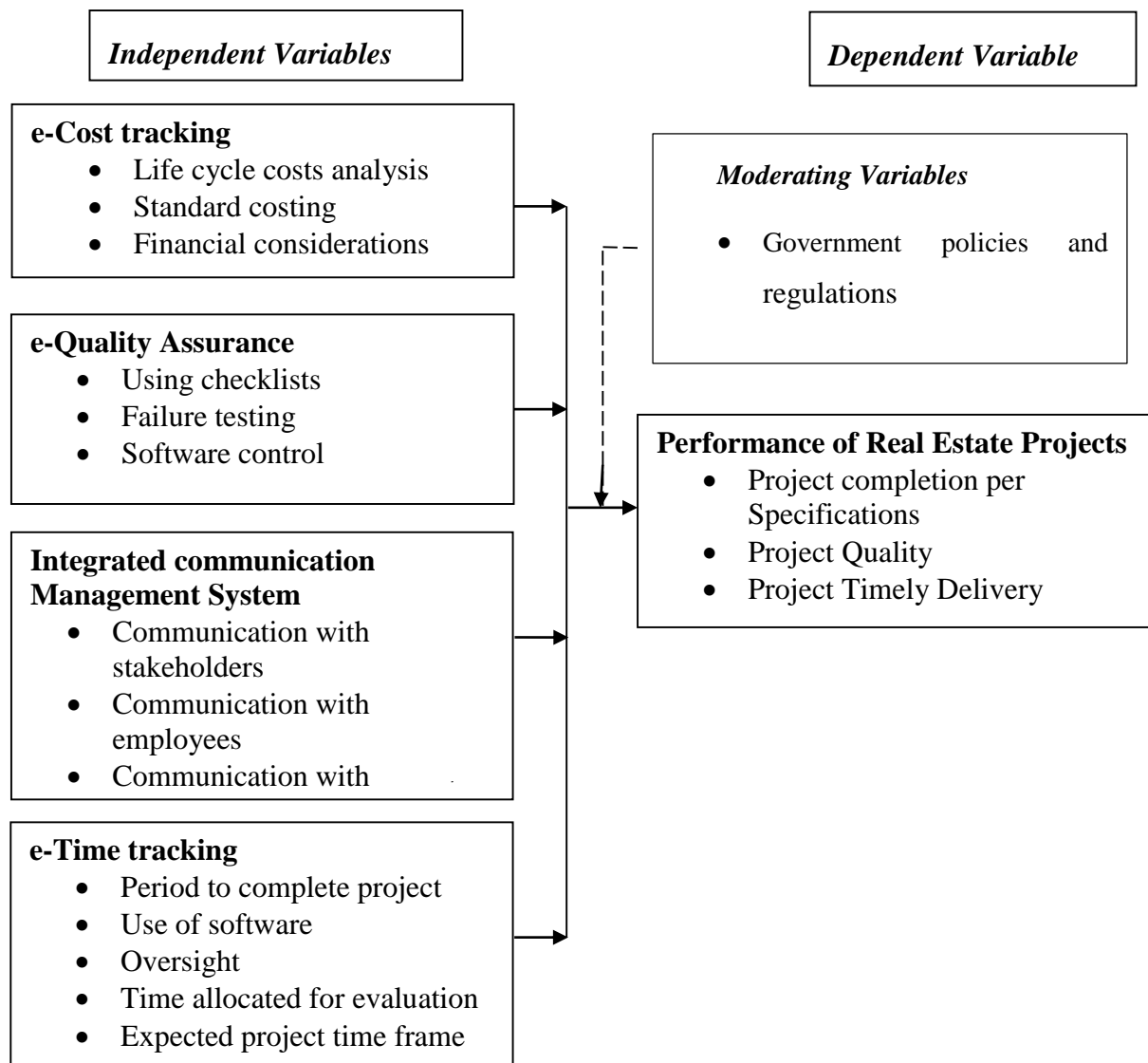


Figure 1: Conceptual

framework

Table 2.1: Knowledge gaps

| Author | Focus of the Study | Methodology Used | Findings | Knowledge Gap | Focus of Current Study |
|------------------------|---|-------------------------------------|---|--|--|
| Lekamparish (2017) | Influence of monitoring and evaluation on project performance in State Corporation in Kenya. | Descriptive research design. | Monitoring and evaluation feedback there is enhanced accountability minimizing project financial mismanagement, enhanced project decision making and the project experience transparency. | Performance of projects was based on accountability and transparency. The study also focused on state corporation. | The current study focuses on real estate firms. Unlike state corporation, real estate firms are purely commercial and must engage in close monitoring and evaluation of projects to make profit. Performance is measured using rate of completion, time and cost constraint. |
| Kamau & Mohamed (2015) | Efficacy of monitoring and evaluation function in achieving project success in Kenya. | Literature review approach. | Management support as a mediating factor between M&E and the Project Success. | Methodology gap. Relied much on qualitative data. We cannot quantify performance brought as a result of e-monitoring and evaluation. | The study quantitative approach through use of questionnaires and check list. |
| Wachaiyu (2016) | To determine the monitoring and evaluation factors influencing success of development projects in Starehe Sub-county. | Descriptive survey research design. | The strength of monitoring team, budgetary allocation, M&E plan and selection of tools and techniques played an important role in determining the success of development projects. | None of the variables employed by the study are used in the current study. | The study employs e-cost tracking, e-time tracking, integrated communication and e-quality management as key elements in assessing project performance of real estate firms. |

| | | | | | |
|----------------------------|---|-------------------------------------|--|---|--|
| Sialala (2016) | Influence of Monitoring and Evaluation Integration on Completion of Road Projects: A Case of Kajiado County. | Descriptive research design. | There was a relationship between integrating Monitoring and Evaluation and on performance of Roads Projects in Kenya. | The study focused on road projects in Kajiado County. | The current study focuses on real estate firms in Nairobi City County. |
| Satankar & Jain (2015) | Success factors for real estate construction projects. | Quantitative research design. | Technical and economic assessment of the required project resources, experience and executive records of the project manager, project strategic planning, time cost and quality management, completion, environmental safety, user affordability and design consideration, cost of individual units and technology influenced project performance. | Comprehensive literature review. | The study quantitative approach through use of questionnaires and check list. |
| Waithera & Wanyoike (2015) | Factors that influence the project monitoring and evaluation performance of youth funded agribusiness projects in Bahati Sub-County, Kenya. | Descriptive survey research design. | Training of staff had a statistically significant influence on project monitoring and evaluation performance of youth funded agribusiness projects. | Conceptual gap and contextual gap. The study focused on factors influencing project monitoring and evaluation of agribusiness projects. | The current study focuses on real estate firms in Nairobi City County by fusing on the influence of e-cost tracking, e-time tracking, integrated communication and e-quality management on project performance of real estate firms. |

2.9 Summary of the Literature Review

The chapter two of this chapter reviewed the various theories that explain the independent and dependent variables. The conceptual framework is drawn up from the reviewed literature in line with the following criteria, title, scope, methodology forming the basis for the critique of literature. It is from these critiques that the research gaps both conceptual and contextual were identified. The next chapter outlines the methodology that the study adopted in order to achieve the stated objectives.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this study was to establish the influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County. This chapter presents the review of the research methodology. Specifically, the chapter discusses the research design, the population of the study, the sample size, the data collection procedure and the data analysis.

3.2 Research Design

The study adopted descriptive survey method. A descriptive survey research design allows for an in-depth analysis and understanding of a particular phenomenon as it exists in the present condition (Cooper & Schindler, 2008). In descriptive survey research design, objectives are predetermined allowing data collection relevant and sufficient to the study problem (Kothari, 2004). This research design facilitates the establishment of the influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County. The research design is chosen due to its adequacy to fulfill the research objectives. According to Upagade and Shende (2013) a descriptive survey is mainly concerned with description of facts only. Descriptive survey attempts to describe or define a subject often by creating a profile of a group of problems, people or events through the collection of data and tabulation of the frequencies on research variables or their interaction as indicated.

3.3 Target Population

According to Kombo and Tromp (2006) population is a group of individuals, objects or items from which samples will be taken for measurement or it is an entire group of persons, or elements that have at least one thing in common. The study focused on 139 real estate projects in Nairobi County. There are 834 personnel that include project managers, assistant project managers and project supervisors for the 139 registered real estate firms in Nairobi County (Department of Land, Housing and Physical Planning, 2017). Therefore, the target population was 139 project managers, 178 assistant project managers and 417 project supervisors. The units of observation were the real estate project managers, assistant project managers and project supervisors.

Table 3.1: Target population

| Category Level | Target Population |
|----------------------------|--------------------------|
| Project Managers | 139 |
| Assistant Project managers | 278 |
| Project supervisors. | 417 |
| Total | 834 |

Source: National Construction Authority, 2019

3.4 Sample Size and Sampling Procedure

A simple definition of a sampling frame is a set of source materials from which the sample is selected (Mugenda & Mugenda, 2003). The definition also encompasses the purpose of sampling frames, which is to provide a means for choosing the particular members of the target population that are to be interviewed in the survey (Bailey, 2008). The sampling frames of this survey were Project Managers, Project supervisors and Assistant Project managers. These formed the unit of observation for the study.

3.4.1 Sample Size

A sample is a subset of a population (Desu, 2012). Marczyk, et al (2005) defined a sample as a subset of the population to be studied. It is a true representative of the entire population to be studied (Leary, 2001). Similarly, sampling is the selection of a subset of individuals from within a population to yield some knowledge about the whole population, especially for the purposes of making predictions based on statistical inference (Scott & Wild, 1986; Black and William, 2004). A good sample should be truly representative of the population, result in a small sampling error, viable, economical, and systematic, whose results can be applied to a universe with a reasonable level of confidence (Kothari, 2004). This study adopted Yamane (1967) simplified formula to calculate the sample size which provided the number of responses that need to be obtained using the equation;

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

Where:

n = sample size

N = population size

e = the level of precision

1 = Constant

This formula assumes a degree of variability (i.e. proportion) of 0.5, the level of precision of 5% and a confidence level of 95%.

$$\begin{aligned} n &= 834 / 1 + 834(0.05)^2 \\ &= 270.34 \approx 270 \text{ personnel} \end{aligned}$$

$$n = 270 \text{ personnel}$$

According Mugenda and Mugenda (2003) and Kothari (2004) a 10% and above of a small population is adequate for a descriptive study. Therefore, this study used 32.4% of the target population and thus the sample size is 270 respondents. Stratified random sampling was used to select the sample under study.

Table 3.2: Sample size

| Category Level | Target Population | Percentage (%) | Sample size |
|----------------------------|-------------------|----------------|-------------|
| Project Managers | 139 | 32.4% | 45 |
| Assistant Project managers | 278 | 32.4% | 90 |
| Project supervisors. | 417 | 32.4% | 135 |
| Total | 834 | 32.4% | 270 |

Source: Researcher, 2019

3.5 Data Collection and Instruments

The main instruments for the study were questionnaires that were administered to registered real estate firms' managers and the real estate developers in Nairobi County. Orodho (2004) defines a questionnaire as an instrument used to gather data, which allows a measurement for or against a particular viewpoint. Orodho emphasizes that a questionnaire has ability to collect a large amount of data in a reasonably quick space of time. Best and Kahn (2008) observe that questionnaires

enables the researcher to explain the purpose of the study and give meaning of the terms that may not be clear. The information collected formed the basis of the study to establish influence of e-monitoring and evaluation on performance of with real estate projects in Nairobi County, Kenya.

The questionnaires contained closed ended questions. Closed ended questions were chosen because they are easier to analyze and facilitate harmonization of information from the respondents. The structured questionnaires consisted of questions which are designed in accordance with the objective of the study. A set of attributes in form of statements were used to capture the opinions of the respondents with regard to the variables of study anchored on a likert scale. The likert measures the level of agreement or disagreement. Likert scales are good in measuring perception, attitude, values and behavior. The likert scales assist in converting the qualitative responses into quantitative values (Upagade & Shende, 2012, Zikmund, Babin, Carr & Griffin, 2010). The questionnaires were administered by two research assistants. Two research assistants made follow ups to pick the fully completed questionnaires from the respondents in the event that respondents had not filled immediately.

3.5.1 Pilot Study

The purpose of the pilot test is to refine the questionnaire so that respondents had no problems in answering the questions and there were no problems in recording the data. In addition, it enabled obtain some assessment of the question's validity and the likely reliability of the data that was collected. Preliminary analysis using the pilot test data can be undertaken to ensure that the data collected will enable the investigative questions to be answered (Saunders, Lewis & Thornhill 2012). According to Mugenda and Mugenda (2003), a pretest sample ranges from 1% to 10% depending on the sample size. In this study 10% of the sample size was used for the pilot test. Therefore, 27 questionnaires were used for pilot study and were not included in the final study sample.

Data collection refers to the process of gathering raw and unprocessed information that can be processed into meaningful information, following the scientific process of data analysis (Gall, Gall & Borg, 2007). Primary data were collected by use of a semi structured questionnaire. Approval letter from the university was obtained to conduct the study. Thereafter, permission was obtained from the National Commission of Science Technology and Innovation (NACOSTI). The

researcher paid courtesy call to the real estate firms requesting for permission to collect data. The questionnaires were distributed and collected at same day to increase the return rate.

In order to check the validity and reliability of the questionnaires in gathering the data required for purposes of the study, a pilot study was carried out. The purpose of pilot testing is to establish the accuracy and appropriateness of the research design and instrumentation (Saunders, Lewis & Thornhill (2009). Newing (2011) states that the importance of pilot testing cannot be overemphasized; you will almost always find that there are questions that people fail to understand or interpret in different ways, places in the questionnaire where they are not sure where to go next, and questions that turn out simply not to elicit useful information. Cooper and Schindler (2006) concur that the purpose of pilot test is to detect weaknesses in design and implementation and to provide proxy for data collection of a probability sample. Once the questionnaire is pilot tested and amended and the sample selected, the questionnaire is then used to collect data in line with Saunders, Lewis and Thornhill (2012).

3.5.2 Validity of the research instrument

Joppe (2010) provides the following explanation of what validity is in quantitative research where Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. Mugenda and Mugenda (2003), validity is the accuracy and meaningfulness of inferences, which are based on the research results. Validity exists if the data measure what they are supposed to measure. In order to test and enhance the validity of the questionnaire, five questionnaires were pilot tested and reviewed with a view to improve validity of the data that was collected (Kothari, 2004).

Validity refers to whether a questionnaire is measuring what it purports to measure (Bryman & Cramer 1997). It describes validity as the degree of congruence between the explanations of the phenomena and the realities of the world. While absolute validity was difficult to establish, demonstrating the validity of a developing measure was very important in research (Bowling, 1997). This study used both construct validity and content validity. For construct validity, the questionnaire was divided into several sections to ensure that each section assessed information for a specific objective, and also ensured that the same closely ties to the conceptual framework for this study. To ensure content validity, the questionnaire was subjected to thorough examination

by two randomly selected real estates projects managers and the supervisor. They were asked to evaluate the statements in the questionnaire for relevance. On the basis of the evaluation, the instrument was adjusted appropriately before subjecting it to the final data collection exercise. Their review comments were used to ensure that content validity is enhanced

3.5.3 Reliability of the Instrument

Joppe (2010) defines reliability as the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. Reliability is the consistency of a set of measurement items (Cronbach, 1951). Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. Reliability refers to the repeatability, stability or internal consistency of a questionnaire (Jack & Clarke, 1998). Cronbach's alpha was used to test the reliability of the measures in the questionnaire (Cronbach, 1995). According to Cooper and Schindler (2003), Cronbach's alpha had the most utility for multi-item scales at the interval level of measurement, requires only a single administration and provides a unique, quantitative estimate of the internal consistency of a scale.

A measure is considered reliable if a person's score on the same test given twice is similar. 10% of the sample size was used for the pilot test. Therefore, 27 questionnaires were subjected to pilot test by issuing them to respondents who were not included in the final study sample. The 27 questionnaires were coded and response input into SPSS which was used to generate the reliability coefficient. The questionnaire response were input into statistical package for social sciences (SPSS) and Cronbach's alpha coefficient generated to assess reliability. The closer Cronbach's alpha coefficient is to 1, the higher the internal consistency reliability (Sekaran, 2006). A coefficient of 0.7 is recommended for a newly developed questionnaire.

3.6 Data collection procedures

The university gave a letter of research approval, authorizing to carry out the research at real estate offices in Nairobi County, before the research onset. The researcher hired and trained two research assistants from within to assist with the data collection exercise. A program of visiting targeted offices is made and appointments with the respondents while at the same time administering the questionnaires to the other respondents. The researcher and the assistants delivered the

questionnaires to the respondents and had them filled in their presence to ensure better understanding of the questions and enhanced reliability. Other respondents who required more time to fill the questionnaires were left with the questionnaires to be collected the following day so as to give them ample time to fill them.

3.7 Data Analysis and presentation

Data analysis is a practice in which raw data is ordered and organized so that useful information can be extracted from it (Gall, Gall & Borg, 2007). After data has been collected through questionnaires, it was prepared in readiness for analysis by editing, handling blank responses, coding, categorizing and keying into statistical package for social sciences SPSS software version 21.0 for analysis. SPSS software version 21.0 was used to produce frequencies, descriptive and inferential statistics. The particular descriptive statistics included frequencies, mean scores and standard deviation. The particular inferential statistics were regression and correlation analysis. Data analysis leads to production of tables, descriptive statistics and inferential statistics. The analyzed data were presented in form of tables, charts and graphs.

The analysis of variance (ANOVA) was checked to reveal the overall model significance. In particular, the calculated f statistic was compared with the tabulated f statistic. A critical p value of 0.05 was used to determine whether the overall model was significant or not. A multivariate regression model was used to show the relationship between the independent variables to the dependent variable as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where;

Y = Performance of real estate projects

X₁ = e-Cost tracking

X₂ = e-Time tracking

X₃ = Integrated communication management system

X₄ = e-Quality assurance

In the model, β_0 = the constant term while the coefficient $\beta_{ii} = 1 \dots 4$ were used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables X_1, X_2, X_3 and X_4 . The error (μ) term capture the unexplained variations in the model.

3.8 Ethical considerations

Basit (2013) highlights ethical concerns should be adhered to before embarking on research. The same guidelines were adhered to during the study. Accordingly, participants were informed of the purpose of the research and assured of confidentiality. Consent was requested from all respondents before conducting the study. The identity of people from whom information is obtained in the course of the study was kept strictly confidential.

3.9 Operational Definition of Variables

The operational definition of a variable is the specific way in which it is measured in that study. Another study might measure the same conceptual measure differently. In this study the operationalization of variables is presented in table 3.3.

Table 3.3: Operationalization of Variables

| Objectives | Variables | Indicators | Scale | Tools of Analysis | Type of analysis |
|---|--|---|--------------------|--|--------------------------------------|
| To establish how e-Cost tracking influences performance of real estate projects in Nairobi County | e-Cost tracking | <ul style="list-style-type: none"> Life cycle costs analysis Standard costing Financial considerations | Ordinal nominal | Mean, standard deviation, correlation and regression | Descriptive and inferential analysis |
| To determine how e-Quality assurance influences performance of real estate projects in Nairobi County | e-Quality assurance | <ul style="list-style-type: none"> Using checklists Failure testing Software control | Ordinal nominal | Mean, standard deviation, correlation and regression | Descriptive and inferential analysis |
| To establish how Integrated Communication Control Systems, influence performance of | Integrated Communication Control Systems | <ul style="list-style-type: none"> Communication with stakeholders Communication with employees | Ordinal nominal | Mean, standard deviation, correlation and regression | Descriptive and inferential analysis |

| Objectives | Variables | Indicators | Scale | Tools of Analysis | Type of analysis |
|--|------------------|--|-----------------|--|--------------------------------------|
| real estate projects in Nairobi County | | <ul style="list-style-type: none"> • Communication with financiers | | | |
| To examine the influence of e-Time tracking on performance of real estate projects in Nairobi County | e-Time tracking | <ul style="list-style-type: none"> • Period to complete project • Use of software • Oversight • Time allocated for evaluation • Expected project time frame | Ordinal | Mean, standard deviation, correlation and regression | Descriptive and inferential analysis |
| Performance of real estate projects in Nairobi County | Performance | <ul style="list-style-type: none"> • Project completion per Specifications • Quality service • Project Timely Delivery | Ordinal nominal | Mean, standard deviation, correlation and regression | Descriptive and inferential analysis |

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter represents the findings, results and interpretation of the variables including the response rate, reliability, descriptive statistics and model assumptions. Correlation, multiple regression and was performed. The independent variables of the study were e-cost tracking, e-quality assurance, Integrated Communication Management Systems and e-time tracking and how they affect the dependent variable which performance of real estate projects in Nairobi County.

4.2 Response Rate

The number of questionnaires that were administered was 270 and a total of 200 questionnaires were properly filled and returned but some of the respondents returned the questionnaires half-filled while others did not return them completely despite a lot of follow up. The response rate result is shown in Table 4.1.

Table 4.1: Response Rate

| Response | Frequency | Percent |
|-----------------|------------------|----------------|
| Returned | 200 | 74.1% |
| Unreturned | 70 | 25.9% |
| Total | 270 | 100% |

Out of the 270 questionnaires administered 200 were filled and returned representing 74.1 percent. This response rate is considered satisfactory to make conclusions for the study. Bailey (2000) stated that a response rate of 50% is adequate while a response rate greater than 70% is very good. This implies that based on this assertion, the response rate in this case of 74.1% is therefore very good. The data collection procedures used could have attributed to this high response rate. These included use of competent research assistants, pre-notification of respondents and voluntary participation by respondents; drop and pick of questionnaires to allow for ample time to fill; assurance of confidentiality and anonymity and follow up calls to clarify queries from the respondents.

4.3 Distribution of respondents by demographic characteristics

For the study to establish to establish the influence of e-monitoring and evaluation on performance of real estate projects, it was considered important to establish the background information of the respondents which included gender, age, level of education and work experience of the respondents. This was inspired by the need to establish whether there exists any close relationship among respondents' demographic characteristics and performance of real estate projects. Methusella (2000) observed that performance factors are strongly associated to different demographic factors. The demographics characteristics of respondents are presented in Table 4.2.

Table 4.2: Demographics characteristics of respondents

| Demographic characteristic | Frequency | Percent |
|-----------------------------------|------------------|----------------|
| Gender | | |
| Male | 113 | 56.5 |
| Female | 87 | 43.5 |
| Age | | |
| Below 30 years | 75 | 10.2 |
| 31 – 40 years | 68 | 43.3 |
| 41– 50 years | 29 | 31.6 |
| Over 51 years | 28 | 15.0 |
| Level of education | | |
| Diploma | 30 | 15.0 |
| Undergraduate | 123 | 61.5 |
| Post graduate | 47 | 23.5 |
| Work duration | | |
| Less than 5 years | 62 | 31.0 |
| 5 - 10 years | 86 | 43.0 |
| 11- 15 years | 34 | 17.0 |
| More than 15 years | 18 | 9.0 |

The findings in Table 4.2 indicated that of the total respondents, majority 56.5% were males while 43.5% were females. The results imply that majority of staff are males who are dominant in real estate sector. The results agree with Ling, Sulaiman and Arif (2015) that the participation and contribution of women also have shown a significant growth across years in the real estate sectors. Results further showed that most 10.2% of the respondents were aged 30 years and below, most 43.3% of the respondents were aged 31-40 years, 31.6% of the respondents were 41– 50 years of

age, 31.6% were 36 – 45 years of age while 15.0% of the respondents were over 51 years of age. Studies show that age has a relationship with advancement. The results are in line with van der Heijden, Schalk, van Veldhoven, van Veldhoven and Dorenbosch (2008) that career opportunities have a negative association with age, a positive association with proactivity, and a positive association with career development-orientated human resource practices.

Demographic results in Table 4.2 further indicated that majority of the respondents 61.5% of the respondents had undergraduate degree, 15.0% had diploma while 23.5% had graduate degree. This implies that workers at the real estate firms must be well educated, possessing relevant skills to monitor and evaluate real estate projects. The results are in agreement with Dokata (2017) that educational level of workers influences the growth and performance of real estate firms.

It was also established that most 43.0% of the respondents had worked in the real estate firms for 5 - 10 years, 31.0% of the respondents for less than 5 years, 17.0% for 11- 15 years and 9.0% for more than 15 years. Employers especially value relevant work experience across all levels and job roles within the real estate industry. The results are in line with Lu Shan (2014) stated that Chinese construction firms employed experienced professional expertise which enabled the firms to complete their projects within the time schedule and budgeted cost.

Further, the study sought to understand whether the real estate firms had adopted technology in monitoring and evaluation. Results of the study are presented in Table 4.3. It was established that majority 55.5% of the real estate firms had not employed technology in monitoring and evaluation. This could be an indication of cost overruns, delays and poor quality.

Table 4.3: Demographics characteristics of respondents

| Has your firm adopted technology in monitoring and evaluation | Frequency | Percent |
|--|------------------|----------------|
| No | 111 | 55.5 |
| Yes | 89 | 44.5 |
| Total | 200 | 100.0 |

4.4 Reliability Test

The study used Cronbach alpha to test for reliability of data. Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used

under the same condition with the same subjects. Reliability test was conducted to test for data collection instruments' ability to produce consistent and accurate results. Cronbach alpha was used to test for reliability of data. The acceptance value of 0.70 was used as cut-off of the reliability for the study. Results are presented in Table 4.4.

Table 4.4: Reliability Statistics

| Variable | Cronbach alpha | Items | Comments |
|--|-----------------------|--------------|-----------------|
| e-cost tracking | .799 | 6 | Acceptable |
| e-quality assurance | .801 | 4 | Acceptable |
| e time tracking | .857 | 5 | Acceptable |
| Integrated communication management system | .850 | 6 | Acceptable |
| Performance of Real estate Projects | .892 | 15 | Acceptable |

The study findings indicated that the data instruments were reliability with a Cronbach alpha Value of above 0.70. Castillio (2009) provided the following rules of thumb: >0.9 – Excellent, >0.8 – Good, >0.7 – Acceptable, >0.6 – Questionable, >0.5 – Poor and <0.5 – Unacceptable. The findings indicated that the Cronbach alpha for each of the variables was above the lower limit of acceptability thus reliable with e-cost tracking having a coefficient of 0.799; e-quality assurance 0.801; e-time tracking 0.857; Integrated communication management system 0.850 and performance of real estate projects 0.892 as shown in Table 4.3.

4.5 Descriptive Analysis

This section contains descriptive analysis for e-cost tracking, e-quality assurance, Integrated Communication Management Systems and e-time tracking and performance of real estate projects in Nairobi County. A likert scale with options of strongly disagree, disagree, don't know, agree and strongly agree were presented for answering by respondents. The results were presented in form of mean and standard deviations.

4.5.1 e-cost tracking and performance of real estate projects

The first objective of this study was to establish how e-cost tracking influences performance of real estate projects in Nairobi County. A Likert scale of 1 to 5 (1 = strongly disagree, 2 = Disagree

3 = don't know, 4 = Agree, 5 = strongly agree) was used and the mean response rate from the respondents calculated. For the purposes of interpretation 4 & 5 (agree and strongly agree) were grouped together as agree, 1 & 2 (strongly disagree and disagree) were grouped as disagree while 3 was don't know. The results of this study are as depicted in Table 4.5.

Table 4.5: E-cost tracking and performance of real estate projects

| e-cost tracking | Mean | SD |
|---|-------------|-----------|
| Planning and performance monitoring in government have been predominantly characterized by a silo approach | 3.8 | 1.2 |
| Planning and performance monitoring in government has resulted in a situation where planning, budgeting, and reporting and monitoring and evaluation functions are done by different sections in institutions in isolation of each other. | 3.7 | 1.3 |
| Challenges of performance monitoring in government include the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information. | 3.8 | 1.2 |
| Monitoring and evaluation budget should be about 5 to 10 percent of the entire budget | 3.7 | 1.1 |
| The project budget should provide a clear and adequate provision for monitoring and evaluation events. | 3.8 | 1.3 |
| Monitoring and evaluation budget can be obviously delineated within the overall project budget to give the monitoring and evaluation function the due recognition it plays in project running | 3.8 | 1.3 |

Table 4.4 showed that majority of respondent agreed that planning and performance monitoring in government have been predominantly characterized by a silo approach, with mean score of 3.8 and standard deviation is 1.2 implying that the responses were clustered around the mean response. The results also showed that majority of the respondents agreed that planning and performance monitoring in government has resulted in a situation where planning, budgeting, and reporting and monitoring and evaluation functions are done by different sections in institutions in isolation of each other with mean score of 3.7 and standard deviation is 1.3 implying the responses were clustered around the mean response. The results also showed that majority of the respondents agreed that challenges of performance monitoring in government include the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information with mean score for place is 3.8 and standard deviation is 1.2 implying that the responses were clustered around the mean response.

Further, respondents agreed that monitoring and evaluation budget should be about 5 to 10 percent of the entire budget with mean score for place is 3.7 and standard deviation is 1.1 implying that implying that the responses were clustered around the mean response. The study established that majority of the respondents agreed that project budget should provide a clear and adequate provision for monitoring and evaluation events with mean score for place is 3.8 and standard deviation is 1.3 implying that implying that the responses were clustered around the mean response. Majority of the respondents agree that monitoring and evaluation budget can be obviously delineated within the overall project budget to give the monitoring and evaluation function the due recognition it plays in project running with mean score for place is 3.8 and standard deviation is 1.3 implying that majority of respondents did not agree to the statement.

4.5.2 E-quality assurance and performance of real estate projects

The second objective of this study was to determine how e-Quality assurance influences performance of real estate projects in Nairobi County. A Likert scale of 1 to 5 (1 = strongly disagree, 2 = Disagree 3 = don't know, 4 = Agree, 5 = strongly agree) was used and the mean response rate from the respondents calculated. For the purposes of interpretation 4 & 5 (agree and strongly agree) were grouped together as agree, 1 & 2 (strongly disagree and disagree) were grouped as disagree while 3 was don't know. The results of this study are as depicted in Table 4.6.

Table 4.6: E-quality assurance and performance of real estate projects

| e-Quality tracking | Mean | Standard Deviation |
|---|-------------|---------------------------|
| Thorough checklists is done before kick start of project | 2.4 | 1.3 |
| There is need to conduct failure testing for quality monitoring | 3.6 | 1.3 |
| Adopting right software to check quality control I required | 3.6 | 1.3 |
| Baseline surveys determine quality state of the project | 3.5 | 1.3 |

Table 4.6 showed that majority of respondents did not agree that thorough checklists is done before kick start of project, with mean score of 2.4 and standard deviation is 1.3 implying that the responses were clustered around the mean response. The results also showed that majority of the respondents agreed that there is need to conduct failure testing for quality monitoring with mean score of 3.6 and standard deviation is 1.3 implying the responses were clustered around the mean

response. The results also showed that majority of the respondents agreed that adopting right software to check quality control I required with mean score for place is 3.6 and standard deviation is 1.3 implying that the responses were clustered around the mean response. Further, respondents agreed that baseline surveys determine quality state of the project with mean score for place is 3.5 and standard deviation is 1.3 implying that implying that the responses were clustered around the mean response.

4.5.3 Integrated Communication Management Systems and performance of real estate projects

The third objective of this study was to establish how Integrated Communication Management Systems, influence performance of real estate projects in Nairobi County. A Likert scale of 1 to 5 (1 = strongly disagree, 2 = Disagree 3 = don't know, 4 = Agree, 5 = strongly agree) was used and the mean response rate from the respondents calculated. For the purposes of interpretation 4 & 5 (agree and strongly agree) were grouped together as agree, 1 & 2 (strongly disagree and disagree) were grouped as disagree while 3 was don't know. The results of this study are as depicted in Table 4.7.

Table 4.7: Integrated Communication Management Systems and performance of real estate projects

| Integrated communication management system | Mean | SD |
|---|-------------|-----------|
| Use of information systems influence project quality/output | 3.7 | 1.3 |
| Information Systems improve Project Information Accessibility | 3.7 | 1.2 |
| Information Systems improve project timelines | 3.6 | 1.3 |
| Information technology is needed when communicating with stakeholders | 3.7 | 1.3 |
| Information technology is needed when Communication with employees | 3.5 | 1.3 |
| Information technology is needed when Communication with financiers | 3.7 | 1.2 |

Table 4.7 showed that majority of respondent agreed that use of information systems influence project quality/output, with mean score of 3.7 and standard deviation is 1.3 implying that the responses were clustered around the mean response. The results also showed that majority of the respondents agreed that information systems improve project information accessibility with mean score of 3.7 and standard deviation is 1.2 implying the responses were clustered around the mean

response. The results also showed that majority of the respondents agreed that information systems improve project timelines with mean score for place is 3.6 and standard deviation is 1.3 implying that the responses were clustered around the mean response.

Further, respondents agreed that information technology is needed when communicating with stakeholders with mean score for place is 3.7 and standard deviation is 1.3 implying that implying that the responses were clustered around the mean response. The study established that majority of the respondents agreed that information technology is needed when communication with employees with mean score for place is 3.5 and standard deviation is 1.3 implying that implying that the responses were clustered around the mean response. Majority of the respondents agree that information technology is needed when communication with financiers with mean score for place is 3.7 and standard deviation is 1.2 implying that majority of respondents did not agree to the statement.

4.5.4 E-Time tracking and performance of real estate projects

The fourth objective of this study was to examine the influence of e-time tracking on performance of real estate projects in Nairobi County. A Likert scale of 1 to 5 (1 = strongly disagree, 2 = Disagree 3 = don't know, 4 = Agree, 5 = strongly agree) was used and the mean response rate from the respondents calculated. For the purposes of interpretation 4 & 5 (agree and strongly agree) were grouped together as agree, 1 & 2 (strongly disagree and disagree) were grouped as disagree while 3 was don't know. The results of this study are as depicted in Table 4.8.

Table 4.8: e-Time tracking and performance of real estate projects

| e-Time tracking | Mean | SD |
|---|-------------|-----------|
| Monitoring gives information on where a policy, program, or project is at any given time (and over time) relative to respective targets and outcomes. | 3.7 | 1.2 |
| Evaluation gives evidence of why targets and outcomes are or are not being achieved. | 3.6 | 1.3 |
| Evaluation is a complement to monitoring in that when a monitoring system sends signals that the efforts are going off track (for example, that the target population is not making use of the services, that costs are accelerating, that there is real resist | 3.7 | 1.3 |
| An M&E system should be regarded as a long-term effort, as opposed to an episodic effort for a short period or for the duration of a specific project, program, or policy | 3.6 | 1.4 |
| Sustaining such systems within governments or organizations recognizes the long-term process involved in ensuring utility (for without utility, there is no logic for having such a system). | 3.7 | 1.3 |

Table 4.8 showed that majority of respondent agreed that monitoring gives information on where a policy, program, or project is at any given time (and over time) relative to respective targets and outcomes, with mean score of 3.7 and standard deviation is 1.2 implying that the responses were clustered around the mean response. The results also showed that majority of the respondents agreed that evaluation gives evidence of why targets and outcomes are or are not being achieved with mean score of 3.6 and standard deviation is 1.3 implying the responses were clustered around the mean response. The results also showed that majority of the respondents agreed that evaluation is a complement to monitoring in that when a monitoring system sends signals that the efforts are going off track (for example, that the target population is not making use of the services, that costs are accelerating, that there is real resist with mean score for place is 3.7 and standard deviation is 1.3 implying that the responses were clustered around the mean response.

Further, respondents agreed an M&E system should be regarded as a long-term effort, as opposed to an episodic effort for a short period or for the duration of a specific project, program, or policy with mean score for place is 3.6 and standard deviation is 1.4 implying that implying that the responses were clustered around the mean response. The study also established that majority of the respondents agreed that sustaining such systems within governments or organizations recognizes the long term process involved in ensuring utility (for without utility, there is no logic for having such a system) with mean score for place is 3.7 and standard deviation is 1.3 implying that implying that the responses were clustered around the mean response.

4.5.5 Performance of real estate projects in Nairobi County

The study sought to assess the performance of real estate projects in Nairobi County. Performance of real estate projects was measured in terms of number of real estate projects completed within a given time frame, variation cost of the actual from the budgeted and quality of projects implemented over a span of five years. The results of this study are as depicted in Table 4.9a-4.9c.

Table 4.9a: Number of projects completed 2014-2018

| Year/projects | 1 to 3 projects | 4 to 6 projects | 7 to 10 projects | 11 to 13 projects | Over 14 | Mean | Standard Deviation |
|---------------|-----------------|-----------------|------------------|-------------------|---------|------|--------------------|
| 2014 | 40.0% | 30.0% | 7.5% | 7.5% | 15.0% | 2.3 | 1.4 |
| 2015 | 44.5% | 44.5% | 3.5% | 5.0% | 2.5% | 1.8 | 0.9 |
| 2016 | 6.5% | 6.0% | 71.5% | 2.5% | 13.5% | 3.1 | 0.9 |
| 2017 | 15.5% | 15.5% | 14.5% | 31.5% | 23.0% | 3.3 | 1.4 |
| 2018 | 11.0% | 10.5% | 12.0% | 36.0% | 30.5% | 3.6 | 1.3 |

Results in Table 4.9a showed that in 2014 and 2015, 1-6 projects were completed. This could be an indication of inefficiency. In 2016, 7-10 projects were completed indicated an improvement in the sector. In 2017 and 2018 majority of projects completed were over 11 real estate projects, an indication of great improvement resulting from the use of e-time tracking in the management real estate projects. Table 4.9b shows the variation cost of the actual from the budget between 2014 and 2018.

Table 4.9b: Variation cost of the actual from the budget 2014-2018

| variation cost of the actual from the budget | Less than Ksh 1,000,000 | Ksh2,000,000- 5,000,000 | 5,001,000- 10 million | 10million- 20million | Over Ksh 20Million | Mean | SD |
|--|-------------------------|-------------------------|-----------------------|----------------------|--------------------|------|-----|
| 2014 | 3.0% | 6.0% | 1.0% | 51.0% | 39.0% | 4.2 | 0.9 |
| 2015 | 16.5% | 12.5% | 9.5% | 35.0% | 26.5% | 3.4 | 1.4 |
| 2016 | 8.0% | 8.5% | 71.0% | 8.0% | 4.5% | 2.9 | 0.8 |
| 2017 | 32.0% | 57.0% | 3.5% | 3.5% | 4.0% | 1.9 | 0.9 |
| 2018 | 45.5% | 39.0% | 5.0% | 3.5% | 7.0% | 1.9 | 1.1 |

Results in Table 4.9b showed that in 2014 and 2015, the variation cost of the actual from the budget was greatest being over Ksh.10million implying cost inefficiency. In 2016, the variation cost of the actual budget was over Ksh. 5,001,000-10 million implying improvement in cost tracking. In

2014 and 2015 the variation cost of the actual from the budget was Ksh2, 000,000-5,000,000 and Less than Ksh 1,000,000 respectively an indication of great improvement resulting from the use of e-cost tracking in the management real estate projects. Table 4.9c shows the quality of projects implemented between 2011 and 2015.

Table 4.9c: Quality of projects implemented 2014-2018

| Yea/Quality of projects implemented | 0 to 20 % | 21 to 40% | 41 to 60% | 61 to 80% | Over 81% | Mean | SD |
|-------------------------------------|-----------|-----------|-----------|-----------|----------|------|-----|
| 2014 | 45.0% | 26.0% | 11.0% | 8.5% | 9.5% | 2.1 | 1.3 |
| 2015 | 27.0% | 41.0% | 12.5% | 7.0% | 12.5% | 2.4 | 1.3 |
| 2016 | 12.0% | 16.0% | 43.0% | 12.5% | 16.5% | 3.1 | 1.2 |
| 2017 | 14.0% | 16.0% | 15.5% | 34.0% | 20.5% | 3.3 | 1.3 |
| 2018 | 7.0% | 18.0% | 16.0% | 20.5% | 38.5% | 3.7 | 1.3 |

Results in Table 4.9c showed that in 2011, the quality of most real estate projects lied in between 0 to 20 %. In 2012, the quality of real estate projects improved to 21 to 40% an indication of improving quality. In 2013, the quality of most of real estate projects was between 41 and 60%. In 2014 and 2015 the quality of the majority of real estate projects was over 61%, an indication of great improvement resulting from the use of e-quality tracking in the management real estate projects.

4.6 Correlation Analysis

Preliminary analysis was carried out to determine whether there were significant associations between e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking and performance of real estate projects in Nairobi County. In this study, Pearson’s product-moment correlation coefficient (r) was used to explore relationships between the variables, specifically to assess both the direction and strength. This was crucial to assess the nature of relationships existing between the variables before carrying out further analysis.

Pearson’s product-moment correlation coefficient (r) was used to examine the extent of correlation between the variables of study and to show the strength of the linear association between the variables in the regression. r ranges between ± 1 . Where $r = +0.7$ and above it indicates a very strong relationship; $r = +0.5$ to below 0.7 is a strong relationship; $r = 0.3-0.49$ is a moderate relationship

while $r=0.29$ and below indicates a weak relationship. Where $r=0$ it indicates that there is no relationship (Esther- Smith, Thorge & Love, 1999). The results of correlation analysis are presented in Table 4.10.

Table 4.10: Correlation Coefficients Matrix

| | | Performance of Real estate Projects | e-cost tracking | e-quality tracking | e-time tracking | Integrated communication management system |
|---|---|--|--------------------|-----------------------|--------------------|---|
| Performance of Real estate Projects | Pearson Correlation Sig. (2-tailed) | 1.000 | | | | |
| e-cost tracking | Pearson Correlation Sig. (2- tailed) | .535** | 1.000 | | | |
| e-quality tracking | Pearson Correlation Sig. (2- tailed) | .582** | .311** | 1.000 | | |
| e-time tracking | Pearson Correlation Sig. (2- tailed) | 0.000 | 0.000 | | 1.000 | |
| Integrated communication management system | Pearson Correlation Sig. (2- tailed) | .490** | .286** | .324** | 0.000 | 1.000 |
| | | 0.000 | 0.000 | 0.000 | 0.000 | |
| | | .518** | .194** | .308** | .333** | 1.000 |
| | | 0.000 | 0.006 | 0.000 | 0.000 | |

** Correlation is significant at the 0.01 and 0.05 level (2-tailed).

Results in Table 4.10 indicated that there was a significant positive association between e-cost tracking and performance of real estate projects in Nairobi County ($r=.535$, $p=0.000$). E-cost monitoring seeks to assess how well the project adheres to the planned budget so as to avoid or reduce cost overruns. This is done by auditing the expenditures and costs incurred at every phase of the project on capital, service provision and labour. The results are in agreement with Satankar

and Jain (2015) who conducted a study on success factors for real estate construction projects found that the cost management is a critical success factors in construction projects.

The results also showed that there is a significant positive association between e-quality tracking and performance of real estate projects in Nairobi County ($r=.582$, $p=0.000$). E-quality can be assured by identifying and eliminating the factors that cause poor project performance. The approach of earned value management development is aimed at monitoring project progress-based quality. Therefore, monitoring, evaluating and controlling the quality and scope ensure that corrective measures are instituted early in the project when shortcomings are discovered and that the project contractor does not deliver shoddy or substandard work. The results are in line with Wachamba (2013) who did a study by looking at the determinants influencing the effectiveness of M&E systems in NGO's and found quality to be an important contributor towards project performance. According to Kujala, Brady and Putila (2014) real estate firms face numerous challenges related to cost tracking, cost estimation, cost control and monitoring.

Results further indicated that there was a significant positive association between e-time tracking performance of real estate projects in Nairobi County ($r=.490$, $p=0.000$). Most of projects do not meet time undermining the performance of real estate firms. Project success has traditionally been measured by the extent to which it meets timely completion within budget. Time presents itself as a control measure of the rate of execution plan of a project. The results are in agreement with Maunda and Moronge (2016) who conducted a study on the influence of project life cycle management on completion of public projects and time management influence completion of public projects.

The results also showed that there was a significant positive association integrated communication management system and performance of real estate projects in Nairobi County ($r=.490$, $p=0.000$). Communication is the basis of everything and is thus the key to effective project management. Effective communication is one of the main elements of project management. Communication is a critical part between people, information, and ideas, and communication is the basis for project performance in organization. The results are in agreement with Kovacic and Müller (2014) communication is one of a success factor in the management of real estate projects.

4.7 Statistical Assumptions

Statistical tests rely upon certain assumptions about the variables used in the analysis. Osborne and Waters (2014), opine that when these assumptions are not met the results may not be valid. They further argue that this may result in a type I or type II error, or over or under-estimation of significance or effect size(s). It is therefore important to pretest for these assumptions for validity of their results. Osborne, Christensen, and Gunter (2001) observed that few articles report having tested assumptions of the statistical tests they rely on for drawing their conclusions.

According to Osborne and Waters (2014), not pretesting for these assumptions has led to a situation where there is rich literature in education and social science, but questions into the validity of many of these results, conclusions, and assertions still exist. Testing for assumptions is beneficial as it ensures that an analysis meets the associated assumptions and helps avoid type I and II errors (Osborne and Waters, 2014; Owino, 2014). Prior to data analysis, assumptions for normality and multicollinearity were checked.

4.7.1 Multicollinearity Test

Multicollinearity exists when two or more of the predictors in a regression model are moderately or highly correlated thereby limiting the research conclusions to be drawn. According to Zainodin, Noraini, and Yap (2011), multicollinearity refers to the presence of correlations between the predictor variables. In severe cases of perfect correlations between predictor variables, multicollinearity can imply that a unique least squares solution to a regression analysis cannot be computed (Field, 2009). According to Field (2009) VIF values in excess of 10 is an indication of the presence of Multicollinearity. Multicollinearity inflates the standard errors and confidence intervals leading to unstable estimates of the coefficients for individual predictors. Multicollinearity was assessed in this study using the Variance Inflation Factor (VIF) as shown in Table 4.12.

Table 4.11: Multicollinearity Test

| Variables | Collinearity Statistics | |
|-----------------|-------------------------|-------|
| | Tolerance | VIF |
| e-cost tracking | .862 | 1.160 |

| | | |
|--|------|-------|
| e-quality assurance | .808 | 1.238 |
| e-time tracking | .806 | 1.240 |
| Integrated communication management system | .841 | 1.189 |

Results were presented in Table 4.12. A variance inflation factor test was conducted to test for multicollinearity of the predictors and a value less than 10 is acceptable. E-cost tracking had V.I.F value of 1.160 which is less than 10 implying there is no multicollinearity. E-quality assurance had a V.I.F value of 1.238 means that there is no multicollinearity since VIF is less than 10. The results indicated that e-time tracking had a V.I.F value of 1.240 while integrated communication management system had a V.I.F value of 1.189 implying there is no multicollinearity since VIF is less than 10. Regression could thus be conducted to establish influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County, Kenya.

4.8 Regression Analysis

This section contains inferential analysis for e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking and performance of real estate projects in Nairobi County. Inferential statistics in this section include model fitness, ANOVA tests and regression coefficients. The results presented in Table 4.13 present the fitness of model used of the regression model in explaining the study phenomena. E-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking, were found to be satisfactory in explaining performance of real estate projects in Nairobi County. This is supported by coefficient of determination also known as the R square of 60.9%. This means that e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking explain 60.9% of the variations in the dependent variable which is performance of real estate projects in Nairobi County. Results of the model fitness back up the study by Brière, et al., (2015) who identified that project performance is influenced by, cost, time, quality, safety and and rate of completion. Bredin and Söderlund (2013) suggest that project performance is when the organizational goals and objectives are achieved, within time, within cost while utilizing the assigned resources effectively and efficiently.

Table 4.13: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---|----------|-------------------|----------------------------|
|-------|---|----------|-------------------|----------------------------|

| | | | |
|------|------|------|--------|
| .780 | .609 | .601 | .18512 |
|------|------|------|--------|

The ANOVA results are presented in Table 4.14. Table 4.14 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. Further, the results imply that e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking are good predictors of performance of real estate projects in Nairobi County. This was supported by an F statistic of 75.984 and the reported p value (0.000) which was less than the conventional probability of 0.05 significance level. The findings for F calculated (75.984) was also compared against the F critical value ($F_{4,195}$) of 5.6281 calculated from the F tables. Since the F calculated was greater than F critical ($75.984 > 5.6281$), the model is significant.

Table 4.13: Analysis of Variance

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|-----|-------------|--------|------|
| Regression | 10.416 | 4 | 2.604 | 75.984 | .000 |
| Residual | 6.683 | 195 | .034 | | |
| Total | 17.099 | 199 | | | |

Regression of coefficient results is presented in Table 4.15. Regression of coefficients showed that e-cost tracking and performance of real estate projects in Nairobi County have a positive and significant relationship ($r=.259$, $t=6.652$, $p<0.05$). The coefficient of .310 shows that a unit improvement in e-cost tracking would lead to an increase in the performance of real estate projects in Nairobi County by .259 units. Poor cost tracking in construction project is a common problem worldwide resulting in significant amount of cost overrun. Construction cost management is the most important function for project success and the construction project performance is generally expressed in terms of cost and its variance from the budget. This needs serious attention for improving the construction cost management as rarely projects are completed within budget. Project cost tracking process is the one and most essential and common issue in the entire real estate industry. Cost tracking ensures that the contract amount is within the cost limit of client's approved budget. Project cost tracking is all about controlling cost of the resources needed to complete project activities. The results are in agreement with Yismalet and Alemu (2018) that efficient project cost management system are among the highest responsible factors for obtaining

low profit. According to Vasista (2017) cost element influences project success when all other elements or factors other than cost are represented in terms of cost factor along with the contract conditions as basic rules.

Table 4.14: Regression of coefficient

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--|-----------------------------|------------|---------------------------|-------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .379 | .144 | | 2.630 | .009 |
| e-cost tracking | .259 | .039 | .321 | 6.652 | .000 |
| e-quality assurance | .272 | .041 | .330 | 6.626 | .000 |
| e-time tracking | .144 | .037 | .195 | 3.918 | .000 |
| Integrated communication management system | .175 | .030 | .289 | 5.920 | .000 |

Optimal Régression Model

$$Y = .379 + .259X_1 + .272X_2 + .1448X_3 + .175X_4$$

Where

Y = Performance of real estate projects in Nairobi County

X₁ = e-cost tracking

X₂ = e-quality assurance

X₃ = e-time tracking

X₄ = Integrated communication management system

The results also revealed that e-quality assurance and performance of real estate projects in Nairobi County have a positive and significant relationship ($r=.272$, $t=6.626$, $p<0.05$). The coefficient of

.272 shows that a unit improvement in e-quality assurance would lead to an increase in the performance of real estate projects in Nairobi County by .272 units. E-quality assurance is a comprehensive program which includes both planning and quality control. E-quality assurance involves identifying which quality standards are relevant to the project and determining how to satisfy them. It is one of the key facilitating processes when undertaking a project and should be performed. E-quality assurance is all the planned and systematic activities implemented within the quality system to provide confidence that the project will satisfy the required quality standards. It should be performed throughout the project. Project quality can also be affected due to construction delays since the construction team usually dedicates less time to quality control when the main concern is completing the project on time. When this is the case, workers are usually pushed to work overtime and to increase the production rate, which very often entails failures and reworks. The results are in line with Leong, Zakuan, Mat Saman, Ariff and Tan (2014) that project performance in the construction sector is dependent on quality assurance.

The results also revealed that e-time tracking and performance of real estate projects in Nairobi County have a positive and significant relationship ($r=.144$, $t=3.918$, $p<0.05$). The coefficient of .144 shows that a unit improvement in e-time tracking would lead to an increase in the performance of real estate projects in Nairobi County by .144 units. There are methods that will facilitate efficient project performance. Time tracking is important in any construction project. Without proper time management, many problems will occur such as extension of time or time overrun. E-time tracking have proven to be an efficient approach, which would help owners and contractors in the real estate industry in upgrading their management capabilities and enable them to efficiently complete the construction projects and attain development goals. Lack of subcontractor's knowledge and awareness of the importance of project time management tools and techniques are still major obstacles toward the efficient project management process in real estate industry. The results agree with Solís-Carcaño, Corona-Suárez and García-Ibarra (2015) that there exist a statistical dependence between project time management processes and the schedule performance of construction projects. El-Sawalhi and Enshassi (2012) noted that contemporary project time management tools are critical in construction industry. The results also agree with Nasir, Nawi and Radzuan (2016) that there is a relationship between time management in construction industry and project management performance.

The results also showed that integrated communication management system and performance of real estate projects in Nairobi County have a positive and significant relationship ($r=.175$, $t=5.920$, $p<0.05$). The coefficient of $.175$ shows that a unit improvement in integrated communication management system would lead to an increase in the performance of real estate projects in Nairobi County by $.175$ units. Integrated communication in project management and in project is very important point. The common management skill of effective communication is crucial to project success because project management involves formal and informal communication at different levels in the organization. communication includes all the activities and behavior by which information or ideas are transferred between the project manager and individuals working on the project. The project manager must give directions, hold meetings, and relay information and ideas to and from the project team members, superiors, clients, contractors, functional managers, other project managers and outsider personnel. Miscommunication or lack of communication creates challenges for projects. Communicating project information among stakeholders is critical to the success of the project and uses different means. Project Communications Management includes the process required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. The results are in line with Samáková, Sujánová and Koltnerová (2013) who noted that project management communication is significantly important during project management. The results are also in agreement with Abuya (2015) that effective communication influences project performance. According to Affare (2012) poor communication results to project delays, project cost overrun and project abandonment. Project communications strongly affect the performance of professionals within the real estate industry.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter gives a summary of the findings in line with the specific objectives of the study, conclusions drawn, and the necessary recommendations made for the study including suggested areas of further study to enrich relevant knowledge under the study.

5.2 Summary of the Findings

The general objective of this study was to establish influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County, Kenya. The specific objectives were to; establish how e-cost tracking, determine how e-quality assurance, establish how integrated communication management systems influence and examine the influence of e-time tracking performance of real estate projects in Nairobi County. The study adopted descriptive survey method. Pearson correlation was used to establish the association between the independent variables and the dependent variable and it was found that e-cost tracking, e-quality assurance, integrated communication management systems and e-time tracking have a significant association with performance of real estate projects in Nairobi County. Multiple regression was used to answer research questions.

5.2.1 E-cost tracking

The first objective of the study was to establish how e-cost tracking influences performance of real estate projects in Nairobi County. Descriptive results showed that majority of respondents agreed that e-cost tracking influences performance of real estate projects. Correlation analysis showed there was a significant positive association between e-cost tracking and performance of real estate projects. Regression coefficient results revealed that e-cost tracking and performance of real estate projects in Nairobi County have a positive and significant relationship. E-cost tracking was found to be satisfactory in explaining performance of real estate projects.

5.2.2 E-quality assurance

The second objective of the study was to determine how e-quality assurance influences performance of real estate projects in Nairobi County. Descriptive results showed that majority of respondents agreed that e-quality assurance influences performance of real estate projects. Correlation analysis showed there was a significant positive association between e-quality assurance and performance of real estate projects. Regression coefficient results revealed e-quality assurance and performance of real estate projects in Nairobi County have a positive and significant relationship. E-quality assurance was found to be satisfactory in explaining performance of real estate projects.

5.2.3 Integrated communication management systems

The third objective of the study was to establish how integrated communication management systems influences performance of real estate projects in Nairobi County. Descriptive results showed that majority of respondents agreed that integrated communication management systems influences performance of real estate projects. Correlation analysis showed there is a significant positive association between integrated communication management systems and performance of real estate projects. Regression coefficient results revealed integrated communication management systems and performance of real estate projects in Nairobi County have a positive and significant relationship. Integrated communication management system was found to be satisfactory in explaining performance of real estate projects.

5.2.4 E-time tracking

The fourth objective of the study was to examine the influence of e-time tracking on performance of real estate projects in Nairobi County. Descriptive results showed that majority of respondents agreed that e-time tracking influences performance of real estate projects. Correlation analysis showed there is a significant positive association between e-time tracking and performance of real estate projects. Regression coefficient results revealed e-time tracking and performance of real estate projects in Nairobi County have a positive and significant relationship. E-time tracking was found to be satisfactory in explaining performance of real estate projects.

5.3 Conclusion

The conclusions of this study were informed based on the findings of the study. Each objective was reviewed and a conclusion provided that covers theory and practice. The purpose of this study was to establish influence of e-monitoring and evaluation on performance of real estate projects in Nairobi City County. Based on research finding it can be concluded that e-cost tracking influences the performance of real estate projects. The task for the cost tracking is to monitor expenses on real estate projects for the management and funders who need accurate, detailed and frequent cost information for making decisions. Cost tracking identifies, collects, measures, classifies, and reports information that is useful to managers for determining the cost overruns for planning, controlling, making continuous improvements and decision making. The goal of cost tracking is to ensure that the project is executed in a cost efficient, profitable manner, according to business goals and from the perspective of the entire company.

It is also concluded e-quality assurance significantly influences on performance of real estate projects. Paying close attention to the quality of projects being undertaken by the real estate firm is critical in enhancing customer acceptability promoting the overall project performance. Clients that receive quality real estate projects will recommend the construction company to other clients who will request for the same project. Effectiveness in quality monitoring leads to the establishment of quality projects. Quality, therefore, must be recognized, from the point of importance, at the same level as the scope of the project, time and costs.

Based on research finding it can also be concluded that integrated communication management systems, influences performance of real estate projects. The importance of integrated communication management in the success of a project is immense. Careful communication planning and setting the right expectations with all the project stakeholders is extremely important. Integrated communication management allows project team to establish the team dynamics and learning the project expectations are the keys to success when starting a project. Project Communications Management includes the process required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. Inefficient communication management system when undertaking real estate projects is a major cause of failures associated with construction projects. The role of integrated communication

management in construction projects cannot be over emphasized as the management in the construction industry must communicate effectively in any given project for it to be successful. As the project unfolds and the design is realized, information in the form of drawings, specifications and construction methods must be communicated from one section of the management to another. Communication poorly managed will lead to design errors and slowdown in the entire project progress and failure in project performance. Therefore, using an appropriate communication management system to resolve construction and design problems is essential.

Finally, it can be concluded that e-time tracking influences performance of real estate projects. Time tracking is important in any construction project. Without proper time tracking, many problems will occur such as extension of time or time overrun. E-time tracking have proven to be an efficient approach, which would help owners and contractors in the real estate industry in upgrading their management capabilities and enable them to efficiently complete the construction projects and attain development goals. Lack of subcontractor's knowledge and awareness of the importance of project time management tools and techniques are still major obstacles toward the efficient project management process in real estate industry.

5.4 Recommendations

Based on the results of the findings and the conclusions drawn from the study, the various recommendations for the management were made. The recommendations are based on the study findings of the study. The study benefits real estate firms and other construction related companies.

1. The study recommends for the adoption of e-cost tracking to techniques to monitor cost expenses to the real estate company. Effective cost tracking will minimize cost overruns and project delays that reduce the profitability margin of the real estate company. Cost tracking is applied throughout the project life cycle to avoid poor cost performance and overrun of cost. Cost tracking helps in keeping the project within its defined budget. Achieving project completion within the estimated cost is fundamental criteria for success of any project. Hence cost tracking is very important consideration for ensuring project performance.
2. The study recommends for the adherence to quality standards of real estate projects during development. There is need to employ electronic quality monitoring tools to improve of the quality of real estate projects. The quality of some buildings in Nairobi City County has been of poor

quality as indicated by frequent collapse of these buildings. The real estate management has the final responsibility in project quality monitoring, and quality assurance has the equal priority with costs and the time plan of the project performance. There should be policies that guide the quality assurance process. The policy should define the goals of quality, level of qualitative acceptability for the real estate company and the responsibility of the management in ensuring quality assurance of projects.

3. An integrated communication management system is required to link various facets of the organization. The role of effective communication in any project management organization is extremely important. Recognised as a key element in the Project Management Board of Knowledge, project communications management provides the critical links between and among people, ideas, and information that are vital for project success. Good communications are also vital to the success of the project and to effective control of cost, time and quality. Integrated communication management system will link real estate management, staff, stakeholders, material suppliers, clients and regulatory bodies in a manner that information flow is effective and efficient to allow timely decision making in the company. Integrated communication management in the real estate sector allows simultaneous running of various activities that need to be coordinated well. During certain stages, some phases may very often be undertaken simultaneously; requiring major efforts in terms of the coordination and communication between the participants. Integrated communication management has also been linked to team effectiveness, the integration of work units across organizational levels, characteristics of effective supervision and overall project performance.

4. The study recommends the implementation of e-time tracking systems to check project progress against time. The techniques include Gantt charts, Critical path methodology and Program Review Evaluation technique. The appropriateness of e-time tracking can be seen as a relevant indicator that could be used to assess contractors' effectiveness and capability to succeed on the completion of a project and to evaluate contractors' performance. However, monitoring project time is one of the many challenges for the project manager. Time monitoring seeks to assess how well the project adheres to the planned schedule over a period of time. Real estate projects should be monitored and evaluated as planned and scheduled frequently. This allows for sufficient and informed

decision-making processes. This also reduces wastage of resources and time since corrective measures can be applied to where there are hitches in project implementation. Project firms with mature time management practices produce successful projects than those with less mature time management practices.

5.5 Suggestions for Further Research

This study focused on e-monitoring and evaluation as a determinant of project performance in the real estate sector. There are other factors influences project performances in the real estate sector. The factors include project planning, funding, leadership support and technical competence. Further research may include these factors when studying the performance of real estate projects.

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Appendix 2: Questionnaire

This questionnaire is aimed at collecting data on the influence of e-monitoring and evaluation on performance of real estate projects in Nairobi County, Kenya for a Master's Degree project. The data was used for academic purpose only and was treated with strict confidence. Respondents participated in the study by providing answers to the items in the sections as indicated.

INSTRUCTIONS

Kindly fill your response in the space provided or tick (√) as appropriate. All the information provided here were considered private and confidential for the purpose of this research ONLY.

SECTION A: DEMOGRAPHIC INFORMATION

1. What is your gender? (tick) Male [] Female []

2. What is your age?
 Below 30 years [] 31 – 40 years []
 41– 50 years [] Over 51 years []

3. What is your level of education
 Diploma [] Undergraduate []
 Post graduate []

4. How long have you been working running the firm?
 Less than 5 years [] 5 - 10 years []
 11 - 15 years [] More than 15 years []

5. Has your firm adopted technology in monitoring and evaluation?
 Yes [] No []

6. Section B: e-cost tracking and performance

In the Table below, please indicate your appropriate response to the statements given by ticking in the correct box (√). Key: Strongly Disagree – 1, Disagree – 2, Don't know – 3, Agree – 4 and Strongly Agree – 5.

| No | Statement | Strongly disagree | Disagree | Don't know | Agree | Strongly agree |
|----|---|-------------------|----------|------------|-------|----------------|
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | Planning and performance monitoring in government have been predominantly characterized by a silo approach | | | | | |
| 2 | Planning and performance monitoring in government has resulted in a situation where planning, budgeting, and reporting and monitoring and evaluation functions are done by different sections in institutions in isolation of each other. | | | | | |
| 3 | Challenges of performance monitoring in government include the lack of accountability, particularly for monitoring and reporting on performance information, unrealistic target setting and poor quality of performance information. | | | | | |
| 4 | Monitoring and evaluation budget should be about 5 to 10 percent of the entire budget, | | | | | |
| 5 | The project budget should provide a clear and adequate provision for monitoring and evaluation events. | | | | | |
| 6 | Monitoring and evaluation budget can be obviously delineated within the overall project budget to give the monitoring and evaluation function the due recognition it plays in project running, | | | | | |

7. Section C: e-Quality tracking and performance

In the Table below, please indicate your appropriate response to the statements given by ticking in the correct box (√). Key: Strongly Disagree – 1, Disagree – 2, Don't know – 3, Agree – 4 and Strongly Agree – 5.

| No | Statement | Strongly disagree | Disagree | Don't know | Agree | Strongly agree |
|----|---|-------------------|----------|------------|-------|----------------|
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | Thorough checklists is done before kick start of project | | | | | |
| 2 | There is need to conduct failure testing for quality monitoring | | | | | |
| 3 | Adopting right software to check quality control I required | | | | | |
| 4 | Baseline surveys determine quality state of the project | | | | | |

8. Section D: e-Time tracking and performance

In the Table below, please indicate your appropriate response to the statements given by ticking in the correct box (√). Key: Strongly Disagree – 1, Disagree – 2, Don't know – 3, Agree – 4 and Strongly Agree – 5.

| No | Statement | Strongly disagree | Disagree | Don't know | Agree | Strongly agree |
|----|---|-------------------|----------|------------|-------|----------------|
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | Monitoring gives information on where a policy, program, or project is at any given time (and over time) relative to respective targets and outcomes. | | | | | |
| 2 | Evaluation gives evidence of why targets and outcomes are or are not being achieved. | | | | | |

| No | Statement | Strongly disagree | Disagree | Don't know | Agree | Strongly agree |
|----|--|-------------------|----------|------------|-------|----------------|
| | | 1 | 2 | 3 | 4 | 5 |
| 3 | Evaluation is a complement to monitoring in that when a monitoring system sends signals that the efforts are going off track (for example, that the target population is not making use of the services, that costs are accelerating, that there is real resistance to adopting an innovation, and so forth), then good evaluative information can help clarify the realities and trends noted with the monitoring system. | | | | | |
| 4 | An M&E system should be regarded as a long-term effort, as opposed to an episodic effort for a short period or for the duration of a specific project, program, or policy | | | | | |
| 5 | Sustaining such systems within governments or organizations recognizes the long term process involved in ensuring utility (for without utility, there is no logic for having such a system). | | | | | |

9. Section E: Integrated communication management system

In the Table below, please indicate your appropriate response to the statements given by ticking in the correct box (√). Key: Strongly Disagree – 1, Disagree – 2, Don’t know – 3, Agree – 4 and Strongly Agree – 5.

| No | Statement | Strongly disagree | Disagree | Don't know | Agree | Strongly agree |
|----|---|-------------------|----------|------------|-------|----------------|
| | | 1 | 2 | 3 | 4 | 5 |
| 1 | Use of information systems influence project quality/output | | | | | |
| 2 | Information Systems improve Project Information Accessibility | | | | | |
| 3 | Information Systems improve project timelines | | | | | |
| 4 | Information technology is needed when communicating with stakeholders | | | | | |
| 5 | Information technology is needed when Communication with employees | | | | | |
| 6 | Information technology is needed when Communication with financiers | | | | | |

10. Section F: Performance of Real estate Projects

In the Table below rate performance of real estate projects in terms of indicators provided, please indicate your appropriate response to the statements given by ticking in the correct box (√).

Kindly indicate the number of successfully implemented project within the **Time frame** in the last five years.

| | | Projects | | | | |
|------|--------------|-----------------|--------|---------|----------|---------|
| | Years | 1 to 3 | 4 to 6 | 7 to 10 | 11 to 13 | Over 14 |
| 11.1 | 2014 | | | | | |
| 11.2 | 2015 | | | | | |
| 11.3 | 2016 | | | | | |
| 11.4 | 2017 | | | | | |
| 11.5 | 2018 | | | | | |

12 How much was the project variation cost of the actual from the budgeted?

| | | Cost | | | | |
|------|-------------|-------------------------|------------------------|----------------------|---------------------|--------------------|
| | Year | Less than Ksh 1,000,000 | Ksh2,000,000-5,000,000 | 5,001,000-10 million | 10million-20million | Over Ksh 20Million |
| 12.1 | 2014 | | | | | |
| 12.2 | 2015 | | | | | |
| 12.3 | 2016 | | | | | |
| 12.4 | 2017 | | | | | |
| 12.5 | 2018 | | | | | |

20. Kindly rate the percentage Quality of projects implemented in the last five years.

| | | Percentage % | | | | |
|------|-------------|---------------------|-----------|-----------|-----------|----------|
| | Year | 0 to 20 % | 21 to 40% | 41 to 60% | 61 to 80% | Over 81% |
| 18.1 | 2014 | | | | | |
| 18.2 | 2015 | | | | | |
| 18.3 | 2016 | | | | | |
| 18.4 | 2017 | | | | | |
| 18.5 | 2018 | | | | | |