

**FACTORS INFLUENCING IMPLEMENTATION OF
TELECOMMUNICATION NETWORK EQUIPMENT PROJECTS
IN KENYA: A CASE OF SAFARICOM LIMITED**

BY

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the Award of the Degree of Master of Arts in Project Planning and Management,
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DECLARATION

This research project report is my original work and has not been presented for the award of a degree in any other University.

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This research project report has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This research report is dedicated to my father John Mukopi and my mother Violet Mukopi whose support was invaluable. Without their assistance I wouldn't be where I am today and I deeply appreciate their help.

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ABBREVIATIONS AND ACRONYMS

ATM	Asynchronous Transfer Mode
CSF	Critical Success Factor
DSL	Direct Subscriber Line
G.O.K	Government of Kenya
ITU	International Telecommunications Union
LTE	Long – Term evolution
NPS	National Police Service
PIP	Project Implementation Profile
PM	Project Manager
PMBOK	Project Management Body of Knowledge
PRINCE 2	Projects in Controlled Environments
RFP	Request for Proposal
SPSS	Statistical Package for Social Science
TKL	Telkom Kenya Limited

ABSTRACT

As telecom operators around the world continue to upgrade their network technologies to improve performance and increase capacity, many of them are confronted with the challenge of how to best implement these projects. Many projects around the world keep failing, resulting in loss of millions of dollars for organizations. This persisting challenge has led to this study being undertaken so as to attempt to identify the influencing factors that need to be tackled head on during implementation of telecommunication network equipment projects. The objectives of the study were to establish how project scope management influences implementation of telecommunication network equipment projects, to determine how project time management influences implementation of telecommunication network equipment projects, to examine how project cost management influences implementation of telecommunication network equipment projects, to establish how project procurement management influences implementation of telecommunication network equipment projects and to determine how project communication management influences implementation of telecommunication network equipment projects. The study used a descriptive survey design which enabled the researcher to get both internal and external insights into the study. Questionnaires were used as instruments of data collection. The population of the study consisted Safaricom Limited employees working in the project management, network roll out, procurement, transmission and legal departments implementing telecommunication projects in Nairobi. From a target population of 45 respondents, a total of 40 respondents were purposely sampled. A response rate of 92.5% was obtained. The Data was analyzed through SPSS version 20 and AMOS version 21 and presented in the form of frequency tables. The findings of the study indicated that project scope management, time management, scope management, procurement management and communications management do influence the implementation of telecommunication network equipment projects in the organization. It also emerged that top management support and having skilled labor is necessary when implementation of such projects. The study concluded that project integration, risk management, human resource management and quality management can as well influence the implementation of telecommunication network equipment projects according to the goals and objectives of the specific project. The study recommends that the management should invest in project integration management so as to ensure that the various elements of the project are properly coordinated. This study also recommends the need for the organization to put active efforts to develop project management skills and techniques of its employees within the organization. The study also recommends a fresh set of eyes in the communication process to help the organization identify risks and potential mistakes.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter entails the background to the study with regard to implementation of telecommunication network equipment projects, the statement of the problem, objectives of the study, research questions, significance of the study, assumptions of the study, limitations of the study and definition of significant terms used in the study.

1.2 Background to the Study

The process of project implementation, involving the successful development and introduction of projects in the organization, presents an ongoing challenge for managers. According to Slevin (1987), the project implementation process is complex, usually requiring simultaneous attention to a wide variety of human, budgetary, and technical variables. As a result, the organizational project manager involved in implementation of telecommunication network equipment is faced with a difficult job characterized by role overload, frenetic activity, fragmentation, and superficiality. Consequently, the project manager would be well served by more information about those specific factors critical to project success. The project manager requires the necessary tools to help him or her focus attention on important areas and set differential priorities across different project elements. If it can be demonstrated that a set of factors under the project manager's control can have a significant impact on project implementation success, the project manager will be better able to effectively deal with the many demands created by his job, channeling his energy more efficiently in attempting to successfully implement the project under development.

Almost everyone is familiar with projects perceived as successful by those involved in their implementation, while the very same projects have been poorly received by customers (Pinto & Slevin 1988). There are other projects that consumed excessive resources and were considered internal failures, but were later hailed as successful by

their customers and become a source of revenue for the company for many years (De Wit, 1986). Safaricom Limited is involved in implementation of major telecommunication network equipment projects and as they continue to upgrade their network technologies to improve performance and increase capacity, many of them are confronted with the challenge of how to best implement these projects. According to Desmond (2003) the key process areas which are important to the successful implementation of telecommunication network equipment projects are; integration, project scope management, time management, cost management, procurement, risk management, communications management, human resources management and quality management. Driven by the complexity and cost of maintaining multiple technologies, as well as the need to make valuable assets occupied by older and less efficient technology available for reuse, operators have begun to prepare for the decommissioning of their older networks. Price Waterhouse Coopers (2015). According to the International Telecommunications Union (ITU) more than 2.2 billion people, or 32% of the global population, now use the internet, while over 6 billion people, over 87% of the world, hold subscriptions for mobile services.

Furthermore, subscriptions for advanced services such as 3G mobile data are growing at 37% annually, accelerating the construction of new wireless networks and high speed wire line networks that carry wireless traffic to its ultimate destination. International Telecommunications Union (2015). Project management in its present state is a highly structured process. It involves initiating, planning, execution, monitoring, controlling and completing a plan or project as specified. It involves expertise in estimating costs and resources, procurement of resources and supplies, organizing teams and workloads, directing and assigning roles, status reporting to upper management, risk assessment, time management and communication at all levels. However, identifying those factors that can make a project succeed is difficult and cumbersome. Meyer (2015).

Erling *et al.* (2006) stated that there is no clear proof linking a project success factor and actual project success. Again, different industry sectors have their own perception of success and failure, and what factors can contribute to either. Therefore, the study is set

to identify those factors that influence implementation of telecommunication network equipment projects in Kenya, using Safaricom Limited.

1.3 Statement of the Problem

Many projects around the world keep failing, resulting in loss of millions of dollar for organizations. This persisting challenge has led many project management professionals to attempt to identify the influencing factors that need to be tackled head-on to produce a successful project management outcome. Mortensen (2013). The telecommunications industry is in a state of transformation and becoming ever more complex. Fast changes in the communication landscape, resulting from technological change and the development of new services, are affecting the core business of telecommunication operators. The industry is to refocus on emerging higher value-added services, which often require significant investment in new network technologies, and balancing this against shareholders' focus on shorter-term performance. There exist literatures on critical success factors for specific organizational operational units, or specific country situation, and very little empirical research on influencing factors for specific industry sectors, like for telecommunication industry projects. The study intends to carry out preliminary research on identifying the influencing factors that need to be managed carefully during implementation of telecommunication network equipment projects at Safaricom Limited Kenya.

1.4 Purpose of the Study

The purpose of this study was to establish factors influencing implementation of telecommunication network equipment projects at Safaricom Kenya Limited.

1.5 Objectives of the study

The objectives of the study were:

1. To establish how project scope management influences the implementation of telecommunication network equipment projects at Safaricom Limited.
2. To determine how project time management influences the implementation of telecommunication network equipment projects at Safaricom Limited.
3. To examine how project cost management influences the implementation of telecommunication network equipment projects at Safaricom Limited.
4. To establish how project procurement management influences the implementation of telecommunication network equipment projects at Safaricom Limited.
5. To determine how project communication management influences the implementation of telecommunication network equipment projects at Safaricom limited.

1.6 Research Questions

The study sought to answer the following questions.

1. How does project scope management influence the implementation of telecommunication network equipment projects at Safaricom Limited?
2. How does project time management influence the implementation of telecommunication network equipment projects at Safaricom Limited?
3. To what extent does cost management influence the implementation of telecommunication network equipment projects at Safaricom Limited?
4. How does project procurement management influence the implementation of telecommunication network equipment projects at Safaricom Limited?
5. How does project communication management influence the implementation of telecommunication network equipment projects at Safaricom limited?

1.7 Significance of the Study

This study sought to find out the factors that influence implementation of telecommunication network equipment projects. Competition is present in most segments of the telecommunications sector as a result of the country's open market-based licensing process instituted in 2008, though Safaricom still dominates mobile phone services with nearly 68 percent of the market as of September 2011. McLeod (2011). There might be new entrants into the telecommunication industry, either as individuals or institutions implementing telecommunication network equipment projects. From this study the findings may prove to be useful to project managers who want to implement telecommunication network equipment projects and it may be also be useful to new market entrants into the telecommunication industry who can use the research findings as a benchmark when trying to implement the same kind of projects. Erling *et al.* (2006) stated that there is no clear proof linking a project success factor and actual project success. Again, different industry sectors have their own perception of success and failure, and what factors can contribute to either. Therefore, the study will significantly improve on the knowledge that exists on telecommunication network equipment projects in Kenya.

1.8 Assumptions of the Study

The assumptions made in the study were that the sample will represent the whole population and the data collection instruments were valid as well as the measurements being accurate. Another assumption was that the respondents will answer accurately and truthfully when filling out the questionnaires.

1.9 Limitations of the Study

Suspicion by the project staff can be a challenge in that they might think the researcher is out to expose their weaknesses; in this regard they did undergo some sensitization regarding the purpose of the study. The data was collected from project staff that are usually busy or unavailable at their offices due to the nature of their work. To counter this

challenge some of the questionnaires were administered and picked up later. Prior arrangements to deliver and pick questionnaires were made to ensure the respondents were met at their convenience.

1.10 Delimitations of the study

The study delimited itself by concentrating on the factors influencing implementation of telecommunication network equipment projects at Safaricom limited. The research targeted top managers, middle level managers and junior staff involved in implementation of telecommunication network projects. The researcher used a consent form seeking the acceptance or rejection of the respondents to participate in the study and this assured the respondents of their voluntarism in participation in the research. Additionally, the researcher used informal interviews in order to find out what people thought and how the view of one individual compared with that of another. The data collected and the findings together with the solutions recommended will prove vital in the provision of long lasting solutions and will be available for use by other telecommunication providers in future.

1.11 Definitions of Significant Terms Used in the Study

Communications management	This is a subset of project management that includes the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information.
Cost management	This is a subset of project management that includes processes required to ensure that the project is completed within the approved budget.
Implementation	This simply means carrying out the activities described in your work plan. It is the phase where visions and plans become reality.

Procurement management

This is a subset of project management that includes the processes required to acquire goods and services to attain project scope from outside the performing organization.

Scope management

This is a subset of project management that includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.

Network equipment

These are physical devices which are required for communication and interaction between devices on a computer network. Specifically, they mediate data in a computer network. This includes mobile devices and base stations, PBX equipment for contact centers and even IP telephony, as well as traditional and enterprise networking equipment for LAN and WAN.

Telecommunication

This is the transmission of signs, signals, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems, as defined by the International Telecommunication Union (ITU).

Time Management

This is a subset of project management that includes the processes required to ensure timely completion of the project.

1.11 Organization of the Study

Chapter one discusses the background of the study in relation to the factors influencing implementation of telecommunication network equipment projects. It projects context by giving a deeper description on current global trends. The statement of the problem and the purpose of the study follow and culminates into the main objectives of the study with corresponding research questions. The significance of the study, assumptions of the study, limitations and delimitations of the study follow and the chapter ends with the definition of significant terms used in the study.

Chapter two of the study examines the existing body of knowledge to create a logical association between the identified variables and establish the probable gaps in knowledge. The chapter as well presents the theoretical background of the study. The conceptual framework has been illustrated diagrammatically to show the relationship between the independent variable and the dependent variables. A summary of the knowledge gaps as obtained from the empirical literature will also be clearly shown.

Chapter three covers the research methodology as applied in the study, the philosophical orientation, research design, target population, sampling procedure, description of research instruments, validity and reliability of research instruments, methods of data collection, procedures for data analysis, operational definition of variables and ethical considerations.

Chapter four presents the analysis of the data and its interpretation. The analyzed data is presented in tables that show the varying trends of the responses. Further the chapter makes an interpretation of the findings in the write up prepared to explain the tables.

Chapter five is the final chapter for the report. It describes the summary of findings and this is further done in tabular form with regard to objectives of the study. The main findings are discussed at length with linkage made with the past underlying theories. The chapter ends with conclusions of the study and suggest possible recommendations for the study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter will systematically identify, locate, and analyze empirical and theoretical information relating to the factors influencing implementation of telecommunication network equipment projects. This chapter reviews related literature with respect to the research objectives and also discusses the conceptual framework and the gaps in knowledge in the study.

2.2 The Concept of Implementation of Telecommunication Network Equipment Projects

According to Desmond (2003) the key process areas which are important to the successful implementation of telecommunication network equipment projects are; integration, project scope management, time management, cost management, procurement, risk management, communications management, human resources management and quality management. According to Sherif (2006b) Projects to establish or run telecommunication services are multidisciplinary and cross-functional. Implementation of telecommunication services involves several engineering disciplines (construction, physical design, mechanical, thermal, electrical, computer science, etc.) in addition to statisticians, marketing and legal professionals, etc. The operation and maintenance of the network require administrative skills for accounting, logistics, human resource management, etc. Many of these aspects are intertwined due to regulations as well as the nature of the various technologies used. For example, the construction of buildings and the installation of antennas must be fire - and earthquake - resistant. Environmental regulations control the placement of transmission towers to protect the population from radiation, while the installation of satellite antennas must take into account resistance to wind. Cables must be rodent-resistant. There are also other legal obligations in procurement and contract management or the use of frequency bands, etc.

Wireless transmissions have to meet specific health laws as well as aesthetic standards. When different classes of service are offered to meet some marketing goals, this could translate into different types of licenses, each of which is subject to different laws and regulations for individual countries. Thus, in telecommunication services, risk analysis call upon a combination of engineering, financial and legal expertise.

A case example is the Kshs. 15 billion public safety security project between the Kenyan government and Safaricom Limited signed in June 2014, which included installation of cameras in the two cities to provide real-time footage to the National Police Operations Centre and in the same breathe enable law enforcement officers effectively coordinate and deploy their resources in response to threats to national security and, indeed, emergency situations requiring the interplay of competencies from the National Police Service and various disaster response teams.

The project has seen the connection of 195 police stations in Nairobi and Mombasa to 4G networks in a bid to ease communication. This is following multiple attacks experienced in the two cities over the last one year with speculations of the two cities being possible hubs of terrorists. The project meant to enhance security in the country by providing security agents with the capability to monitor and deter crime got a go-ahead by the government after Safaricom Limited underwent intense scrutiny by National Assembly and Public Procurement Oversight Authority. The government will enjoy the use of the service at no cost for the first year of its operation after which it will pay for the solution through a series of annual installments starting 2016.

The project will run on the latest LTE Push to Talk standard for public safety systems that uses the lower frequency bands assigned to security services. It will be a standalone independent IP network with multiple redundancies that will deliver high speed video, voice and data a wide ranging number of secure devices. The police officers will also be equipped with track-able walkie-talkies that will make it easy to locate officers closest to a crime scene for fast response. This will be backed up by a command and control redundancy center capable of coordinating emergency response. After the expiry of the final agreed contact period, the infrastructure will belong to the National Police Service on a build, operate and transfer model. To validate that, an open book accounting method

will be used to ensure that the customer has full visibility of all costs. Essentially the project was geared at improving communication between various State agencies that oversee and provide security to Kenya and Safaricom's role was only to design, construct and support a robust communications network, managed centrally by the National Police Service (NPS). As a contractor, Safaricom's scope included the design and construction of the network. Once the network was up and running, the management of the system was to be handed over to the National Police Service.

2.3 Project Scope Management and Implementation of Telecommunication Network Equipment Projects

Scope management is the function of controlling a project in terms of its goals and objectives through the processes of conceptual development, full definition, execution, and termination. It provides the foundation upon which all project work is based and is, therefore, the culmination of predevelopment planning. The process of scope management consists of several distinct activities, all based on creating a systematic set of plans for the upcoming project Pinto (2013). According to the PMBOK. Guide the processes related to scope management are:

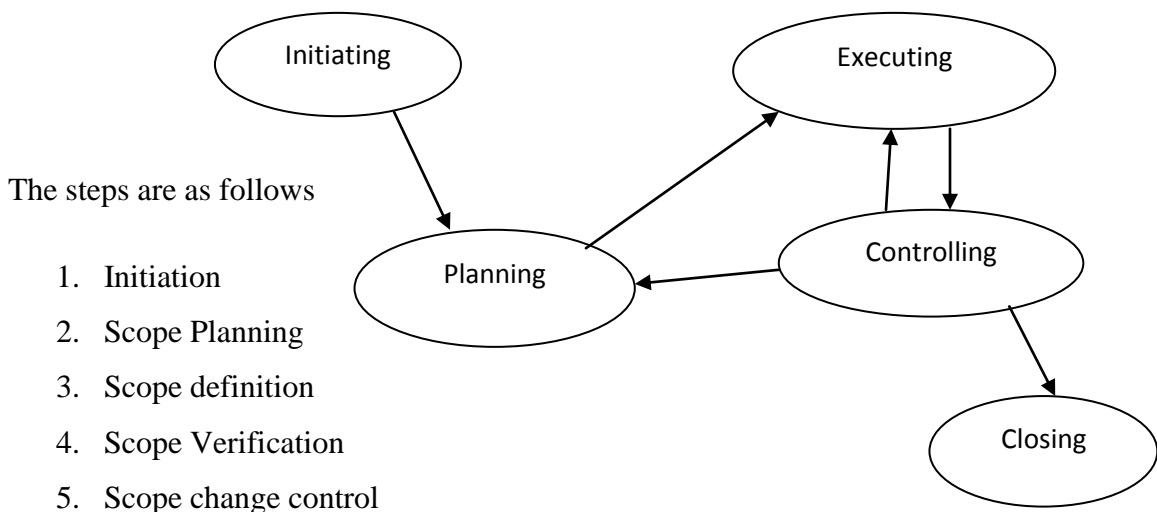


Figure 1: The Scope Process

Project scope management concerns the project and includes all the work required, and only the work required, to complete the project successfully. It defines exactly what is and what is not included in the project scope e.g. key outputs and deliverables expected by the customer. It is very difficult to create an adequate project scope and minimize scope changes during the project. At the end of a project its scope is measured against the planned requirements. Therefore, all actions of the project must be well integrated to ensure the delivery of the predefined project specifications. Project scope can be seen as the fundamental basis for project planning and execution. Without clarity of scope, projects can encounter a large number of difficulties including scope creep, lack of support, inability to satisfy customer needs, inability to reach conclusion and the like. To manage these possibilities of failure it is necessary to install change control management. Change control processes include the implementation of changes within other management processes (e.g. time control, cost control, quality control, etc.). to consider all those factors it is necessary to have a detailed process plan to implement scope change control correctly. Olaf (2009). Project scope management ensures that project stakeholders have the same understanding of what products the project will produce (Schwalbe, 2011). Furthermore, Schwalbe (2011) states that scope definition and scope verification are some of the processes used in project scope management.

2.4 Project Time Management and Implementation of Telecommunication Network Equipment Projects

According to the PMBOK GUIDE (2000). Project time management includes the processes required to ensure timely completion of the project. The PMBOK Guide dedicates one of ten Knowledge Areas to Project Time Management, which includes the processes required to accomplish timely completion of the project . This knowledge area includes processes such as Activity Definition, Activity Sequencing, Activity Resource Estimating, Activity Duration Estimating, Schedule Development, and Schedule Control. The appropriateness of Project Time Management 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. Rómel G. Solís-Carcaño et al. (2009)

These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals, based on the needs of the project. Each process generally occurs at least once in every project phase. On some projects, especially ones of a smaller scope, activity sequencing, activity duration estimating, and schedule development are so tightly linked that they are viewed as a single process that can be performed by a person over a relatively short period of time.

In any one project, there will be many parties with a legitimate interest in ensuring that the timing of the work is managed effectively. The purpose of the time - model is to indicate when in the future and in what sequence the planned work is to be performed, so that the intended work and the consequences of any changes, or departures from that intention can be predicted, communicated and managed efficiently. Because, at any one time, the time - model can only be as accurate a prediction of the future as current knowledge will allow, it must be conceived as a model which can be improved upon as information becomes available or circumstances change. In order to facilitate efficient time management, the time - model should be constructed so as to differentiate between work that can be predicted.

The employer and its professional team are entitled to know what the contractor has achieved to date, and whether it is on target to complete by the various key dates and contract completion date. The working schedule is thus not just the schedule of the contractor's intentions, but a fundamental management tool for the employer and the design team as it provides the essential information regarding the timing and interface of their continuing obligations and the calculating mechanism in the event that the contractor becomes entitled to an adjustment of the time to complete. Chartered Institute of Building (2010).

2.5 Project Cost Management and Implementation of Telecommunication network Equipment Projects

According to Thamhain (2014). Managers might feel pressured to provide optimistic time or cost estimates to influence project approval. However, inaccurate cost estimates will eventually lead to unrealistic project plans that cannot be executed within the established constraints. They are running the risk of feasibility reassessment, re-planning, or, worse, cancellation with dire consequences to all parties involved. Managers have a large number of methods available for estimating cost and resource requirements for their projects. According to PMBOK (2013), it is one of the three activities that need to be performed as part of the cost management function. However, in spite of the sophistication and variety of approaches and computer support, cost estimating is still an art, at least to some degree. Regardless of the level of estimating detail chosen, the process cannot be performed without a clear project definition at the level of the required estimate and a selection of the estimating method. The task for the cost management function is to produce information for internal users who need accurate, detailed and frequent economic information for making decisions (Belkanoui, 1993). Specifically, cost management “identifies, collects, measures, classifies, and reports information that is useful to managers for determining the costs of products, customers, and suppliers, and other relevant objects and for planning, controlling, making continuous improvements, and decision making” (Hansen & Mowen, 2006). Project cost management includes three major functions called cost estimating, budgeting and cost control (Project Management Institute [PMI], 2004). The goal of these functions is to “ensure that the project is executed in a cost efficient, profitable manner, according to business principles and from the perspective of the entire company” (Artto et al., 2011).

Managing a project’s cost starts early during the marketing and sales phase of the project when tentative cost estimates are created. During this phase, estimates are iteratively specified to provide accurate and reliable information to be used in tendering and pricing the delivery project. During the project specification phase, a tentative project budget is set, a specification-to-cost approach is exploited to ensure cost-effective specifications and, typically, the letters of intent with the main suppliers are signed. Before the

implementation phase, the project budget is created based on the latest cost estimates. In the project planning phase, the resources for the work tasks are allocated, cash flows are planned and typically cost contingencies are set. During the planning and implementation phases, the actual costs of the project are monitored. In addition, cost estimates and forecasts are constantly updated and then compared with the project budget. In the implementation phase, the project revenues are monitored, invoicing is performed and cost contingencies are released. In some projects, funding is also ensured during the implementation phase. After system delivery, the operating costs of the delivered system are monitored in co-operation with the customer, warranty costs are monitored and a learning loop back to the earlier phases should be created. Jaakko et al. (2014).

2.6 Project Procurement Management and Implementation of Telecommunication Network Equipment Projects

Many telecom projects require procurement of equipment or services from outside the company. Most service development projects involve some acquisition - perhaps purchasing ATM or DSL equipment or service components for wireless service. However, in most telecom companies of any size, the purchasing department is responsible for the procurement processes, and this department works closely with project teams. Depending on the organization structure selected for a specific project, the procurement person may actually report to the PM for the duration of the project, or may continue to work within the home department, contributing to the project from there. The project manager and project team also play an integral role in procurement, as they define what is required, produce the specs and handle the control. Desmond (2003). Project procurement management is more important to project management than most non-project managers realize. Project managers tend to work on one of two types of projects which are; internally funded or externally funded. A tiered arrangement is not uncommon in large complex projects with a customer, a supplier (often called the prime contractor) and component suppliers (often called subcontractors), each with a project manager looking after the interests of their employers. As part of this fiduciary responsibility, each project manager needs to understand and manage procurement from

both the buying side of obtaining services and equipment and from the selling side, in terms of preparing tenders or quotes to their particular customer.

When conducting procurement, a project manager is exposed to a number of potential sellers all of whom want the project manager's business. Conducting procurements involves releasing procurement documents to the market, collecting proposals, analyzing those proposals, evaluating them and selecting the preferred seller. Having selected a seller and negotiated a contract, the project manager needs to administer the contract, i.e. track progress, and ensure that what was requested is in fact delivered and that payments are made as appropriate. Often this is left to other parts of the organization to manage; however, it is the project and, thereby the project manager, who experiences any contract mismanagement impacts. As such, the project manager needs to be fully aware of contract progress. Levla Lafayette (2012). E-procurement has become one of the most successful applications of electronic commerce (e-commerce), having been implemented by many companies seeking better business processes (Aberdeen Group, 2001). Kalakota and Robinson (2000) have identified benefits in cost saving, improved efficiency, measurement and single data entry; consequently, these are the three catalysts driving growth in the e-procurement area. E-Procurement is the procedure that involves goods procurement automation by use of internet. This process leads to significant reduction in both cost and time. As noted by Quinnox (2012), e-procurement is a very comprehensive phenomenon which includes making strategic initiatives and it can be used in reorganizing the entire purchasing process. Implemented e-Procurement system can connect companies and their business processes directly with suppliers while managing all interactions.

2.7 Project Communication Management and Implementation of Telecommunication Network Equipment Projects

According to Boone (2000) communication has three main functions. The first one is to connect different people in and around the organization. Connecting can be via some media or direct face-to-face communication, but in order to communicate people need to be connected first. After people are connected, communication is about informing. The third important aspect of communication is to engage people. Engaging means that all parties are willing to share in the creation and implementation of ideas. Boone (2000). Projects are built around successful communication, not only technology as one might think in a high tech company. According to the studies more than a half of management problems in projects are more or less caused by poorly looked-after communication Ruuska (1996).

According to Ksenija (2010), project communication management is the knowledge area that employs the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information. Project communication is the responsibility of everyone on the project team. The project manager, however, is responsible to develop the project communication management plan. Planning communications is the process of determining the project stakeholder information needs and defining a communication approach. The process responds to the information and communications needs of the project stakeholders; for example, who needs what information, when they will need it, how it will be given to them, and by whom. While all projects share the need to communicate project information, the informational needs and methods of distribution vary widely. Identifying the information needs and determining a suitable means of meeting those needs are important factors for project success. Improper communication planning will lead to problems such as delay in message delivery, communication of sensitive information to the wrong audience, or lack of communication to some of the required stakeholders. A communication plan allows the project manager to document the approach to communicate most efficiently and effectively with stakeholders. Effective communication means that the information is

provided in the right format at the right time, and with the right impact. Efficient communication means providing only the information that is needed. The results of this planning process should be reviewed regularly throughout the project and revised as needed to ensure continued applicability.

Communication is a key element of project success in high technology product development projects. Communication is the link between cells, without it nothing would work. The project leader's management and communication skills need to be in good shape to have control over various stakeholders and keep the project running towards decent lead time and productivity. Communication has also an indirect influence in project financial performance through product concept effectiveness. Brown & Eisenhardt (1995). One of the key PM responsibilities is communications. In fact, the PMBOK GUIDE defines communications management as one of the process areas of project management. The four process areas are; communication planning, information distribution, performance reporting and administrative closure. Desmond (2003). The importance of communication and its strategic implications are expressed in Kamensky's strategic diamond. The success of a company in the long term can be broken down to 4 different elements: strategy, communication, competence and leadership. But none of these elements alone are enough to carry the company to prosperity, they are linked together. These four elements form the diamond of success and are all linked to the overall success of a company. Kamensky (2010).

2.8 Theoretical Framework

The research will be based on the "Ten Factor Model" developed by Slevin and Pinto (1987). The theoretical framework of a research project relates to the philosophical basis on which the research takes place, and forms the link between the theoretical aspects and practical components of the investigation undertaken. The theoretical framework, therefore, " has implications for every decision made in the research process" (Mertens, 1998, 3). Cohen et al. (2000), point out that 'model' is sometimes used instead of or interchangeably with 'theory'. A ten-factor model to successful project implementation

was developed by Slevin and Pinto (1987). These 10 factors form the basis for the diagnostic instrument for measuring relative strength of each factor of the project implementation profile (PIP).

Project information was obtained from a group of over 50 managers who had some project involvement within the last two years. Participants were asked to consider a successful project with which they had been involved and then to put themselves in the position of a project manager charged with the responsibility of successful project implementation. They were then asked to indicate things that they could do that would substantially help in implementation success. This procedure, sometimes called Project Echo, was developed by Alex Bavelas. Responses were then sorted into categories by two experts. Both experts sorted the responses into ten categories and inter-rater agreement based on percentage of responses similarly sorted across the total number was 0.50, or 119 out of 236. Eliminating duplications and miscellaneous responses, a total of 94 usable responses were classified across 10 factors. These 10 factors formed the basis for the conceptual model and the diagnostic instrument for measuring relative strength of each factor.

Table 2.1: Theoretical framework Factor Definitions

Factor	Factor Definitions
Project Mission	Clearly defined goals and general directions.
Top Management Support	Willingness of top management to provide the necessary resources and authority/power for project success
Project Schedule/ Plan	A detailed specification of the individual actions steps for. project implementation
Client Consultation	Communication, consultation, and active listening to all impacted parties.
Personnel	Recruitment, selection, and training of the necessary personnel for the project team
Technical Tasks	Availability of the required technology and expertise to accomplish the specific technical action steps
Client Acceptance	The act of "selling" the final project to its ultimate intended users
Monitoring and Feedback	Timely provision of comprehensive control information at each stage in the implementation process
Communication	The provision of an appropriate network and necessary data to all key actors in the project implementation
Troubleshooting	Ability to handle unexpected crises and deviations from plan

Project managers are continually assaulted with a wide variety of demands on time and resources. Because of the dynamic nature of most projects, it is becoming increasingly difficult for the project managers to keep adequate control over every aspect in the project which requires attention. The model has offered some suggestions to project managers who are intent on better understanding their projects' during its implementation process, but are at a loss as to how to go about attempting to more adequately ensure project success.

2.9 Conceptual Framework

The researcher has developed a conceptual framework for this study based on the review of literature. The study seeks to establish the relationship between five independent variables: Project scope management, Project time management, Project cost management, Project Procurement management and Project communication management with the dependable variable which is implementation of telecommunication network equipment projects. The moderating variables; top management support and skilled manpower which are a function of the independent variable help to explain the influence of the independent variables on the dependent variable. The interrelationships between the study variables are conceptualized as shown in Figure 2.

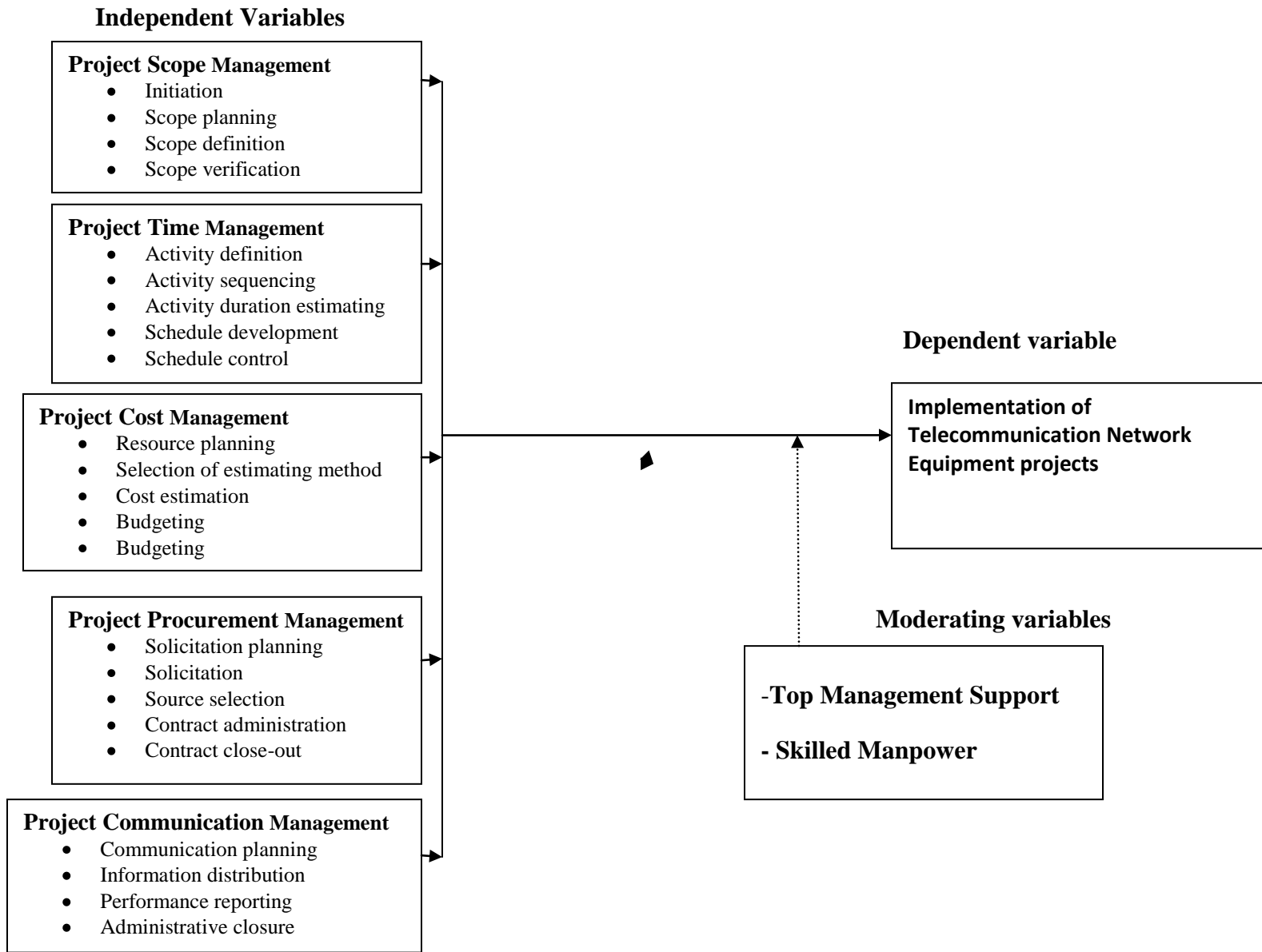


Figure 2: Conceptual Framework

2.10 Knowledge Gap

The research observed the gaps identified within the review of relevant literature as shown in the table below

Table 2.2: Summary of Gaps in Knowledge

Variable	Author and Year	Findings	Knowledge Gap
Scope management	Khalil et al. 2009 P. Newton, 2015	Scope management has influence on implementation of telecommunication network projects	The studies concentrated on scope management of general technology projects, instead of the influence of scope management in implementation of telecommunication network equipment projects
Time management	Longinus et al. 2013	Time management in projects influenced implementation of projects	The study concentrated on improving project management performance. There is need for a clearer explanation
Cost management	Mostafa, 2006 Strother, 2002 Dimarsico et al. 2002	Found positive relationships between cost management and implementation of projects	The studies concentrated on the billing charges and not how cost management influenced implementation of telecommunication network equipment projects
Procurement management	Sherif, 2006	Found positive relationships between project procurement management and implementation of telecommunication network equipment projects	Study concentrated on contract management. There is need to examine the influence of procurement management in network equipment projects.
Communication management	PMI , 2013 Culo, 2010	Findings were that communication management is critical and that a good communication process keeps stakeholders engaged and project teams motivated.	The studies did not show the influence of communication management in the implementation of telecommunication network equipment projects

2.11 Summary of Literature Review

This chapter is organized into ten sections. The first section introduces the topic. Section two discusses the concept of implementation of telecommunication network equipment projects. Section three to seven explores the objectives of the study in relation to implementation of telecommunication network equipment projects. Section eight explains the theoretical framework, section nine explains the conceptual framework while section ten explains the knowledge gap.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the research methods which were used in the study. The chapter covers research design, target population of the study, sample size and sampling techniques, data collection methods, pilot testing, validity and reliability of instruments, data collection procedure, data analysis methods, ethical considerations and the operational definition of variables that were used in this study.

3.2 Research Design

A descriptive survey design was used in the study. This type of design enabled the researcher to get both internal and external insights into the study and also helped to get more information that aided in the interpretation of the data. A descriptive study 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, (Cooper and Schindler, 2006).

A descriptive design study was an efficient method of collecting descriptive data that regard the characteristics of the population in order to gather information from the relative large cases by implying simple procedures and cutting down the case and maintaining reliability. Based on the findings the researcher will make conclusions and recommendations from the study.

3.3 Target Population

Target population in statistics is the specific population about which information is desired (Mugenda & Mugenda, 2004). The target population of interest of this study was drawn from 45 employees in the following five departments, project management, network rollout, procurement, transmission and contract management involved in the

implementation of telecommunication network equipment projects for Safaricom Limited.

3.4. Sample Size

So as to determine the sample size of the study two sample size calculation techniques were used. Stratified random technique as shown in table 3.1 and the Krejcie and Morgan table as shown in appendix 5.

Table 3.1: Calculation of Sample size

Department	No. of Employees	Strata size calculation	Sample size
Project Management	10	10x (40÷45)	9
Network Roll Out	10	10x (40÷45)	9
Procurement	9	9x (40÷45)	8
Transmission	9	9x (40÷45)	8
Contract Management	7	7x(40÷45)	6
Total	45		40

Sample size for each layer = size of layer x (size of whole sample/size of population).

3.5 Sampling Procedure

The study sampled 40 respondents. Samples of members of project management, procurement, transmission, network roll out and contract management departments of the three levels of management will be purposively sampled from Safaricom Limited staff involved in implementation of telecommunication network equipment projects.

3.6 Data Collection Methods

To collect the data from the respondents a number of data collecting techniques will be employed in this study. The researcher will submit questionnaires to be filled by the project management, procurement, transmission, network roll out and contract management officers of the three levels of management. The questionnaire is a primary data collection method (Kothari, 2004). The preference for a questionnaire will be based on the fact that respondents will be able to complete it without help, anonymously, and it will be cheaper and quicker than other methods while reaching out to larger sample (Robson, 2002).

3.6.1 Pilot Testing

According to Connelly (2008), extant literature suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. Depending on the instrument being used for the purpose of determining the effectiveness and validity of the instruments, the researcher conducted a participating pretesting with 4 respondents which was approximately 10% of the respondents as Kothari (2004) suggested. The four respondents were asked to fill four questionnaires and after the pretesting, some errors were noted such as wrong wording of questions, spelling mistakes, and use of unclear language and of lack of clarity of instructions were corrected. The respondents constituted of the project participants in the field site. This procedure checked for reliability and ethical appropriateness of the questionnaire guides which helped in revealing questions that might have been vague and allowed for their review until they conveyed the same meaning to all the subjects.

3.6.2 Validity of Instruments

Validity is defined as the accuracy and the meaningfulness of the inferences based on the research result (Mugenda and Mugenda 2002). This basically has to do with how accurate the data is. The researcher will use content validity in order to measure if the data collected will be valid. The researcher will identify the content that needs to be measured

in effective implementation of telecommunication network equipment projects through the use of professionals and experts in project management.

3.6.3 Reliability of Instruments

In order to ensure that the questions in the questionnaire were reliable a Cronbach's alpha test was run using (SPSS) version 20 to test for internal consistency. The alpha result was 0.888 which shows a good consistency in the data. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. However, there is actually no lower limit to the coefficient. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale as shown in table 3.2 below.

Table 3.2: Reliability of Instruments

Reliability Statistics	
Cronbach's Alpha	N of Items
.888	5

(See appendix 6 for details)

3.7 Data Collection Procedure

To collect data from respondents the researcher submitted questionnaires to be filled by officers involved in implementation of telecommunication network equipment projects at Safaricom LTD. The questionnaire is a primary data collection method (Kothari, 2004). The questionnaires contained both open ended and close ended questions that enabled the respondents to give their direct answers. It also allowed the respondents to leave out the questions that they were not able to answer. Open ended questions allowed the researcher to find out if the officers had a deeper and clear understanding in project management processes. The closed ended questions ensured the researcher captured particular variables in the study.

3.8 Data Analysis Techniques

Raw data collected from the field is usually unorganized. This data needs to be compiled and cleaned for potential errors. The researcher organized the data in order to analyze research questions. The next step involved questionnaire coding before being entered into a computer. Descriptive statistical analysis of quantitative data was made possible through computer software known as SPSS (Statistical Package for Social Sciences) version 20 and AMOS version 21 which were used to measure central tendencies and average of respondents. In addition, measures of dispersion were used. This enabled the researcher to draw conclusions on data variability using simple standard deviation. The qualitative data in the field was expressed in write ups so as to enrich the descriptive analysis in the quantitative methods. Stepwise multiple regressions was adopted for this study. Stepwise regression is based on the entry order of independent variables based on which variables contribute most to prediction at a given step in the regression equation.

Regression model for this study:

IMPLEMENTATION= $\alpha + \beta_1\text{scope} + \beta_2\text{time} + \beta_3 \text{ cost} + \beta_4\text{procurement} + \beta_5$
communication

3.9 Ethical Considerations

As an initial step to the research, the researcher obtained a transmittal letter from the University. In addition, the researcher assured anonymity and confidential treatment of responses to protect the credibility of the respondents.

3.10 Operation Definition of Variables

Table 3.3: Operational Definition of Variables

Research objective	Indicators	Data collection Tool	Measurement scale	Approach of analysis	Level of Analysis
Scope management	-Initiation -Scope planning -Scope definition -Scope verification	Survey	Nominal Ordinal	Qualitative Quantitative	Multiple Regression
Time management	-Activity definition -Activity sequencing -Activity estimating -Schedule development -Schedule control	Survey	Nominal Ordinal	Qualitative Quantitative	Multiple Regression
Cost management	-Project definition -Estimating method -Cost estimation -Budgeting	Survey	Nominal Ordinal	Qualitative Quantitative	Multiple Regression
Procurement management	-Soliciting planning -Solicitation -Source selection -Contract administration -Contract close-out	Survey	Nominal Ordinal	Qualitative Quantitative	Multiple Regression
Communication management	-Communication planning -Information distribution -Performance reporting -Administrative closure	Survey	Nominal Ordinal	Qualitative Quantitative	Multiple Regression

CHAPTER FOUR:

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter discusses the analysis of data, interpretation and the presentation of the research findings. The data was collected through questionnaires administered to the participants in the five selected departments which included; project management, network roll out, procurement, transmission and legal department.

4.2 Response Rate

The study shed light on the response rate the respondents and found out the information as documented in the Table.

Table 4.1: Response Rate

Department	Frequency	Percentage
Project management	9	48.6
Network roll out	9	21.6
Transmission	8	21.6
Procurement	6	16.2
Legal	5	13.5
Total	37	92.5

Out of the 40 questionnaires that were distributed to respondents in the five departments, a total of 37 (92.5%) were returned duly completed by the respondents. According to Mugenda and Mugenda (2003), a response rate of more than 50% would be ideal to represent the entire population of the research study while a response rate of 70% is very good. From the 37 respondents who were interviewed, most (48.6%) 9 each came from project management and network roll out department, transmission

department 8 (21.6%), Procurement department 6 (16.2%), and 5 respondents from the legal department represented (13.5%) of the respondents. The analysis was therefore based on these 37 questionnaires.

4.2.1 Distribution of Respondents in Terms of Personal Characteristics

This study sought to establish the distribution of respondents with regards to personal features and obtained the information detailed below.

4.2.2 Gender of the Respondents

This study sought to establish the distribution of the respondents in terms of gender with the results presented in Table:

Table 4.2: Distribution of Respondents by Gender

Gender	Frequency	Percentage
Male	23	62.2
Female	14	37.8
Total	37	100

As indicated this study found out that 62.2% of those interviewed were male while the remaining 37.8% were females. This clearly indicates that the majority of the stakeholders involved in implementation of telecommunication network equipment project work were in most cases men. The above can be explained by the arguments which have been advanced to the effect that in Kenya the females are still less able to effectively compete with males for entry into the public universities which are financially more affordable but also more difficult to enter due to the high cut-off entry points as a strategy to deal with the large applicant numbers. Consequently, many good females but below the public university cut-off points end up joining the less competitive private universities where qualification for admission and ability to pay are equally important. As

such, the students who want to do science-based courses, such as engineering and medicine, must pass well enough to secure places at the public universities and leave the arts based courses at the private universities to the women. According to Safaricom’s sustainability report 2015 the number of permanent male employees is 2,132 (51%) as compared to permanent female employees 2,060 (49%).

4.2.3 Distribution of Respondents in Terms of Age

The study also shed light on the distribution of the respondents in terms of age and found out the information as documented in the Table.

Table 4.3: Distribution of Respondents by Age

Age	Frequency	Percentage
Between 18 to 25 years	2	5.4
Between 26 to 40 years	32	86.5
Between 41 to 55 years	3	8.1
56 or older	0	0
Total	37	100

In terms of the age group, the study found out that up to 86.5% of those interviewed were aged between 26 to 40 years of age, 8.1% were between 41 to 55 years, 5.4% between 18 to 25 years while no one above 56 years was interviewed. According to Safaricom’s 2015 sustainability report, 70% of the workforce is in their 30’s, 16% are still in their 20’s, 13% between the age of 40-49 and 1% between 50-59 years. Safaricom being an integrated communications company providing voice, data and financial (mobile money) products and services to consumers, businesses and public sector clients it has invested heavily on hiring professional young and innovative employees who have the technical know how to cope in a modern business environment.

4.2.4 Highest Level of Education

The study sought to also establish the highest level of education of the respondents as presented in the Table.

Table 4.4: Highest Level of Education of the Respondents

Age	Frequency	Percentage
High school	0	0
Technical school		2.7
College	0	0
Bachelors degree	16	43.2
Master's degree	20	54.1
Doctoral degree	0	0
Total	37	100

With regard to the highest level of education of the respondents, the findings indicated that 54.1% of them had attained master's degree level of education, 43.2% had a bachelor's degree while one of the respondents representing 2.7% of the population had his highest level of education from a technical school. None of the respondents had high school, college or doctoral degree as their highest level of education attained. Because of the competitive business environment at Safaricom Ltd, most employees have strived to further their education with post graduate degrees. With various projects been undertaken in the organization most mid-level managers have been trained in PRINCE2 (an acronym for Projects IN Controlled Environments) is a de facto process-based method for effective project management. Used extensively by the UK Government, PRINCE2 is also widely recognized and used in the private sector, both in the UK and internationally. The PRINCE2 method is in the public domain, and offers non-proprietary best practice guidance on project management.

4.2.5 Role of the Respondents in the Organization

The study sought to also establish the role of the respondents as presented in the Table.

Table 4.5: Role of the Respondents in the Organization

Role	Frequency	Percentage
Upper management	1	2.7
Middle management	13	35.1
Junior management	16	43.2
Administrative staff	3	8.1
Support staff	3	8.1
Interns	1	2.7
Total	37	100

Findings on the role of the respondents in the organization indicated that 43.2% were at junior management level, 35.1% in middle management, 8.1% each were administrative and support staff while both upper management and interns represented 2.7% each of the respondents. According to Safaricom's sustainability report 2015, on the whole, their staff complement is pretty evenly split between men and women, although the number of women in more senior management positions remains relatively low. Most of the respondents interviewed who were from junior management are directly involved in implementation of telecommunication network equipment projects in the organization.

4.2.6 Years of Project Management Experience

The study sought to also establish the number of years of experience in project management by the respondents as presented in the Table.

Table 4.6: Years of Project Management Experience

Years of experience	Frequency	Percentage
1	5	13.5
2	6	16.2
3	5	13.5
4	4	10.8
5	4	10.8
6	4	10.8
7	3	8.1
8	5	13.5
12	1	2.7
Total	37	100

The Table reveals that 13.5% of the respondents had 1year experience in project management, 16.2% had 2years experience and 13.5% had 3years experience. Respondents with 4 - 6years experience had an equal representation of 10.8% each. Another 8.1% of the respondents had 7years experience, 13.5% had 8years experience while 2.7% had 12years experience. This means that a majority of the respondents have some experience in project management and therefore it should have a positive influence in how telecommunication network equipment projects are implemented in the organization. There is a good balance between those with little experience and those who have more experience in project management.

4.3 The Influence of Scope Management in Implementation of Telecommunication Network Equipment Projects.

When asked how the following aspects of scope management influence the implementation of telecommunication network equipment projects the following responses were received as shown in the Table.

Table 4.7: The Influence of Scope Management

Influence of the Aspects of scope management	No Extent	Little Extent	Moderate Extent	Great Extent	Very Extent
Initiation	5.4%	5.4%	10.8%	40.5%	37.8%
Scope planning	5.4%	2.7%	5.4%	40.5%	45.9%
Scope Definition	5.4%	2.7%	16.2%	32.4%	43.2%
Scope verification	5.4%	2.7%	18.9%	27%	45.9%

When asked about their views on initiation, scope planning, scope definition and scope verification which are the aspects of scope management 40.5% thought initiation to have a great extent of influence and 37.8% of them thought initiation to have a very great extent of influence. 45.9% thought scope planning to have influence to a very great extent while 40.5% thought the influence to be at a great extent. Scope definition was also highly rated with 43.2% rating the influence as very great extent and 32.4% rating scope definition influence to be at a great extent. Most of the respondents were of the opinion that scope management planning was of great importance in implementation of telecommunication network equipment projects in the organization. These findings are in agreement with the argument by P. Newton (2015) that it is necessary to create a scope plan that describes how the scope of the project will be defined and managed throughout the life of the project. This task involves the project manager, the project sponsor, selected team members, selected stakeholders, anyone with responsibility for any scope

management process, and others as needed. The resulting scope plan will describe how the scope will be defined, developed, monitored, controlled, and verified.

4.4 The Influence of Project Time Management in Implementation of Telecommunication Network Equipment Projects.

The Table shows the responses with regard to the influence of time management in implementation of telecommunication network equipment projects

Table 4.8: Influence of Time Management

Influence of the Aspects of Time management	Very Poor	Poor	Neither good nor poor	Good	Very good
Activity definition	2.7%	13.5%	16.2%	59.5%	8.1%
Activity Sequencing	2.7%	10.8%	24.3%	54.1%	8.1%
Activity duration Estimating	2.7%	13.5%	40.5%	37.8%	5.4%
Schedule development	2.7%	13.5%	40.5%	37.8%	5.4%
Schedule control	2.7%	13.5%	43.2%	29.7%	10.4%

Most of the respondents 59.5% thought activity definition was good while 54.1% thought activity sequencing was good as well. 43.2% of the respondents were not sure about schedule control. Regarding activity duration estimation 40.5% of the respondents rated as neither good nor poor. 40.5% rated schedule development as neither good nor poor. Jointly 37.8% of the respondents agreed that activity duration estimation and schedule development was good. Only 29.7% of the respondents thought schedule control was good. From the results it can be seen that time management has a low rating with regard to implementation of telecommunication network equipment projects in the organization. The importance of activity duration estimation, schedule development and schedule control should be emphasized to those involved in the projects. According to Wiley-

Blackwell (2010) in order to ensure that the timing of the project is managed effectively a time model should be developed. The purpose of the time - model is to indicate when in the future and in what sequence the planned work is to be performed, so that the intended work and the consequences of any changes, or departures from that intention can be predicted, communicated and managed efficiently. Because, at any one time, the time - model can only be as accurate a prediction of the future as current knowledge will allow, it must be conceived as a model which can be improved upon as information becomes available or circumstances change. In order to facilitate efficient time management, the time - model should be constructed so as to differentiate between work that can be predicted; in outline in the long term; in detail but with some information missing in the medium term; and accurately as to the content sequence and resources to be employed on work which will be carried out in the short term.

4.5 The Influence of Project Cost Management in Implementation of Telecommunication Network Equipment Projects

The Table shows the responses with regard to the influence of cost management in implementation of telecommunication network equipment projects

Table 4.9: The Influence of Cost Management

Influence of the Aspects of Cost management	Very Satisfied	Satisfied	Neither satisfied nor Unsatisfied	Unsatisfied	Very unsatisfied
Resource planning	10.8%	43.2%	8.1%	27%	10.8%
Selection of estimating method	10.8%	40.5%	18.9%	21.6%	8.1%
Cost estimation	10.8%	37.8%	24.3%	21.6%	5.4%
Budgeting	16.2%	32.4%	18.9%	18.9%	13.5%

The information in the Table reveals that 43.2% were satisfied with resource planning, 40.5% were also satisfied with the selection of estimating method. 37.8% of the respondents were satisfied with cost estimation while 32.4% were satisfied with the way budgeting is done in the organization. Only 27% of the respondents were unsatisfied with resource planning. In agreement with most of the respondents the cost management process is most effective when it is formalized and integrated with the enterprise's project management policies and procedures. A formalized cost management process ensures that all project personnel in all projects follow a specific set of established procedures. A formal management structure has the added advantage of keeping all project stakeholders involved in, or at least informed of, the performance status of the project, thereby contributing to team spirit and good morale. The objectives of the cost management

process are to track progress, compare actual values to planned values, analyze the impact of variances, and make adjustments in light of these variances. Parviz (2002).

4.6 The Influence of Project Procurement Management in Implementation of Telecommunication Network Equipment Projects.

The Table shows the responses with regard to the influence of procurement management in implementation of telecommunication network equipment projects

Table 4.10: The Influence of Procurement Management

Influence of the Aspects of Procurement management	Very Poor	Poor	Neither good nor poor	Good	Very good
Soliciting planning	0%	5.4%	21.6%	64.9%	8.1%
Solicitation	0%	10.8%	32.4%	51.4%	5.4%
Source selection	0%	5.4%	27%	54.1%	13.5%
Contract administration	0%	8.1%	24.3%	48.6%	18.9%
Contract close-out	0%	16.2%	24.3%	45.9%	13.5%

Five procurement processes were analyzed in relation to implementation of telecommunication network equipment projects. These included: soliciting planning, solicitation, source selection, contract administration and contract close-out. On soliciting planning as a process of implementation of telecommunication network projects most respondents 64.9% agreed that it was good while 5.4% stated the process was poor. 21.6% were undecided on the role of soliciting planning. 51.4% of the respondents stated that the solicitation procedure in the organization was good, 32.4% were undecided while 10.8% said the solicitation process was poor. 54.1% of the respondents said that the source selection process was good while 48.6% of the respondents agreed to the fact that contract administration was good. None of the

respondents commented on the procurement management processes to be very poor. Most of the respondents agreed on how procurement management is important with regards to implementation of telecommunication network equipment projects

These findings concur with the argument by Lindstrom (2014) that the project plan is the basis for all actions and decisions made about the project. In procurement, the procurement plan is also the basis for all actions and decisions. Procurement planning is the process of identifying which project needs can be best met by procuring products or services outside the project organization. It involves consideration of whether to procure, how to procure, what to procure, how much to procure, and when to procure it. When the project obtains products and services from outside the performing organization, the processes from solicitation planning through to contract close-out would be performed once for each product or service item. The project management team should seek support from specialists in the disciplines of contracting and procurement when needed. When the project does not obtain products and services from outside the performing organization, the processes from solicitation planning through to contract close-out would not be performed. This often occurs on research and development projects when the performing organization is reluctant to share project technology and on many smaller, in-house projects when the cost of finding and managing an external resource may exceed the potential savings.

4.7 The Influence of Project Communication Management in Implementation of Telecommunication Network Equipment Projects.

When asked how the influence of communication management aspects are with regard to the implementation of telecommunication network equipment projects in the organization, the following responses were received as shown in the Table.

Table 4.11: The Influence of Communication Management

The Influence of Communication management	No Extent	Little Extent	Moderate Extent	Great Extent	Very Extent
Communication planning	2.7%	10.8%	24.3%	56.8%	5.4%
Information distribution	2.7%	8.1%	27%	54.1%	8.1%
Performance reporting	2.7%	2.7%	13.5%	48.6%	32.4%
Administrative closure	2.7%	5.4%	21.6%	56.8%	13.5%

From table 4.9 above 56.8% of the respondents stated the success of communication planning to be at a great extent. The findings are in line with the argument by Culo (2010) that planning communications is the process of determining the project stakeholder information needs and defining a communication approach. The process responds to the information and communications needs of the project stakeholders; for example, who needs what information, when they will need it, how it will be given to them, and by whom. A communication plan allows the project manager to document the approach to communicate most efficiently and effectively with stakeholders. Effective

communication means that the information is provided in the right format, at the right time, and with the right impact. Efficient communication means providing only the information that is needed. The results of this planning process should be reviewed regularly throughout the project and revised as needed to ensure continued applicability. When it comes to delivery, there are many issues to consider especially if there is a team that spreads across organizational or geographical boundaries. Proper information distribution makes information available to project stakeholders in a timely manner. This was supported by 54.1% of the respondents who agreed that information distribution success was to a great extent.

With regards to administrative closure 56.8% of the respondents said the extent of its success in implementation of telecommunication network equipment projects was at a great extent, 2.7% said to no extent while 21.6% said it was moderate. This is in line with the argument by Sanghera (2009) that one must understand that the project closure includes two important parts: administrative closure of the whole project and contract closure of the procurement part of the project. You must know both processes: Close Project and Close Procurements. During closure, you must follow standard accounting practices and comply with the legal procedures and laws. 48.6% of the respondents said performance reporting success was to a great extent while 32.4% of the respondents indicated that performance reporting was successful to a very great extent.

4.8 The Ranking of Project Management Knowledge Areas that Influence Telecommunication Network Equipment Projects.

The Table shows the ranking of the key project management knowledge areas in terms of importance when implementing of telecommunication network equipment projects at Safaricom.

Table 4.12 Ranking of the Project Management Knowledge Areas:

Knowledge Areas	Ranking (1= Top Most)	Percentage
Project scope management	1	62.4
Cost management	2	54.6
Procurement management	3	47.3
Time management	4	40.5
Communication management	4	40.5

From the Table 62.4% of the respondents stated that project scope management was most important to them. This is in line with the argument by Newton (2015) that getting the scope right on a project is one of the most important elements of achieving success in the end. Only when the scope is dialed in correctly can everything else in the project be completed according to plan. The resources dedicated to a project can take on many forms, but all of them are important. The scope of a project takes a view of these resources as a whole to determine if the project has what is needed to reach the goal that has been laid out. 54.6% of the respondents ranked cost management as the second most important key process area. The task for the cost management function is to produce information for internal users who need accurate, detailed and frequent economic information for making decisions (Belkanoui, 1993). Specifically, cost management “identifies, collects, measures, classifies, and reports information that is useful to

managers for determining the costs of products, customers, and suppliers, and other relevant objects and for planning, controlling, making continuous improvements, and decision making” (Hansen & Mowen, 2006). Project cost management includes three major functions called cost estimating, budgeting and cost control (Project Management Institute [PMI], 2004). The goal of these functions is to “ensure that the project is executed in a cost efficient, profitable manner, according to business principles and from the perspective of the entire company” (Artto et al., 2011). 47.3% of the respondents ranked procurement management as the third most important process area. Jointly time management and communication management were ranked fourth by 40.5% each of the respondents. The PMBOK guide dedicates one of ten knowledge areas to project time management, which includes the processes required to accomplish timely completion of the project. This knowledge area includes processes such as Activity Definition, Activity Sequencing, Activity Resource Estimating, Activity Duration Estimating, Schedule Development, and Schedule Control. The appropriateness of project time management 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.

According to Culo (2010) Project managers communicate by using different mediums to convey a message. The important factors involve communicating how the project will be managed, including how information will flow into and out of the project. There should be also a clear and concise communication plan to address project responsibilities and the types of communication that will take place. It includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information.

4.9. The Relevance of Top Management Support with Regard to Implementation of Telecommunication Network Equipment Projects.

The study sought to also establish the relevance of top management support with regard to implementation of telecommunication network equipment projects as shown in the Table

Table 4.13: The Relevance of Top Management Support

Relevance	Respondents	Percentage
Yes	33	89.2
No	4	10.8
	37	100

When it came to whether top management support was relevant to implementation of telecommunication network equipment projects in the organization, 89.2% of the respondents said yes while 10.8% said no. This means majority of respondents clearly agreed that top management support was relevant to the implementation of the projects. According to Kerzner (2014) visible management support is essential to maintaining a project management culture. And above all, the support must be continuous rather than sporadic. As project sponsors, senior managers provide support and encouragement to the project managers and the rest of the project team. Companies excellent in project management have the following characteristics; senior managers maintain a hands-off approach, but they are available when problems come up, senior managers expect to be supplied with concise project status reports. Senior managers practice empowerment. Senior managers decentralize project authority and decision-making. Senior managers expect project managers and their teams to suggest both alternatives and recommendations for solving problems, not just to identify the problems. Top management needs to publicly and explicitly identify the project as a top priority Wee, (2000). Senior management must be committed with its own involvement and willingness to allocate valuable resources to the implementation effort Holland et al. (1999). This

involves providing the needed people for the implementation and giving appropriate amount of time to get the job done Roberts and Barrar, (1992).

4.10 The Need to Have Skilled Employees with Regard to Implementation of Projects.

The study sought to also establish the need to have skilled employees with regard to implementation of telecommunication network equipment projects at Safaricom Limited as shown in the Table.

Table 4.14: The Need for skilled Manpower in Project Implementation

Opinion	No. of Respondents	Percentage
Yes	6	16.2
No	31	83.8
TOTAL	37	100

The table shows that majority of the respondents 84% agreed to the need to have skilled employees in implementation of projects while 16% of the respondents said no. This is in line with the argument of Kerzner (2014) that in a technical company employing large numbers of highly skilled engineers, some of which are promoted to project management, the technical aspects of project management such as planning, scheduling and cost control are the least difficult to implement. Junior employees do need training in this area but the real challenge for reaching operational excellence in project management, a flawless project execution, desirable projects result and a high level of customer satisfaction lies in identifying and developing project managers with the right business

acumen. Project management is a management position requiring excellent commercial, communications and leadership skills. A project manager must be very business minded, be able to communicate effectively with a variety of different stake holders and possess the ability to lead and motivate people.

4.11. Data Validation Tests

Stepwise multiple regression was used to determine the effects of scope management, time management, cost management, procurement management and communication management on implementation of telecommunication network equipment projects. Stepwise regression is based on the entry order of independent variables based on which variables contribute most to prediction at a given step in the regression equation. If the P value is equal or less than 0.5, then there is a strong correlation between the respective variables and implementation of telecommunication network equipment projects. *** represents P values of less than 0.001.

The regression model for this study:

$$\mathbf{Implementation} = \alpha + \beta_1 \text{scope} + \beta_2 \text{time} + \beta_3 \text{cost} + \beta_4 \text{procurement} + \beta_5 \text{communication}$$

Table 4.15 : The Correlation of Variables

Dependent variable	Independent variables	Estimate	S.E.	C.R.	P	Comments
Implementation	<--- scope	.566	.230	2.461	.014	S
Implementation	<--- time	-.412	.175	-2.358	.018	S
Implementation	<--- cost	-.112	.070	-1.592	.111	NS
Implementation	<--- procurement	.888	.057	15.641	***	S
Implementation	<--- communication	.031	.078	.400	.689	N

*S is significant *N not significant

The correlation between project scope management and implementation has a positive significant effect because the P value is 0.014 which is less than 0.05. The correlation between project time management and implementation has a negative significant effect because the P value which is 0.018 is less than 0.05. Project cost management does not have a significant effect on implementation because its P value is greater than 0.05. Procurement management influences implementation because its P value is less than 0.001. Lastly communication management does not have a significant effect on implementation because its P value which is 0.689 is greater than 0.05. The model equation is presented as:

$$\text{Implementation} = 0.56 (\pm 0.23) * \text{scope} - 0.412 (\pm 0.18) * \text{time} + 0.888 (\pm 0.06) * \text{procurement}$$

CHAPTER FIVE: SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a discussion of the key findings of the study as analyzed in chapter four. Answers to the research questions, conclusions and recommendations have also been drawn from the study and suggestions for further research have been made.

5.2 Summary of findings

On how the aspects of project scope management influence implementation of telecommunication network equipment projects, the study found that 45.9% of the respondents agreed that scope verification influence was to a very great extent. Jointly 40.5% of the respondents agreed that both scope initiation and scope planning influence was to a great extent. 43.2% of the respondents stated the influence of scope verification was to a very great extent. Scope management was ranked the most important knowledge area in implementation of telecommunication network equipment projects in the organization by the respondents.

On the rating of time management processes with regard to implementation of telecommunication network equipment projects most of the respondents 59.5% stated that activity definition was good and only 2.7% of the respondents stated it to be very poor. 54.1% of the respondents agreed that activity sequencing was good while jointly 40.5% of the respondents stated that both activity duration estimation and schedule development was neither good nor poor. Only 29.7% of the respondents stated that schedule control was good while at the same time 43.2% of the respondents stated that schedule control was neither good nor poor. Project time management knowledge management area was ranked jointly at fourth with project communication management by the respondents.

On the rating of cost management support processes with regard to implementation of telecommunication network equipment projects 43.2% of the respondents were satisfied with the resource planning process. 40.5% of the respondents were satisfied with the selection method used in cost management while 37.8% of the respondents were also satisfied with the cost estimation process. 13.5% of the respondents were very unsatisfied with the budgeting process while 32.4% of the respondents were satisfied with the budgeting process. Project cost management was ranked the second most important knowledge management area when implementing telecommunication network equipment projects in the organization.

With regard to the procurement management processes in implementation of telecommunication network equipment projects most 64.9% of the respondents stated that soliciting planning was good. 54.1% of the respondents stated source selection to be good and none of the respondents rated it to be poor. 32.4% of the respondents stated that solicitation was neither good nor poor and 51.4% stated solicitation to be good. 48.6% of the respondents stated that contract administration was good while 45.9% of the respondents rated contract close-out to be good. Project procurement management was ranked the third most important knowledge management area by respondents when it comes to implementation of telecommunication network equipment projects in the organization.

On the success on the aspects of communication management with regards to implementation of telecommunication network equipment projects 56.8% stated that communication planning success was at a great extent. 54.1% of the respondents stated that information distribution success was at a great extent. The success of performance reporting was stated to be at a great extent by 48.6% of the respondents. Most 56.8% of the respondents stated that administrative closure success was to a great extent.

Findings established that 91% of the respondents stated yes with regard to the relevance of top management support in implementation of projects while 9% said no.

On the need to have skilled employees with regard to implementation of projects in the organization majority 84% of the respondents said yes while 16% said no.

5.3 Discussion of Key Findings

Factors influencing implementation of telecommunication network equipment projects have emanated from this study. Discussions on the findings of the study are presented following the objectives.

5.3.1 The Influence of Scope Management in Implementation of Telecommunication Network Equipment Projects

The factors analyzed in this study were scope initiation, scope planning, scope definition and scope verification. From the findings from the questionnaires, most of the respondents agreed that all aspects of scope management have influence on implementation of telecommunication network equipment projects with scope planning and scope verification having a very great extent of influence. According to P. Newton (2015) it is necessary to create a scope plan that describes how the scope of the project will be defined and managed throughout the life of the project. This task involves the project manager, the project sponsor, selected team members, selected stakeholders, anyone with responsibility for any scope management process, and others as needed. The resulting scope plan will describe how the scope will be defined, developed, monitored, controlled, and verified. Project scope verification is an important process in ensuring that the project team delivers exactly what the customer requested Brewer & Dittman (2010) and also in ensuring that project scope changes are minimal Schwalbe (2011). It is the process that formalizes the acceptance of the project scope.

5.3.2 The Influence of Time Management processes in Implementation of Telecommunication Network Equipment Projects.

The factors analyzed here were activity definition, activity sequencing, activity duration estimation, schedule development and schedule control. There were mixed reactions from the respondents in relation to the influence of time management where respondents rated activity duration estimation, schedule development and schedule control as neither good nor bad.

Olaf (2009) pointed out that activity duration estimating process requires that the amount of work effort required, the assumed amount of resources to be applied to complete the schedule activity is estimated and the number of work periods needed to complete the schedule activity is determined. All data and assumptions that support duration estimating are documented for each activity duration estimating. He also stated that schedule development is the instruction regarding the start and finish date for a project activity. If the start and the finish dates are not realizable, the project will probably not be finished on time. The time schedule development process must be often repeated before the project time schedule will be finished. Schedule control is concerned with influencing the factors that create schedule changes, determining the current status of the project schedule, determining that the project schedule has changed, and managing the actual changes as they occur. Schedule control must basically be connected with the other control procedures.

5.3.3 The Influence of Cost Management processes in Implementation of Telecommunication Network Equipment Projects.

The factors analyzed here were resource planning, selection of estimating method, cost estimation and budgeting. From the responses received from the questionnaires most of the respondents were satisfied with the cost management process. The resource planning process had the highest number of people who were satisfied with the process and at the same time it had the highest percentage of people who were unsatisfied with the process amongst the four cost management processes. The PMBOK (2010) states that every organization has a limited number of resources to perform tasks. A project manager's

primary role is to find a way to successfully execute a project within these resource constraints. Resource planning is comprised of establishing a team that possesses the skills required to perform the work, as well as scheduling the non-labor resources (tools, equipment and processes) that enable the staff to complete the project.

5.3.4 The Influence of Procurement Management Processes in Implementation of Telecommunication Network Equipment Projects.

The factors covered in this research question included soliciting planning, solicitation, source selection, contract administration and contract close-out. From the responses received from the questionnaires, the factor that came up prominently in relation to implementation of telecommunication network equipment projects was soliciting planning, solicitation and source selection. According to Lafayette (2012), a common mistake made on projects is the idea that solicitation and vendor selection is part of project planning or worse yet done before a project is initiated. Part of the confusion lies in the fact that project planning is intended to overlap the early project execution work activities; therefore it seems unclear whether solicitation and selection are planning or executing activities. During project execution the project obtains solicitations from prospective sellers, i.e. quotations, bids, offers, or proposals, as appropriate. The project evaluates the proposals based on the defined evaluation criteria given in the Request for Proposal (RFP). The result of the evaluation process is the selection of a seller. Then the project will work with the contracts unit to negotiate and sign a contract. Once a contract is in place the project begins the execution of contract administration. Contract administration focuses on managing the relationship with the seller. Contract administration is the work activities that ensure the seller's performance meets contractual requirements. On larger projects with multiple products and service providers, a key aspect of contract administration is managing the interfaces among the various providers.

5.3.5 The Influence of Communication Management Processes in Implementation of Telecommunication Network Equipment Projects.

The factors covered in this research question included communication planning, information distribution, performance reporting and administrative closure. The importance of the aspects of communication management all stood out. Communications Management includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information. Effective project managers spend about 90% of their time communicating with team members and other project stakeholders, whether they are internal (at all organizational levels) or external to the organization. Effective communication creates a bridge between diverse stakeholders involved in a project, connecting various cultural and organizational backgrounds, different levels of expertise, and various perspectives and interests in the project execution or outcome. There should be also a clear and concise communication plan to address project responsibilities and the types of communication that will take place. The communication plan – like the project plan - is a necessary part of the project. Culo (2010).

5.4 Conclusions

From the findings and discussions in the research, it could be concluded that project scope management, time management, cost management, procurement and communication management influence the implementation of telecommunication network equipment projects in the organization. Depending on the need the other knowledge areas which are project integration, risk management, human resource management and quality management can influence the implementation of telecommunication network equipment projects.

Another conclusion is that there is need to have skilled employees and top management support in implementation of telecommunication network equipment projects in the organization. Technology-intensive projects require special knowledge, skill sets, and competencies to do the technical work. They also require sophisticated people skills, the ability to deal with organizational conflict, power, and politics, and the ability to work

effectively in teams across functional lines toward project integration. Consistently, the project management literature has found that top management support positively contributes to project success (Besner and Hobbs, 2008; Lester, 1998; Whittaker, 1999; Zwikael and Globerson, 2004; Johnson et al., 2001; McManus, 2004). These studies show that top management support is considered to be among project management critical success factors (CSFs).

It can also be concluded that for each knowledge area in the study there is a process. Each process has pre-requisites (known as inputs), tools and techniques you can use to actually do the process, and then outputs: one of more things that you get as a result of having done the process. The achievement of those things lets you know the process is over (at least until the next time you need to use it). These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals based on the needs of the project.

5.5 Recommendations

Based on this study's findings, various recommendations came up and most of them aimed at improving the implementation of network equipment projects in Safaricom Ltd. They include:

1. The management should invest in project integration management which includes the processes required to ensure that the various elements of the project are properly coordinated. It involves making trade-offs among competing objectives and alternatives in order to meet or exceed stakeholder needs and expectations. Getting the scope just right on a project is one of the most important elements of achieving project success in the end. Only when the scope is dialed in correctly can everything else in the project be completed according to plan.
2. The organization should create more awareness of its time management model. Its purpose is to create time to focus on important things before they become urgent. Sometimes this just means doing things earlier. The real skill is to commit time

processes that enable you to do things more quickly or more easily, or ensure that they get done automatically.

3. The management has to ensure that the organization acts cost consciously to leverage operational saving measures. The organization has to have the tools and procedures, including full cost transparency, in place.
4. Currently, demand for project management professionals is not matched by availability of resources with relevant project management skills therefore there is need for the organization to put active efforts to develop project management skills and techniques of its employees within the organization.
5. Communication can get stale when the same stakeholders make the same decisions year in and year out. Including a fresh set of eyes in the communication process will help the organization identify risks and potential mistakes.

5.6 Recommendations for Further Research

Based on the findings of the research undertaken, the researcher identified various areas which call for further investigations in the future especially in project implementation activities.

1. There is need to address the challenges faced by project managers when implementing telecommunication network equipment projects in Kenya.
2. The study also recommends research be done to investigate the impact of project management information systems on project managers and project success.

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APPENDICES

APPENDIX 1: INTRODUCTION LETTER

Mukopi George Mukwa,
P.O.BOX 34268-00100,
NAIROBI.

29th September, 2015

Dear Sir/Madam,

RE: REQUEST TO FILL OUT QUESTIONNAIRES

I am a student of the University of Nairobi pursuing a Master of Arts degree in Project Planning and Management currently conducting a research study on the *factors influencing implementation of telecommunication network equipment projects in Kenya: A case of Safaricom Limited.*

You have been selected as one of the respondents to assist in providing the requisite data and information for this undertaking. I kindly request you to spare a few minutes and answer a few questions. The information obtained will strictly be used for the purpose of this study. Your identity will be anonymous and your name shall not be recorded.

Kindly respond to all the questions honestly and truthfully.

Yours faithfully,

Mukopi George Mukwa

0721760554

APPENDIX 2: QUESTIONNAIRE

A. Bio-Data: Tick (√) where appropriate.

- 1 Gender: Male () Female ()
- 2 Age: 18-25yrs () 26-40yrs() 41-55yrs() 56 or older ()

B. Basic Information

3. What is the highest level of education you have completed?

- i. High school () ii. Technical school () iii. College ()
- iv. Bachelors degree () v. Master’s degree () vi. Doctoral degree ()

4. Which of the following best describes your role in the organization?

- i. Upper management () ii. Middle management () iii. Junior management ()
- iv. Administrative staff () v. Consultant () vi. Support staff vii. Intern ()

5. Department that you are in

Department	Please tick once
Project Management	
Network Roll Out	
Procurement	
Transmission	
Contract Management	

6. Years of project management experience.....

C: Project Scope Management

7. To what extent do the following aspects of project scope management influence the implementation telecommunication network equipment projects in the organization?
 Use a scale of 1-5 where; 1 No extent, 2 little extent, 3 Moderate extent, 4 Great extent and 5 Very great extent.

	1	2	3	4	5
Initiation					
Scope planning					
Scope definition					
Scope verification					

D: Time Management

8. Kindly rate the organizations project time management processes with regard to implementation of telecommunication network equipment projects.

	Very poor	Poor	Neither good nor poor	Good	Very good
Activity definition					
Activity sequencing					
Activity duration estimating					
Schedule development					
Schedule control					

E: Cost Management

10. On a scale of 1 – 5 kindly rate the following project cost management support processes in the organization with regard to implementation network equipment of projects. Use the scale where 1= Very satisfied, 2= Satisfied, 3 = Neither satisfied nor unsatisfied, 4= Unsatisfied, 5= Very unsatisfied.

	Factor	1	2	3	4	5
1	Project definition					
2	Selection of estimating method					
3	Cost estimation					
4	Budgeting					

F: Procurement Management

11. Kindly rate the organizations project procurement management processes with regard to implementation of telecommunication network equipment projects.

	Very poor	Poor	Neither good nor poor	Good	Very good
Soliciting planning					
Solicitation					
Source selection					
Contract administration					
Contract close-out					

G: Communication Management

12. To what extent is your company successful in the following aspects of communication management with regards to implementation of telecommunication network equipment projects? Use a scale of 1-5 where; 1 No extent, 2 little extent, 3 Moderate extent, 4 Great extent and 5 Very great extent.

	1	2	3	4	5
Communication planning					
Information distribution					
Performance reporting					
Administrative closure					

H: Knowledge Management Areas

13. Please rank the listed knowledge management areas according to their importance in implementation of telecommunication network equipment projects, with 1 as the most important and 5 the least important.

	1	2	3	4	5
Project scope management					
Time management					
Cost management					
Procurement management					
Communications management					

I: Top Management Relevance

14. Do you find top management support relevant with regard to implementation of telecommunication network equipment projects in the organization?

Yes No

J: Skilled Manpower

15. Do you find the need of employees in the organization to be skilled with respect to implementation of telecommunication network equipment projects?

Yes No

K: General Opinion

16. In your own opinion which factors influence the implementation of telecommunication network equipment projects?

.....
.....
.....
.....

17. Which kind of problems do you encounter when implementing projects in the organization?

.....
.....
.....
.....

THANK YOU FOR YOUR TIME AND PARTICIPATION

APPENDIX 3: RESEARCH PERMIT

[ON NOTEPAPER OF UNIVERSITY]

[Insert Date]

Safaricom Limited
Safaricom House
Waiyaki Way
P.O. Box 66827-00100
NAIROBI

Dear Sirs

**RE: INDEMNITY IN RESPECT OF THE RESEARCH TO BE UNDERTAKEN BY MUKOPI GEORGE
MUKWA AT SAFARICOM LIMITED**

We refer to the above matter.

We write to confirm that Mukopi George Mukwa is a Masters student based at the University of Nairobi In fulfilment of the requirements for Masters project, Mukopi George Mukwa will be focusing on the " Factors Influencing Implementation of telecommunication Network Equipment Projects in Kenya

Mukopi George Mukwa has by an email dated 18/11/2015 requested to be allowed to undertake his research at Safaricom Limited. We are aware that in the course of his research he may receive Confidential Information utilized in the course of Safaricom's business operations.

In this regard the University of Nairobi hereby agrees to indemnify and hold harmless Safaricom Limited from and against all claims, liabilities, losses, damages, and expenses incurred (including any legal costs or penalties and liabilities awarded or imposed by a court or expenses properly incurred) by Mukopi George Mukwa pursuant to any breach or non-observance by his obligations or warranties under the Non-Disclosure Agreement which he has executed with Safaricom Limited.

SEALED with the common seal of)
the[])
)
)
)
)
In the presence of)
)
)
.....)
)
.....)

APPENDIX 4: ETHICAL CLEARANCE



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA-MURAL STUDIES
NAIROBI EXTRA-MURAL CENTRE

Your Ref:
Our Ref:
Telephone: 318262 Ext. 120

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
NAIROBI

16th November, 2015

REF: UON/CEES//NEMC/22/471

TO WHOM IT MAY CONCERN

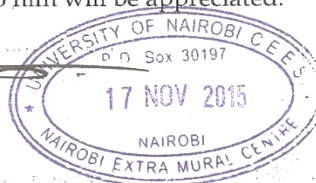
RE: MUKOPI GEORGE MUKWA - REG NO-L50/83031/2012

This is to confirm that the above named is a student at the University of Nairobi, College of Education and External Studies, School of Continuing and Distance Education, Department of Extra- Mural Studies pursuing Master of Arts in Project Planning and Management.

He is proceeding for research entitled "factors influencing implementation of telecommunication network equipment projects in Kenya". A case of safaricom Ltd.

Any assistance given to him will be appreciated.

CAREN AWILLY
CENTRE ORGANIZER
NAIROBI EXTRA MURAL CENTRE



APPENDIX 5: KREJCIE AND MORGAN TABLE

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

APPENDIX 6: RELIABILITY OF INSTRUMENTS

RELIABILITY

/VARIABLES=AcDef AcSeq AcDurEst SchDvpt SchCon

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE

/SUMMARY=TOTAL.

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	37	100.0
	Excluded ^a	0	.0
	Total	37	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.888	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Activity definition	13.4595	9.200	.733	.863
Activity sequencing	13.4865	9.090	.791	.850
Activity duration estimating	13.7297	9.758	.668	.877
Schedule development	13.7297	9.536	.717	.867
Schedule control	13.7027	9.104	.737	.862