ST. MARY'SUNIVERSITY
SCHOOL OFGRADUATE STUDIES
DEPARTMENT OF PROJECT MANAGEMENT

FACTORS AFFECTING THE PERFORMANCE OF TELECOMMUNICATION NETWORK EQUIPMENT PROCUREMENT

THE CASE OF ETHIO TELECOM

BY

MESEKERM FELEKE

FEBRUARY, 2023

ADDIS ABABA, ETHIOPIA

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DECLARATION

I declare that this thesis is my original work and has not been presented in any other university and college. All sources and materials used are duly acknowledged.

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APPROVAL FROM THE ADVISOR'S

The Undersigned certifies that, He has read and hereby recommends for acceptance by the St Mary's University a thesis entitled: "*FACTORS AFFECTING THE PERFORMANCE OF TELECOMMUNICATION NETWORK EQUIPMENT PROCUREMENT IN THE CASE OF ETHIO TELECOM*", in partial fulfillment of the requirements for the MBA of the St Mary's University.

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APPROVED BY BOARD OF EXAMINERS

We, the undersigned certify that we have read and hereby recommend to the Saint Mary's university to accept the thesis submitted by MeskeremFelekeentitled"*FACTORS AFFECTING THE PERFORMANCE OF TELECOMMUNICATION NETWORK EQUIPMENT PROCUREMENT IN THE CASE OF ETHIO TELECOM*"for the fulfillment of the requirement for the award of an MA in Project Management.

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Abstract

The main purpose of this study was to examine the factors affecting performance of Telecommunication Network Equipment Procurement in Ethio Telecom. The research approach was quantitative. Descriptive and explanatory type of research design was used to explain the factors of Telecommunication Network Equipment Procurement that influence Ethio Telecom procurement process and describe the existing procurement practice of the company. The research samples were 70 including managements, experts and administrative employees of Ethio telecom. The primary data was collected using questionnaire. The secondary data was collected using literature. The analysis was done using descriptive and inferential analysis method such as percentage, frequency, correlation and regression. The researcher adopted ten different variables of interest; these are Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, and Relationship with supplier and Risk as factors/ Independent variable for the study as derived from different literature reviews. Major findings include EthioTelecom fail to provide form all training related to project and project procurement management. The company considers make-or-buy analysis, expert judgment, and market research ,past project procurement documents, and activity and cost estimation for planning project procurement. Associated risks and mitigation plan as well as overall procurement need of the project are identified. The company also follows separate project procurement procedure. EthioTelecom prepares standardize procurement document to obtain bid/proposal from suppliers. The company uses pre-defined proposal evaluation criteria and prefers to conduct preliminary screening before making detail evaluation the received proposals. The company is financially dependent on its suppliers for procuring foreign products and services. Ethio Telecom uses tight monitoring and controlling system for products arrived at regional and central warehouse but fail for products arrived directly at project site. As a recommendation company need to provide adequate training, arrange pre-proposal visit especially for its large procurement decisions in order to view the capability of the market site, production factory, and technical and managerial capability of pre identified potential suppliers. Company not to neglect and consider their risk management practice as well as check how they redistribute in satisfactory manner the company should develop tight monitoring and controlling system on those products directly arrived at project site.

Key words: Successful Procurement, Telecommunication Network Equipment, Procurement Practice.

Chapter one

Introduction

1.1.Background of the study

Procurement of network equipment constitutes a major part of mobile telecommunication business. These equipment's are very expensive and purchasing them require the establishment of a sound process in the execution of procurement projects. Since the middle of the last century, many organizations are using project management approach to bring about the change needed to meet organizational goals and objectives.(Ebenezer E. 2019). This is part of each project: be it internal or external, offshore or onshore, with its own distinctive set of challenges. However, attributed to the complicated nature of project activities, challenges related to managing project's constraints of budget, quality and time the changes are distinctive and ever-changing. The management of project constraints explains, if not totally, why several projects fail (Mehmood I, 2019).

The factors range from external forces like government laws, environmental forces, society, pressure teams, monetary markets, labor markets, technology, client influence, stockholder etc. to internal forces like changes in operative processes, management vogue, resources allocation, skills, internal conflicts etc. The situation has led to the assumptions purported by several project management professionals in several industries that if project and line managers will establish what represents a project success and therefore the factors that confirm a thriving outcome of a project, will improve their performance. However, characterizing those factors will make a project successful. Erling et al. (2006) expressed that there is not any clear proof of linking a project success and actual project success. Different departments have unique views about success and failure, and what factors will contribute to either. The technology sector is the most rapidly changing industry and requires creativity. The telecommunication industry constitutes a big part of IT and is often at the middle of technological changes. Hence, has been compelled to contend with perennial processes of procuring new equipment and material for its operations. Panda et al. (2019) pointed that equipment procurement is a frequent activity and it is important to optimize the procurement processes to cut prices. Therefore, procurement processes are a central process of telecommunication business management. This study is about to identify and validate the factors that constitute the procurement of network equipment process.

1.2.Statement of the problem

An effective procurement process is crucial to the success of projects. Depending on the type of project managed, more than 50 percent of the total project cost can be related to purchase parts, supplies and services, and in many high-tech projects, this procurement portion can reach 90 percent.(Morris & Pinto, 2007)

As indicated by Carter (2000), associations have changed their purchasing abilities into upper hand. He added that proactive businesses are now expected to control their purchasing activities in order to gain a competitive advantage. To get an upper hand of any association, obtaining exercises need incredible consideration. As a result, it is essential for businesses to implement a variety of strategic sourcing procedures that are closely connected to the company's overall strategy and customer requirements.

According to Wyman (2013), most of the world's telecommunications operators are renewing their procurement. We can achieve the best supplier relationship, improve risk management and improve rapid growth opportunities. They need to improve their sourcing practices for the benefit of their purchases the choice is becoming more and more diverse, from simple things like switches and routers to many more a wider range of products such as software, IT solutions, maintenance and margin planning resale As technologies change very quickly, their acquisitions are expected to be compatible suppliers to help them be flexible and quick to respond. For example, traditional telecommunications providers Like Ericson and Nokia, margins were severely eroded by aggressive competition from new players like Huawei and ZTE.

It was seen that ethio telecom as government association, has gone to various lengths and activities to further develop the centralized procurement system through business process Reengineering (BPR) and to upgrade proficiency and viability in ethio telecom acquisition tasks by giving the ideal materials and administrations in wording amount, quality with perfect timing and cost.

A study on project management that was carried out by Karlsson (2011) in Sweden and Ethiopia came to the conclusion that the method of procurement management has a significant flaw and that a lack of adequate planning frequently results in production issues when materials, machines, and parts are delivered too late or not at all in Sweden. However, the study was focused on construction companies. Martha (2015) also conducted research on the impact of effective public procurement management on the successful implementation of public projects, but this study focused on the

country's housing development projects. Another study on procurement practices for projects was done on the Alemgena road maintenance project.

Loss of millions of dollars for organizations is because of Many projects around the world keep failing,. Many project management professionals have tried to identify the crucial elements that must be addressed head-on to generate a good project management outcome as a result of this ongoing difficulty. There is literature on crucial success criteria for particular industry sectors or national contexts, but there is little empirical study on crucial success factors for particular organizational operational units, such as the procurement division or the network roll-out division. In some cases, there is a small body of literature on the crucial project management success elements for a specific stage of the project life cycle, such as risk management, planning, etc., but rarely on successful equipment procurement. This has motivated me to conduct initial research on identifying the most important impacting aspects that need to be properly regulated during conversation management in Ethio Telecom. Therefore this paper intended to study Factors affecting the performance of Telecommunication Network Equipment Procurement in the Case of Ethio Telecom.

1.3.Basic Research questions

1. What does the procurement process practice look like in Ethio Telecom?

2. What are the main factors that affect the performance of Telecommunication Network Equipment Procurement in Ethio Telecom?

3. To what extent does each identified factors affectperformance of Telecommunication Network Equipment Procurement in Ethio Telecom?

1.5. Objectives of Study

1.5.1 General objective

The general objective of this study is to examine the factors affecting the performance of Telecommunication Network Equipment Procurement Projects in Ethio Telecom

1.5.2. Specific Objectives

The specific objectives of this research:

1. To examine the procurement process practice in Ethio Telecom

2. To examine the factors affecting the performance of Telecommunication Network Equipment Procurement in Ethio Telecom

3. To explain identified factor effect on the performance of Telecommunication Network Equipment Procurement in Ethio Telecom

1.6. Significance of the Study

The research helps experts, project managers; top managements of the organization under study to have a deeper understanding about performance of telecommunication network equipment procurement project. Findings can be used for organizational learning and improve projects procurement projects methods. The result of this study can be adopted by any organization realistically to plan and formulate its projects policies that are geared to improving the overall performance.

This study is helpful to management and stakeholders to understand the overall procurement system and to negotiate on the gaps to be fulfilled. It is also beneficial for researchers who want to study further in procurement system of telecommunication network equipment projects to bring improvement on the organization.

1.7. Scope of the Study

The study was conducted at Ethio Telecom to assess factors affecting the performance of Telecommunication Network Equipment Project Procurement. The study focused mainly on identifying the critical factors that affects the success or failure of telecommunication network equipment procurement project in Ethio Telecom. This research was focus only in Ethio Telecom, Telecommunication net equipment procurement project. The time horizons undertaking this thesis were four months from March up to June 2023GC.and it uses descriptive and explanatory research design.

1.8. Limitation of the study

Regarding the limitation of the study, it was difficult to find respondents who were willing to take part in the questionnaire survey so as to collect data in broader terms by reaching all the responsible potential personnel's of procurement process in Ethio-Telecom within the specified period of time. This research work is limited to ethio-telecom procurement department and the result may not necessarily represent the reality for the entire Ethio telecom's other departments; but within the target section, procurement department, the study tried to make representative samples in dealing with the research population.

1.9. Organization of the Study

This paper was organized into five chapters; chapter one contain the introduction part dealing with research problems, objectives, and an overview of the case sector, significance, scope, and limitations. The second chapter discuss about the review of related literature about the subject matter which is telecommunication network equipment procurement and the factor that influence it. The third chapter contains the methodology of the study that includes research design, method of data collection, and data analysis. And next chapter deals with the result of data analysis. Finally, chapter five covers the conclusion of the findings and forwards recommendations.

Chapter Two

Literature review

2.1. Theoretical Review

2.1.1. Introduction

The Telecom industry is faced with difficult competitive conditions and demands focusing on several market segments. The primary service elements have seen substantial advancements in data services, value-added services, and mobile broadband. Organizational structure was modified to achieve strategic objectives and meet consumer expectations. The domestic sector, the divestment project, and the overseas industry made up the bulk of the reorganization. Innovative efforts made it possible for the product quality to improve. To address the needs, the items were varied (Scalera 2012).

Improvements to an integrated end-to-end electronic procurement system can reduce information asymmetry. Process improvement guarantees that transaction costs are decreased and profits are increased (Ajulo, 2017). According to Khin, (2017), highlight efficiency in managing the knowledge. Efficiency and cost reductions are increased by the effectiveness of contract arrangements (Agbanyo2016). The management of jig and fixture projects is crucial to the supplier-client relationship (Hamel, 2014). Savings of up to 25% can be found in public procurement. There are identified 11 essential success elements. These elements include stakeholder adoption, education and training, performance measurement, change management, system integration, security and authentication, technology standards, business process re-engineering, business case and project management, E-Procurement Implementation Strategy, and top management support.

The already complex nature of project management is made even more complicated by the dynamic nature of the corporate environment, political unpredictability, rapid technical breakthroughs, unstable financial markets, budgetary issues, and development challenges. It's more difficult to define "Success" due to projects' complexity (Mehmood i. 2019).

This section will review the literature to understand the essential success factors in project management including, project success and essential success factors for procurement management.

2.1.2. Concepts of project and project management

Project management has been practiced in one form or another since agriculture first allowed humans to congregate relatively permanently in villages and cities where they needed to coordinate the activities of multiple participants to complete tasks such as building water supply systems and storehouses for grain, erecting religious edifices and constructing roads and ports(Levitt 2011). According to Kaplinski and Dziadosz(2011), project management facilitates the coordination of operational activities in the life cycle of an investment project (Kaplinski andDziadosz 2011).

Moreover, efficient and effective investment processes management is mainly the result of a variety of multidirectional and comprehensive activities in the area of creation of companies' intellectual capital and preparation of flexible plans and time schedules for investment projects implementation (Paslawski 2008). Integration of these elements makes a company's business activities stand out from its competitors and bring intended market effects and added value (Sobieraj 2020).

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (PMBOK, 2013). Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing. It requires all of the skills of general management to secure the project success

2.1.2. Concepts of Procurement and procurement management in project

Management of a wide range of processes that are connected to an organization's desire to obtain the necessary goods and services for manufacturing a product, transforming inputs into outputs, or indirectly operating the organization is another definition of procurement. Choosing suppliers, negotiating contracts, serving as a liaison between the supplier and the user, and evaluating and forming strategic alliances with suppliers are all components of these processes (Morris & Pinto, 2007).It also handles contract administration, pricing, purchasing, and supplier acquisition. Storage, logistics, inspection, expediting, transportation, and supply handling are also included. Laby et al. (2014), claim thata procurement process consists of a number of steps like buying, transporting, stoking, and providing.

According to Kerzner (2009), procurement is the process of acquiring goods and services by involving two parties—the customer, who is purchasing the item, and the supplier, who is selling it—who have distinct goals and interact within a specific market segment. According to Dimitri,

PigaandSpagnolo (2006), procurement is typically characterized by being a dynamic and ongoing process in which short-term goals frequently conflict with long-term ones.

The procurement process is used to ensure that the buyer receives goods, services, or works at the best possible price when quality, quantity, time, and location are compared because it is economically difficult for businesses to produce all of the materials they use (Wikipedia, 2010). It is likewise a training that can increment corporate benefit by exploiting amount limits, limiting income issues, and searching out quality providers (Kerzner, 2009). Dimitri et al. (2006) state that firms' profitability and survival depend on effective procurement. Yet, the issue is that most organizations see the obtainment cycle as strategic rather than vital and as cost instead of an advantage to the organization (Neef, 2001).

2.1.3. Project success

According to Salleh (2009) The definition of project success is ambiguous. PMBOK 4 th edition (2008) stated that project is successful if it achieves the triple objective outcome of within time, scope, and quality. This is the traditional view of project management as used by Munns and Bjeirmi(1996). It implies the successful achievement of time, cost and quality objectives, as well as the quality of the project process, Erling et al (2006). Turner (2004) identifies on time, within budget and to specification especially for information technology projects as the standard for judging success. Erling et al (2006) stated that overall project success deals with the wider and longer term impact of the project, which means both project management success and project product success.

According to Jonathan, Hashemianfar, and Kasaee (2018), the degree to which a project is successful is dependent on a number of factors. Therefore, ensuring the success of the project is one of the highest concerns for both the project management and the project partners. The design workforce is still grappling with an unclear notion of what constitutes successful project performance. In the world of business, there is no universally accepted or defined definition of what constitutes a successful project, and the circumstances surrounding each project manager are unique.

According to Radujkovic and Sjekavica (2017), the administration of projects is unavoidable in the modern environment. Project administration provides a forum for quality growth across an expanding variety of duties. Moreover, skills like language proficiency, flexibility and adaptability, and critical thinking and problem solving are also very important for an efficient project manager (Islam Shamim,2022).

2.1.4. Critical success factor

Critical success factors are those things that must be done if a company is to be successful (Imtiaz, et al., 2013). Critical Success Factors refer to characteristics, conditions or variables that have a significant impact on the success of a project, when they are properly sustained, maintained and managed (Alias et al., 2014). Critical success factors (CSF) are used to support and measure the success of a strategic approach and tactics for implementation of projects intended to ensure the success of the project and support the proper allocation of limited resources.

Cooper and Klienschmidt (1996) centered on the identification of important success factors for new development, together with an outlined strategy and adequate analysis and development. Westerveld (2003) uses foundation for quality management model to reason important success factors such as: leadership and team, policy and strategy, neutral management, catching, resources, and merchandise management.

Anderson and Jessen (2000) stressed the necessity to separate the particular task and other people whereas evaluating project results. They contemplated that known important success factors supported a stepwise structure and reflective progression through a project. They covered: scope (Project mission and goals, terms of references), designing (planning at world level, designing at detail level), execution (activities, decisions), and management (financial and technical management, internal and external communication). Belassi and Turkel (1996) classified the important success factors into four areas: the project (e.g. size, uniqueness, and urgency), the organization (structure, management support), the external setting (technological, financial, political) and also the project manager and his unit (scope, abilities). Pinto and Slevin (1987) suggested using important success factors to diagnose outcomes.

2.1.5. Project procurement success and success factor

Kerzner (2009), Define Procurement as the acquisition of goods and services by involving two parties customer who is buying and supplier who is selling with different objectives who interact in a given market segment. Procurement characterized by most often a dynamic and repeated activity with short-term objectives often conflicting with long term ones (Dimitri, Piga, &Spagnolo, 2006).

Critical success factors (CSFs) play a crucial part in the success of many systems. It is vital to continually investigate CSFs in any system in order to measure productivity and performance. For e-Procurement systems to be assumed to be successful, the CSFs must have been tested and

established (Ibem,2016). CSFs are defined in this context as creating a central point of reference in measuring the success or failure in the use of e-Procurement systems. By this, industry participants are provided with the focus metrics in terms of activities and priorities that should be achieved for the successful integration of web-based systems in the construction procurement process. The focus metrics in the CSFs is to provide an uncommon strategic tool that helps businesses to be precise, which also ensures their success (Hosseini (2012).

2.2. Theories related to the study subject

2.3. Empirical review

Studies highlight the essential factors that influence the projects to assure success. Alternative literatures (PMBook, 2008; kerzner, 2009), have suggested that procurement management is one of the most important step in a project and, can itself, be considered as a project.

According to Mehmood (2019), they identified basic categories of critical success factor among them the first category is Organizational strategy, which involved critical success factor of Top management support, System training and documentation, System integration, Change Management ,Performance measurement, Good governance, Team building and training. The second category is Contract management which include Negotiations, Competitive procurement process, Supplier process and time, Price, Available financial market, Shared authority between public and private sectors, Transparency in the procurement process, Cost of fuel, electricity, water..etc the third category is User satisfaction which include Relationship with supplier, Security, Risk, Social Support, Partner selection, Experience. The forth categories Technological parameters which includes Technological standards, Project technical feasibility, Technology transfer, the last category is Government policies which include Political support, Government involvement by providing guarantees, Economic policies.

According to Kejuo(2012),MTN Nigeria have identified many critical success factors for network equipment procurement projects, which are listed below: Supplier Process and Time, Price, Technological standard Relationship with Supplier, Top Management support, System training and documentation, System integration, Security, Change management, Performance measurement, Risk.

KhanapuriAt El (2011) mentioned some critical factors that is Cost savings Centralization of procurement, Re-engineering of process Budgetary control, Supplier management, Chang

management, Knowledge pool, Maturity of market place Legal framework. Jefferies et al. (2002) Kopp (1997) ,Gentry and Fernandez (1997) , Arthur Andersen and Enterprise LSE (2000) mentioned Competitive procurement process as a CSF.

Jefferies et al. (2002), Kopp (1997), Gentry and Fernandez (1997) , Arthur Andersen and Enterprise LSE (2000) mention Transparency in the procurement process as a CSF.Qiao et al. (2001) Jefferies et al. (2002) ,McCarthy and Tiong (1991), Akintoye et al. (200 lb) mention Available financial market.

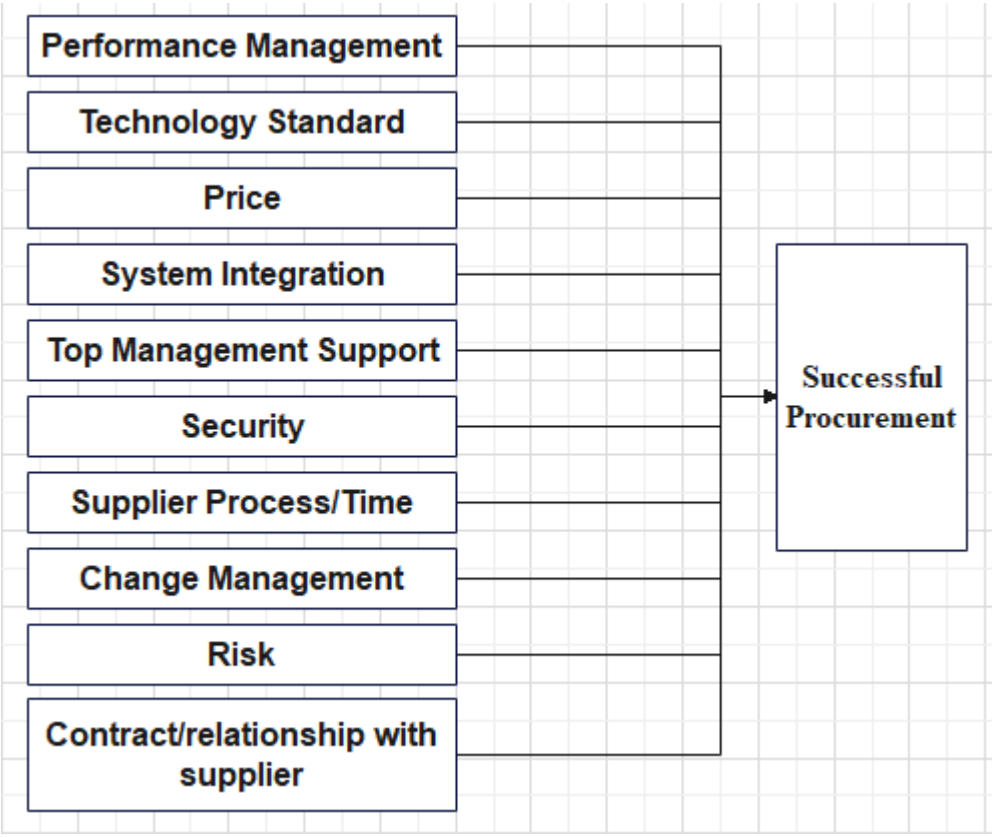
According to S&A (2003), AGV (2003), OGC (2002), CGEC (2002), AOT (2003) Top Management Support is CSF. And DOF (2001), Birks et. al (2001), S&A (2003), Subramanian and Shaw (2002) System Integration is CSF.From the above literatures the following telecommunication network equipment procurement factors are identified these are critical success factor of Top management support, System training and documentation, System integration, Change Management ,Performance measurement, Good governance, Team building and training, Negotiations, Competitive procurement process, Supplier process and time, Price, Available financial market ,Shared authority between public and private sectors, Transparency in the procurement process, Cost of fuel, electricity, water..etc, Relationship with supplier, Security, Risk, Social Support, Partner selection, Experience, Technological standards, Project technical feasibility, Technology transfer, Political support, Government involvement by providing guarantees, Economic policies, Supplier Process and Time, Price, Technological standard Relationship with Supplier, Top Management support, System training and documentation, System integration, Security, Change management, Performance measurement, Risk, Cost savings Centralization of procurement, Re-engineering of process Budgetary control, Supplier management, Chang management, Knowledge pool, Maturity of market place Legal framework. Competitive procurement, Transparency in the procurement process, Available financial market, Top Management Support, System Integration.

2.4. Research gap

The purpose of the research is to identify, from the point of view of Ethio Telecom, the critical success factors a project manager need to watch out carefully while executing an equipment procurement project, as well as rank them in order of importance. Accordingly the following factors are selected for further analysis, Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, and Contract/relationship with supplier, Change Management and risk.

2.5. 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 10 independent variables: Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Contract/relationship with supplier, Change Management, risk with the dependable variable which is procurement of telecommunication network equipment projects.



Source:- adapted from Kejuo K. (2012).

Figure 1. Conceptual frame work

Chapter Three
Research design and Methods

3.1.Background of the organization

According to Getaw (2016), Telecommunications service was introduced in Ethiopia by Emperor Menelik II in 1894 when the construction of the telephone line from Harar to the capital city, Addis Ababa, was commenced. Then the interurban network was continued to expand satisfactorily in all other directions from the capital. Many important centers in the Empire were interconnected by lines, thus facilitating long distance communication with the assistants or operators at intermediate stations frequently acting as verbal human repeats between the distant calling parties. First, the management of the service was under the Imperial Court of Menelik II in the name of the Central Administration of Telephone and Telegraph System of Ethiopia‖ from 1890 up to 1907. After the independence from the Italian occupation, the re-established Ministry of Post, Telegraph and Telephone took over the running of Telephone, Telegraph and Radio communications. It, therefore, rehabilitated the network of the whole country.

The Establishment of Ethio Telecom: - Ethio telecom is a sole telecom operator in Ethiopia established as a public enterprise on 29th day of November 2010 as per the Council of Ministers Regulation No. 197/2010. The company aims to provide next generation network services based on a world class standard information technology services and to build a competent next generation network by introducing different projects.

The Program Management Division is one of the company's sixteen divisions and is in charge of managing the company's project management methodologies, skills, and tools. It's essential goal is to accomplish all of the task objectives and focuses while regarding the biased undertaking imperatives. It also aims to optimize the allocation and integration of inputs required to achieve predetermined goals. The extent of the division is restricted to cause follow up of undertakings which to satisfy one or blend of the accompanying boundaries. The total cost of the project need to be greater than 10 million Birr, the scope of the project needed to cover more than 2 divisions and/or the project required to have strategic importance for the company. Other projects that do not meet one of the above requirements fall under the supervision of their own respective division. There are two types of projects identified by the Program Management division called Hardware Projects that include infrastructural expansion assigned to Network division of the company and the Software Projects which is assigned to the Information System division.

The Sourcing and Facilities division has three sections. Sourcing section organizes the purchasing control and delivery of goods and services within the appropriate framework and in accordance with the company strategic plan and budget. It manages the company relationship with its suppliers and partners. The section is responsible both for the day-to-day operation as well as for projects procurement. The Logistics section optimizes logistics resources to facilitate goods management by optimizing the Warehouse management, by facilitating goods shipment and by performing inventory management. The Facilities and Fleet section provides facilities and fleet to the whole company.

3.2.Research Design

In this thesis descriptive and explanatory research design were used. The object of descriptive research is 'to portray an accurate profile of persons, events or situations' (Robson 2002:59). According to Kothari (2004) descriptive research studies are concerned with describing the characteristics of a particular individual or groups therefore this design is helpful by describing the situation as the research is started with a description of the things that are easily observed to get the actual picture of the industries flow. It is helpful in assessing procurement of telecommunication network equipment and the determinant factors identified by this thesis. In addition to these, the research is cross-sectional survey type. According to Saunders, Lewis and Thornhill (2009) cross-sectional, is the study of a particular phenomenon at a particular time. Therefore, this thesis is a cross sectional survey which investigate the factor affecting telecommunication network equipment procurement in Ethio Telecom. The time horizons undertaking this thesis were four months from March up to June 2023GC.

Explanatory research may be termed Studies that establish causal relationships between variables. The emphasis here is on studying a situation or a problem in order to explain the relationships between variables. In this thesis telecommunication network equipment procurement as dependent and affecting factor as independent variables was assessed. Therefore, explanatory research approach is help full in investigating the relationship between the independents and dependent variables relationships.

3.2. Research Approach

Researchers identify three different approaches to the social science research: qualitative, quantitative and mixed method. Accordingly, this study was employed quantitative research approach because it is ideal with identifying trends and averages, making predictions, testing relationships, and generalizing results for large populations. Quantitative research allows the

researcher to generalize the results from a sample group to an entire group of people. Being both structured and statistical, quantitative research provides with the ability to draw conclusions and make an educated decision on a course of action

3.3. The statistical population and sample size

The statistical population is a group of individuals who have one or more common characteristics that we are interested in generalizing our findings to them. In this study, the statistical population is the procurement department and management in Ethio Telecom

The target population used to answer for the planning procurement phase of the study includes 50 staff members who are participated in the planning phase of the Telephone Expansion Program (TEP). It consists Expertise from Network Division, Information System Division and project owner departments of the studied company. The target populations of the study for the remaining process from solicitation planning up to contract closeout were 148 employees who are currently working on Sourcing and Facility Division at headquarter since the company follows centralized procurement system. Information System Transition section has 4 departments with their respective managers who act as both functional and project managers to execute software projects of the Telephone Expansion Program (TEP) became population for the study. Besides to the software part, the execution of hardware aspect of the program fall under the Network PRO section in which its manager was also targeted.

In addition 8 Contract Management Program Managers from TEP are also considered. The target population is relatively small. It is possible to collect and analyze data from every possible case or group member. According to Khotari (2004) a complete enumeration of all items in the 'population' is known as a census inquiry. It can be presumed that in such an inquiry, when all items are covered, no element of chance is left and highest accuracy is obtained. Furthermore the authored emphasized that when the universe is a small one, it is no use resorting to a sample survey. The census method is suitable where the field of investigation is small. The census method is more accurate and reliable. It rules out of the possibility of any personal biases.

3.4.Type and source of data

The research use both primary and secondary data sources. The source of data for the research was more on primary data, which is a survey questionnaire. However, the necessary information and data

also collected through a secondary source, which are a Literature survey, journal, report, government publication, sector documentary, the internet, and other texts.

3.5. Method of Data Collection

To gather data from relevant sources, both primary and secondary data collection instruments were used. The primary data is conducted in the form questionnaire. Data collection had been conducted to construct variables of research model by questioners. This method is chosen in order to get specific information from the respondents. The questionnaires design was developed from a wide review of the literature, which allows measuring most of the analyzed variables. It helps to ensure that the gathered factors are indeed the affecting factors for Ethio Telecom and also to indicate the critical factors of telecommunication network equipment procurement so it can be used to improve.

3.6. Method of data analysis

The identified critical factors was analyzed using Statistical package for social science (SPSS) version 23 so that correlation and regression Analysis. Statistical analysis such as mean and standard deviation was also use. In regression analysis multiple linear regression analysis was used to predict the outcome of a response dependent variable using one or more independent variables. This helps also to understand the linear relation between dependent and independent variables. The model was used to identify the determinants of telecommunication network equipment procurement project. Here, the dependent variable is a continuous variable, and hence, the study used a multiple regression model. The analyzed data was presented in the form of diagrams, charts, and tables by using Statistical package for social science (SPSS) software. Statistical tools such as descriptive arithmetic mean, standard deviation of the factor and correlation used to show the relation and impact of the factors affecting telecommunication network equipment procurement in the case Ethio Telecom.

3.7. Operational definition of study variables

table3. 1 Definition of study variables

LISTOFABBREVIATIONANDACRONYMS

ANOVA	Analysis of Variance
BPR	Business Process Re-engineering
CSF	Critical success factors
FDRE	Federal Democratic Republic of Ethiopia
IT	Information Technology
Network Pro	Network Project Rollout
NGOs	Non-Governmental Organizations
PMBOK	Project Management Body of Knowledge
RFQ	Request for Quotation
SD	Standard Deviation
SPSS	Statistical Package for Social Science
TEP	Telephone Expansion Program
ZTE	Zhong Xing Telecommunication Equipment

table3. 2 Factor Definitions

S.No	Factor	Factor Definition
1	Performance Management	Measuring the performance of equipment is necessary for capability measurement, goals and targets, baseline measurement, key performance indicators (KPI), and progress monitoring.
2	Technology Standard	Technology can contribute to the success of mobile network projects and neglecting these factors may cause problems such as lack of flexibility, synchronization, and local decision-making authority.
3	Price	Business wants quality product at a cheaper rate. Organizations that can supply products at a cheaper rate and good quality stands to gain a good market share.
4	System Integration	the ability of an equipment to integrate with existing systems in real time
5	Top Management Support	Willingness of top management provide the necessary resources authority/power for project success
6	Security	Reliability of equipment is important in ensuring data and hardware is protected.
7	Supplier Process/Time	Delivery time is defined to be the elapsed time from the receipt of an order by the originating supplier in the supply network to the receipt of the product ordered by the final customer in the supply network.
8	relationship with supplier	This relationship enables to have confidence on the supplier based on past performance, technology capability, quality of equipment's etc., and existing contracts binds suppliers to certain conditions as agreed, despite changes in business environment.
9	Change Management	Effectively switch and adopt to the new piece of equipment.
10	Risk	Ability to withstand environmental and other risk factors will also influence the procurement of that equipment
11	Procurement	The process of acquiring goods and services by involving two parties the customer, who is purchasing the item, and the supplier, who is selling it who have distinct goals and interact within a specific market segment.

3.8. Model specification

$$Y = \beta_0 + \beta_1 \mathrm{PP} + \beta_2 \mathrm{TS} + \beta_3 \mathrm{P} + \beta_4 \mathrm{SI} + \beta_5 \mathrm{TMS} + \beta_6 \mathrm{S} + \beta_7 \mathrm{SPT} + \beta_8 \mathrm{CM} + \beta_9 \mathrm{RWS} + \beta_{10} \mathrm{R} + \varepsilon$$

Where PP is Performance Management, TS is Technology Standard, P is Price, SI is System Integration, TMS is Top Management Support, S is Security , SPT is Supplier Process/Time, CM is Change Management, RWS is Relationship with supplier, R is Risk, β_0-β_{10}= the Coefficients of the independent variable.

3.9. Reliability and Validity

3.9.1. Reliability

Reliability refers to the extent to which your data collection techniques or analysis procedures will yield consistent findings. It can be assessed by posing the following three questions (Easter by-Smith et al. 2008:109):

1. Will the measures yield the same results on other occasions?
2. Will similar observations be reached by other observers?
3. Is there transparency in how sense was made from the raw data?

Validity is concerned with whether the findings are really about what they appear to be about. Is the relationship between two variables a causal relationship?

In this thesis, tests of reliability were done. The reliability of instruments measures the consistency of instruments (Yallew, 2004).The reliability of a scale indicates how free it is from random error (Pallant, 2015). The most commonly used statistic for internal consistency is Cronbach's coefficient alpha. This statistic provides an indication of the average correlation among all of the items that make up the scale. Values range from 0 to 1, with higher values indicating greater reliability (Pallant, 2005; Yallew, 2004). While different levels of reliability are required, depending on the nature and purpose of the scale, by citing Nunnally (1978) Pallant (2011) recommends a minimum level of 0.7. Yalew (2004) adds that it is good cronbach alpha not to be below 0.65. In the same vein as rule of thumb, George et al (2003) as cited in .Habtamu (2016), suggested that tests with reliability coefficient 0.90 and above labeled as excellent reliability, those between 0.80-0.90 labeled as good, those between 0.70-0.80 labeled as acceptable, those between 0.60-0.70 as questionable and therefore needs to be supplemented by other measures to determine scales, those between 0.50-0.60 as poor and needs revision of test and those below 0.5 as an unacceptable.

Thus, in this thesis the reliability of the scale were gauged through SPSS version 23 via Cronbach's coefficient alpha. It was displayed in the table 3 bellow.

table3. 3The Cronbach's Alpha Values of All Independents and Dependent Variables/ Reliability Statistics

Variables	N Items	Cronbach's Alpha	Evaluation of Scale Consistency
Successful procurement	16	0.831	Good
Performance Management	2	0.894	Good
Technology Standard	2	0.826	Good
Price	2	0.706	Acceptable
System Integration	2	0.861	Good
Top Management Support	2	0.898	Good
Security	2	0.813	Good
Supplier Process/Time	2	0.765	Acceptable
Change Management	2	0.886	Good
Relationship with supplier	2	0.762	Acceptable
Risk	2	0.798	Acceptable

Sources: SPSS Output From Field Survey, 2023.

As the above table the Cronbach's coefficient alpha value shows, for five point like rt scale items, used for dependent and independent variable is 0.821 which is for all variables it is above the threshold 0.7. This shows Appropriateness of instruments used. And all the items in the instruments were used and the result shows the reliability of the research is adequate.

3.9.2. Validity

According to Pallant (2005) the validity of a scale refers to the degree to which it measures what it is supposed to measure. For Creswell (2014) validity in quantitative research refers to whether one can draw meaningful and useful inferences from scores on particular instruments. Though there is no one clear-cut indicator of a scale's validity, the validation of a scale involves the collection of empirical evidence concerning its use. The main types of validity are content validity and construct validity (Creswell, 2014:Pallant, 2005). Content validity refers to the adequacy with which a measure or

scale has sampled from the intended universe or domain of content. Construct validity involves testing a scale not against a single criterion but in terms of theoretically derived hypotheses concerning the nature of the underlying variable or construct. The construct validity is explored by investigating its relationship with other constructs, both related (convergent validity) and unrelated (discriminant validity) (Creswell, 2014: Pallant, 2005).

Therefore, in this thesis validity of the scale were checked as follow. To establish content validity initially 31 item questionnaires were presented to this thesis advisor. A through and a detail discussion were made about the importance and relevance of each constructs. Following it 5 items are incorporated a total of 36 items. These items which are basically focused on all the explanatory and explained variables were prepared to be distributed to the pilot test groups. Through convenient sampling pilot tests were used to survey from 9 managers and employee. Feedbacks from these respondents provide guidance to correct the wording problems and a proper modification were made. Therefore, prior to actual data collection, instrumentation validation was performed to verify that the constructs are likely real, reliable and more importantly that instrument has been measuring the right content which means adequately represents the universe of potential questions that could be used to measure a specific concept.

3.9. Ethical Consideration

The researcher clearly explains the purpose of the study to the participants before data gathering. The data was collected with the full consent of the participants. The researcher also secured the informed consent of the participants before collecting the data and ensured that confidentiality concerns are considered following data collection. The confidentiality was verbally indicated at the time of data collection in that the data was only used for the intended purpose of this study. In addition to this, the researcher informed participants not to tell their names on during interviews to keep their level of confidence and trust and also secure genuine data.An official support letter from St. Marry University was written to Ethio Telecom. Data collection was undertaken after permission has been obtained from the company. Since it could not be ethical to access some confidential documents of the company, the organization code of ethics also considered. All the collected data are confidential for both the participants and the company. All documents which are referred throughout the research are fully acknowledged

Chapter Four
Data Presentation Analysis and Discussion

Introduction

This chapter presents the data collected and the analysis carried out based on the methodology described in chapter three. The results are presented below starting with the demography of the participants then moving on to descriptive analysis of procurement process of Ethio-telecom and finally correlation and regression analysis of the elements of successful procurement and its overall success as rated by the participants.

4.1. Descriptive Data Analysis

In this section the measure of central tendency and dispersion were presented from the collected data.

4.1.1. General Characteristics of the Respondents

The respondent's profile who participated in this thesis was mainly shows distribution of respondents in terms of gender, age, gender, education level, experience and position

table 4. 1Demographic characteristics of the respondents

Item	Category	Frequency	Per cent
Age	18-34	23	32.8
	35-60	37	52.85
	60 and above	10	14.2
	Total	70	100.0
Educational Status	Diploma	9	12.8
	Degree	50	71.42
	Postgraduates	11	15.71
	above	0	0
	Total	70	100.0
Year of experience	Less than 5 years	9	12.85
	5-10 years	30	42.85
	11-15years	27	38.57
	15 and above years	4	5.7
	Total	70	100.0
Working position	Supervisor	6	8.5
	Expert	9	12.85
	Specialist	20	28.57
	Administrator	35	50
	Total	70	100

Sources: SPSS Output from Field Survey, 2023

The Table above shows distribution of respondents in terms of age, education level, experience and position. In terms of age, out of a total of 70 who reported their age, those between 35-60 years old

were the largest group 52.85%, followed by 18-34 years 32.8%, above 60 years with 10 14.2%. This indicates the company has active, matured and has potential man power.

The education background of the participants showed that bachelor's degree level education was the significant majority 74.12%. Educational qualifications of post graduates 11.71% and diploma 12.8% were also observed. Therefore, the majority of the respondents pass through formal education so they can understand about the subject matter.

Looking at the year of experience of the participants in the industry, the most frequent year of service for participants was between 5-10 years 42.85% of the participants. This was followed by those with between 11-15 years' experience 38.57% and those with less than 5 years of experience 12.85%. There were 5.7% with experience of more than 15 years. this shows the respondents can understand the process of the study area and respond for the questionnaire clearly.

Looking at the participants' position 8.5%is Supervisor, Expert 12.85%, and Specialist 28.57% and 50% administrative. These shows the information is taken from the person who could experience the subject matter.

From the above information the researcher accredited respondents' qualifications, experiences and positions that allow them to knowledgeably and reasonably put their extent of agreement, so that, it has positive contribution on the validity of the study.

4.2 Descriptive Analysis of procurement processes

4.2. Understanding procurement process

table 4. 2 Understanding procurement process

Items	category	frequency	per cent
Make-or-buy analysis is made before deciding to buy from outside vendors.	Strongly disagree	0	0
	Disagree	5	7.14
	Uncertain	10	14.28
	Agree	40	57.14
	Strongly Agree	15	21.42
	total	70	100
Market research is conducted.	Strongly disagree	3	4.2
	Disagree	9	12.85
	Uncertain	10	14.28
	Agree	30	42.85
	Strongly Agree	18	25.71
	total	70	100
There is consideration of past procurement documents for making future decision	Strongly disagree	2	2.85
	Disagree	9	12.85
	Uncertain	11	15.71
	Agree	10	14.25
	Strongly Agree	38	54.28
	total	70	100
The prepared document (RFP&RFI) helps to get accurate, relevant and complete information from suppliers.	Strongly disagree	2	2.85
	Disagree	1	1.42
	Uncertain	11	15.71
	Agree	22	31.42
	Strongly Agree	34	48.57
	total	70	100
Pre proposal visits is arranged	Strongly disagree	10	14.28
	Disagree	36	51.42
	Uncertain	11	15.71
	Agree	9	12.85
	Strongly Agree	4	5.71
	total	70	100
The company use bidders' conference/pre-bid meeting to give answer for the asked questions and doubts to all prospective suppliers.	Strongly disagree	8	11.42
	Disagree	4	5.71
	Uncertain	8	11.42
	Agree	30	42.85
	Strongly Agree	20	28.57
	total	70	100

Source: own Survey (2023)

Table 4.2: indicates the respondent's perception about Make-or-buy analysis is made before deciding to buy from outside vendors. According to the table out of the total respondents, 7.14 % disagree, 14.28 uncertain, 57.14% agree and the remaining 21.42% agree that there is consideration make-or-buy analysis before deciding to buy from outside vendors to meet the project procurement need of the company. The respondent's perception about conducting market research indicates, out of the whole respondents 4.2% strongly disagree, 12.85 disagree, 14.28% uncertain, 42.85% agree and 25.71%

strongly agree about conducting market research. Form observation the company also collect information about suppliers and their products online on its official website. New suppliers both from local and foreign market register and update their information accordingly. Depicts that more than half of the respondents (54.28%) strongly agree that consideration of past project procurement documents for making future decision while the remaining 12.85% disagree, 15.71% uncertain and 14.25% agree. Such reference helps to identify possible threats and opportunities as well as learn from past mistakes for making better decision.

The respondent's perception prepared document (RFP&RFI) that helps to get accurate, relevant and complete information from suppliers indicates ,out of the whole respondents 2.85% strongly disagree, 1.42 disagree, 15.71% uncertain, 31.42% agree and 48.57% strongly agree. About the information gathered from RFP & RFI documents helps to get accurate, relevant and complete information. From this point, it can be concluded that the prepared procurement documents helps to obtain accurate, relevant and complete information from suppliers. The respondent's perception Pre-proposal visits is arranged ,out of the whole respondents 14.28% strongly disagree, 51.42 disagree, 15.71% uncertain, 12.85% agree and 5.71% strongly agree. The company fails to conduct Pre-proposal market visit. The respondent's perception Usage of bidders' conference for answering prospective suppliers' questions is arranged, out of the whole respondents 11.42% strongly disagree, 5.71 disagree, 11.42% uncertain, 42.85% agree and 28.57% strongly agree on the use of bidders' conference/pre-bid meeting to give answer for the asked questions and doubts to all prospective sellers.

table 4. 3Understanding procurement process

Items	category	frequency	per cent
The company respond for questions and doubts raised by prospective sellers individually.	Strongly disagree	1	1.42
	Disagree	1	1.42
	Uncertain	3	4.28
	Agree	30	42.85
	Strongly Agree	35	50
	total	70	100
There is standardizing pre-defined proposal evaluation criteria.	Strongly disagree	2	2.8
	Disagree	3	4.28
	Uncertain	4	5.71
	Agree	28	40
	Strongly Agree	33	47.14
	total	70	100
Preliminary screening is used before making detail evaluation of proposal.	Strongly disagree	3	4.28
	Disagree	3	4.28
	Uncertain	4	5.71
	Agree	27	38.57
	Strongly Agree	33	47.14
	total	70	100
The terms and conditions of the contract are open to consider future requirement change (the contract is open for amendment).	Strongly disagree	3	4.28
	Disagree	2	2.85
	Uncertain	3	4.28
	Agree	28	40
	Strongly Agree	34	48.57
	total	70	100
The companies monitor and control that suppliers' performance meets project procurement requirements according to terms of the contract.	Strongly disagree	4	7.1
	Disagree	3	4.2
	Uncertain	5	7.14
	Agree	26	37.14
	Strongly Agree	32	45.71
	total	70	100
Suppliers' performance status is gathered from stakeholders such as project managers and project team members.	Strongly disagree	36	51.42
	Disagree	27	38.57
	Uncertain	2	2.85
	Agree	2	2.85
	Strongly Agree	3	4.2
	total	70	100
Suppliers' performance status is gathered from stakeholders such as project managers and project team members.	Strongly disagree	3	4.28
	Disagree	7	10
	Uncertain	8	11.42
	Agree	22	31.42
	Strongly Agree	30	42.85
	total	70	100
There is lesson learned documentation	Strongly disagree	5	7.14
	Disagree	7	10
	Uncertain	10	14.28
	Agree	8	11.42
	Strongly Agree	40	57.14
	total	70	100

Source: own Survey (2023)

As indicated in Table 4.3 the respondent's perception Respond for questions and doubts raised by prospective suppliers individually is arranged, out of the whole respondents 1.42% strongly disagree, 1.42 disagree, 4.28% uncertain, 42.85% agree and 50% strongly agree on Respond for questions and doubts raised by prospective suppliers individually. The respondent's perception the presence of standardize predefined proposal evaluation criteria is arranged ,out of the whole respondents 2.8% strongly disagree, 4.28 disagree, 5.71% uncertain, 40% agree and 47.14% strongly agreeon Respond for questions and doubts raised by prospective suppliers individually. The researcher has supported the above responses by referring project management process document of the company. The respondent's perception Preliminary screening used before making detail evaluation of proposal is arranged ,out of the whole respondents 4.28% strongly disagree, 4.28% disagree, 5.71% uncertain, 38.57% agree and 47.14% strongly agree on the company conduct preliminary screening before making detail evaluation of proposal. The respondent's perception Preliminary screening used before making detail evaluation of proposal is arranged ,out of the whole respondents 4.28% strongly disagree, 2.85% disagree, 4.28% uncertain, 40% agree and 48.57% strongly agree on the issue. Most of the respondents agree that the terms and conditions of the contract are open to consider future requirement change. The respondent's perception Preliminary screening used before making detail evaluation of proposal is arranged ,out of the whole respondents 7.1% strongly disagree, 4.2 disagree, 7.14% uncertain, 37.14% agree and 45.71% strongly agree on that the company monitor and control if suppliers performance meets project procurement requirements according to terms of the contract.

The respondent's perception Vendors' performance status is gathered from stakeholders such as project managers and project team members ,out of the whole respondents 38.57% strongly disagree, 51.42% disagree, 2.85% uncertain, 4.2% agree and 2.85% strongly agree the respondent doesn't agree on performance status gathered from the concerned stakeholder. The respondent's perception Identification of contract closeout activities, out of the whole respondents 4.28% strongly disagree, 10% disagree, 11.42% uncertain, 31.42% agree and 42.85% strongly agree on the issue. The respondent's perception Lesson learned documentation, out of the whole respondents 7.14% strongly disagree, 10% disagree, 14.28% uncertain, 11.42% agree and 57.14% strongly agree on the issue. According to data collected from the company reveals that there is documentation of lesson leaned after each projects are completed and compiled centrally for program report at large.

table 4. 4. Preliminary screening used before making detail evaluation of proposal

Items	category	frequency	per cent
Financial stability	Strongly disagree	3	4.28
	Disagree	3	4.28
	Uncertain	5	7.14
	Agree	23	32.85
	Strongly Agree	37	52.85
	total	70	100
Technical requirement	Strongly disagree	2	2.85
	Disagree	3	4.28
	Uncertain	4	5.714
	Agree	20	28.57
	Strongly Agree	42	60
	total	70	100
Risk management issue	Strongly disagree	10	14.28
	Disagree	32	45.71
	Uncertain	10	14.28
	Agree	11	15.71
	Strongly Agree	7	10
	total	70	100
Past experience	Strongly disagree	1	1.42
	Disagree	2	2.85
	Uncertain	2	2.85
	Agree	27	38.57
	Strongly Agree	38	54.28
	total	70	100

Source: own Survey (2023)

As indicated in Table 4.4 the respondent's perception Preliminary screening used before making detail evaluation of proposal consideration of financial stability, technical requirement, risk management issue and past experience to evaluate and select among suppliers'.4.28% strongly disagree, 4.28% disagree, 7.14% uncertain, 32.85% agree and the remaining 52.85% strongly agree about consideration of financial stability while selecting among suppliers'.

As indicated in Table 4.11.2.85% strongly disagree, 4.28% disagree, 5.71% uncertain, 28.57% agree and the remaining 60% strongly agree about consideration of technical requirement for evaluating and selecting among suppliers proposal. The above table also depicts that, 14.28% strongly disagree, 45.71% disagree, 14.28% uncertain, 15.71% agree and the remaining 10% strongly agree about consideration of risk management issue for selecting among proposals. The result shows that the company is not considering the risk management process of suppliers.

From table 4.11, more than half of the respondents (54.28%) strongly agree that the company considered past experience of suppliers for selecting among the received proposals. The remaining 1.42% strongly disagrees, 2.85% disagree, 2.85% uncertain and 38.57% agrees of the issue. There is reference of past performance document for suppliers which are previously work with the company.

4.2.2. Descriptive Analysis of the Independent Variables

While making interpretation of the results of mean and standard deviation the scales were reassigned as follows to make the interpretation easy and clear (Al-Sayaad, Rabea, &Samrah, 2006) as cited by Bassam (2013).

table 4. 5. Five Scaled Likert Criterion

Scale	Mean range	Response option
1	1-1.8	Strongly Disagree
2	1.8-2.6	Disagree
3	2.6-3.4	Neutral
4	3.4-4.2	Agree
5	4.2-5	Strongly Agree

Source: Al-Sayaad et al. (2006) as cited by Bassam (2013).

table 4. 6 Descriptive statistics of independent variables

	N	Mean	Std. Deviation
Performance Management	70	2.2940	.81486
Technology Standard	70	2.0569	.88427
Price	70	2.1390	1.09237
System Integration	70	1.0284	.66307
Top Management Support	70	2.4787	.76929
Security	70	2.5012	.84463
Supplier Process/Time	70	2.2564	.8641
Change Management	70	2.5641	.8548
Relationship with supplier	70	2.3542	.8642
Risk	70	2.3652	.8954

Source: Calculated from Survey (2023)

In general the above analysis indicates that the selected procurement success influencing variables (Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, and Relationship with supplier) are indeed the factors for Ethio-Telecom successful procurement practices also. The majority of the participants respond they have a lack of these variables.

4.3. Inferential Statistics

The main aim of this thesis is to examine the factors affecting telecommunication network procurement in the case of Ethio- Telecom.

To this end, ten independent variables were identified as determinants of successful procurement practice based on theoretical and empirical review of relevant and extant literatures. In this section, the correlation and multiple linear regression analysis were presented as follow.

4.3.1. Correlation Analysis

Correlation analysis is used to describe the strength and direction of the linear relationship between two variables (Pallant, 2013). A correlation coefficient enables to quantify the strength of the linear relationship between two ranked or numerical variables.

Pearson correlation was calculated to see the relationship between the dependent variable successful procurement and the independent variables Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, Relationship with supplier. The value of r can take on any value between 1 and 1(Pallant, 2013.) A value of r=+1 implies a perfect positive relationship, whereas r=-1 holds the reverse value which is a perfectly negative correlations. According to Saunders, Lewis and Thornhill (2009) correlation coefficients between-1 and 1 represent weaker positive and negative correlations, a value of 0 meaning the variables are perfectly independent. According to Cohen(1988) as mentioned by Pallant(2013) irrespective of the minus signs for the rest of the value r=0.10-0.29 leveled as small correlation, for r= 0.30-0.49 medium correlation and for r ≥50 is a large correlation coefficient. Throughout the interpretation of the correlation coefficient this category were applied.

As can be seen from Table below, all the independent variables showed positive correlation with the dependent variable. In their order of strength of relationship 'Change Management was strongly correlated to successful procurement with Pearson correlation coefficient (r (70) = 0.895, p< .01), followed by 'Performance Management' with r (70) = 0.845, p< .01. Third was 'System Integration' with r (70) = 0.785, p< .01, fourth was 'Technology Standard' with r (70) =0.753, p< .01, fifth were 'Price' with r (70) = 0.752, p< .01 sixth was 'Top Management Support' with r (70) = 0.743, p< .01, seventh 'Risk' had positive relationship r (70) = 0.692, p< .01 eighth 'Security' had positive relationship r (70) = 0.685, p< .01, ninth 'Supplier Process/Time' had positive relationship r (70) = 0.658, p< .01 and 'Relationship with supplier' had positive relationship r (70) = 0.641, p< .01

table 4. 7 Correlation Analysis between Dependent and independent variables

		SP	PM	TS	P	SI	TMS	S	SPT	CM	RWS	R
	Pearson Correlation	1										
	Sig. (2-tailed)											
SP	N	70										
	Pearson Correlation	0.845	1									
	Sig. (2-tailed)	0										
PM	N	70	70									
	Pearson Correlation	0.753	. 531	1								
	Sig. (2-tailed)	0.001	0									
TS	N	70	70	70								
	Pearson Correlation	0.752	. 535	0.209	1							
	Sig. (2-tailed)	0	0	0.002								
P	N	70	70	70	70							
	Pearson Correlation	0.785	0.747	0.379	0.557	1						
	Sig. (2-tailed)	0	0	0	0							
SI	N	70	70	70	70	70						
	Pearson Correlation	0.743	. 559	0.272	0.339	0.456	1					
	Sig. (2-tailed)	0	0	0	0	0						
TMS	N	70	70	70	70	70	70					
	Pearson Correlation	0.685	. 380	0.181	0.174	0.247	0.189	1				
	Sig. (2-tailed)	0	0	0.008	0.011	0	0.006					
S	N	70	70	70	70	70	70	70				
	Pearson Correlation	0.658	. 322	0.184	-0.012	0.238	0.1	0.228	1			
	Sig. (2-tailed)	0	0	0.007	0.867	0	0.146	0.001				
SPT	N	70	70	70	70	70	70	70	70			
	Pearson Correlation	0.895	. 344	0.196	0.095	0.229	0.183	0.114	0.303	1		
	Sig. (2-tailed)	0	0	0.004	0.171	0.001	0.008	0.098	0			
CM	N	70	70	70	70	70	70	70	70	70		
	Pearson Correlation	0.641	0.535	0.568	0.485	0.458	0.145	0.359	0.145	0.485	1	
	Sig. (2-tailed)	0	0	0.001	0	0	0.001	0.005	0.005	0.001		
RWS	N	70	70	70	70	70	70	70	70	70	70	
	Pearson Correlation	0.692	0.563	0.475	0.758	0.652	0.458	0.354	0.152	0.684	0.752	1
	Sig. (2-tailed)	0	0	0.001	0.005	0.002	0.003	0.004	0.001	0.003	0.004	
R	N	70	70	70	70	70	70	70	70	70	70	70
	**. Correlation is significant at the 0.01 level (2-tailed).											

Sources: SPSS Output, from Field Survey, 2023

4.3.1.1. Correlation Analysis between Change Management and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Change Management (CM) and the dependent variable, Successful procurement (SP). The coefficient is 0.895. This coefficient shows that there is a high and positive relationship between Change Management and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.7 indicates that, a high positive relation is found between Change Management and Successful procurement ($r = 0.895$, $p < .01$), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of change management associated with high level of Successful procurement. Kejuo (2012) also agreed on this finding.

4.3.1.2. Correlation Analysis between Performance Management and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Performance Management and the dependent variable, Successful procurement (SP). The coefficient is 0.845. This coefficient shows that there is a high and positive relationship between Performance Management and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Performance Management and Successful procurement ($r = 0.845$, $p < .01$), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Performance Management associated with high level of Successful procurement. Scholars like Mehmood (2019),Kejuo (2012) also agreed on the above finding.

4.3.1.3. Correlation Analysis between System Integration and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. System Integration and the dependent variable, Successful procurement (SP). The coefficient is 0.785. This coefficient shows that there is a high and positive relationship between System Integration and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive

relation is found between System Integration and Successful procurement (r =0.785, p < .01), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of System Integration associated with high level of Successful procurement. Scholars like DOF (2001), Birks et. al (2001), S&A (2003), Subramanian and Shaw (2002) Mehmood (2019), Kejuo (2012)also agreed on the issue.

4.3.1.4. Correlation Analysis Between Technology Standard and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Technology Standard and the dependent variable, Successful procurement (SP). The coefficient is 0.785. This coefficient shows that there is a high and positive relationship between Technology Standard and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Technology Standard and Successful procurement (r =0.785, p < .01), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Technology Standard associated with high level of Successful procurement. Previous study Mehmood (2019), Kejuo (2012)and Khanapuri At El (2011) also agreed on this findings.

4.3.1.5. Correlation Analysis between Price and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Price and the dependent variable, Successful procurement (SP). The coefficient is 0.752. This coefficient shows that there is a high and positive relationship between Price and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Price and Successful procurement (r =0.752, p < .01), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Price associated with high level of Successful procurement. Mehmood (2019), Kejuo (2012) and Khanapuri At El (2011) are scholars who agree on this finding.

4.3.1.6. Correlation Analysis Between Top Management Support and successful procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Top Management Support and the dependent variable, Successful procurement (SP). The coefficient is 0.743. This coefficient shows that there is a high and positive relationship between Top Management Support and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Top Management Support and Successful procurement ($r = 0.743$, $p < .01$), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Top Management Support associated with high level of Successful procurement. According to S&A (2003), AGV (2003), OGC (2002), CGEC (2002), AOT (2003) Kejuo (2012), Mehmood (2019) the finding is correct.

4.3.1.7. Correlation Analysis Between Risk and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Risk and the dependent variable, Successful procurement (SP). The coefficient is 0.692. This coefficient shows that there is a high and positive relationship between Risk and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Risk and Successful procurement ($r = 0.692$, $p < .01$), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Risk associated with high level of Successful procurement. Scholars Kejuo (2012) and Mehmood (2019)are agreed on the findings.

4.3.1.8. Correlation Analysis between Security and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Security and the dependent variable, Successful procurement (SP). The coefficient is 0.685. This coefficient shows that there is a high and positive relationship between Security and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found

between Security and Successful procurement (r =0.685, p < .01), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Security associated with high level of Successful procurement. Kejuo (2012) and Mehmood (2019)also agreed.

4.3.1.9. Correlation Analysis between Supplier Process/Time and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of association between the independent variable i.e. Supplier Process/Time and the dependent variable, Successful procurement (SP). The coefficient is 0.658. This coefficient shows that there is a high and positive relationship between Supplier Process/Time and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Risk and Successful procurement (r =0.658, p < .01), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Supplier Process/Time associated with high level of Successful procurement. Mehmood (2019), Kejuo (2012) and Khanapuri At El (2011) also agreed on this findings.

4.3.1.10.Correlation Analysis between Relationship with supplier and Successful Procurement

Pearson correlation test was conducted to see the strength and direction of associationbetween the independent variable i.e. Relationship with supplier and the dependent variable, Successful procurement (SP). The coefficient is 0.641. This coefficient shows that there is a high and positive relationship between Relationship with supplier and Successful procurement. The (**) highlights that the probability of this correlation coefficient occurring by chance alone is less than 0.01.(1 per cent). This correlation coefficient is therefore statistically significant. Perusal table 4.19 indicates that, a high positive relation is found between Risk and Successful procurement (r =0.641, p < .01), which is statistically significant at 99% confidence level or 1% significance level, with high level of availability of Relationship with supplier associated with high level of Successful procurement. Jefferies et al. (2002) Kopp (1997) ,Gentry and Fernandez (1997) , Arthur Andersen and Enterprise LSE (2000),Mehmood (2019), Kejuo (2012)mentioned this factor.

4.3.2. Multiple linear regression analysis

4.3.2.1. Assumption of Multiple Linear Regressions

Multiple linear regressions have its' own assumptions. Normality, Linearity, homo scedasticity, no outlier, no collinearityor multicollinearity, (Pallant, 2005; Saunders et al., 2009; Tabachnick&Fidell, 2013) are some of the assumptions. According to Pallant (2005) the assumption of the multiple linear regressions is rigid. Let see each in brief with the detection mechanisms.

Collinearityor Multicollinearity

According to Pallant (2005) multi collinearity refers to the relationship among the independent variables. Multi collinearity exists when the independent variables are highly correlated (r=.9 and above). Thus it can be diagnostic from the correlation coefficients (Saunders et al., 2009) this has been observed from the correlation matrix and there was no correlation closer to 0.9. It can be also known through the variance inflation factors and tolerance value. A very small tolerance value (0.10 or below) or a large VIF value (10 or above) indicates high co linearity. If Multi-collenerity happen the best remedy will be to delete the highly correlated variables among the given IV on logical rather than statistical grounds by considering issues such as the reliability of the variables or the cost of measuring the variables((Tabachnick&

table 4. 8 *Collinearity Statistics*

Variables	Collinearity Statistics	
		VIF
Performance Management	0.824	1.214
Technology Standard	0.656	1.5295
Price	0.527	1.899
System Integration	0.76	1.316
Top Management Support	0.892	1.121
Security	0.819	1.221
Supplier Process/Time	0.867	1.153
Change Management	0.896	1.265
Relationship with supplier	0.752	1.325
Risk	0.585	1.582

Sources: SPSS Output from Field Survey, 2023.

As the anecdotal data above in table 3 depict for all variables the tolerance values were above the minimum cut point 0.01. The minimum values were observed for the variable price which is 0.527 which is quite larger than the minimum threshold value 0.01. The VIF values for all variables were also below the maximum cut point 10. The maximum were observed for the variable price which is 1.899 which is far from the cut point 10. Therefore, in this data there is no a problem of multi collinearity among the variables. Hence, inferring from this a conclusion worth's important.

A standard multiple regression analysis was conducted to evaluate how well the different elements of the successful procurement particularly Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, Relationship with supplier and risk determined Successful Procurement

table 4. 9 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.861[a]	.740	.732	2.121

a. Predictors: (Constant), Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, Relationship with supplier, Risk

Sources: SPSS Output, from Field Survey, 2023

Perusal of the model Summery table 4.21 above shows the value of R Square, which is 0.740 expressed as percentage (74%). This value is large and shows the adequacy of the model. Therefore, this entails that 74%, of the variance in the dependent variable which means successful procurement is explained by the model which includes Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, and Relationship with supplier. The remaining 26 % of the variance is explained by other variables not included in this study. To assess the statistical significance of the result it is necessary to look in the table labeled ANOVA (Pallant, 2013). If Sig. 0.000<0.05, the model fits the data.

table 4. 10 Model Fitness ANOVA Analysis

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2605.197	10	372.171	82.737	.000
	Residual	913.144	203	4.498		
	Total	3518.341	210	372.171	82.737	.000

a. Dependent Variable: SP

b. Predictors: (Constant), Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, Relationship with supplier, Risk

Sources: SPSS Output From Field Survey, 2023.

Perusal of table 4.22 the F-test result was 82.737 with significance ('Sig.') of .000. This means that the probability of these results occurring by chance was less than 0.0005, indicates that the model reaches statistical significance (Sig = .000, this really means p<.0005). This implies that the model is adequate (fit) and is worth maintaining.

4.3.2.1. Evaluating each of the independent variables

So far, the descriptive and the correlation analysis were made. The assumptions of multiple linear regressions were checked and the model was adequate. With this result of test of model adequacy ("Model Summary" table and an "ANOVA" table) therefore, the contribution of each variables in explaining or influencing the dependent variable were presented and discussed.

table 4. 11un standardized and standardized coefficients

Model		Un standardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-5.595	1.144		4.478	.000
	Performance Management	.349	.061	.226	5.747	.000
	Technology Standard	.223	.059	.168	3.801	.000
	Price	.472	.060	.389	7.900	.000
	System Integration	.226	.045	.0206	5.033	.000
	Top Management Support	.174	.048	.139	3.669	.000
	Security	.161	.061	.104	2.637	.000
	Supplier Process/Time	.138	.048	.110	2.871	.005
	Change Management	.152	.025	.115	2.856	.000
	Relationship with supplier	.145	.048	.123	2.654	.000
	Risk	.159	.078	.130	2.856	.000

a. Dependent Variable: SP

Sources: SPSS Output, from Field Survey, 2023

As it is revealed in table 4.23 above coefficient consists of the Un standardized Coefficients (B) and Standardized Coefficients (Beta) are presented. According to Pallant (2005) in constructing a regression equation, un standardized coefficient values listed as B is useful. To compare the different variables the standardized coefficients is important. All parameters are statistically significant since their P-value is less than 0.05. In other words, the probability of all these results occurring by chance is less than 0.05, being less than 0.001 for all the independent variable except for the variable Technology Trajectory which is significant at 5% significance level. The authors also extend that it can be used to predict the values of a dependent variable given the values of one or more independent variables by calculating a regression equation.

Therefore, the equation is written as follows using the Unstandardized Coefficient B.

$$Y = \beta_0 + \beta_1 \mathrm{PP} + \beta_2 \mathrm{TS} + \beta_3 \mathrm{P} + \beta_4 \mathrm{SI} + \beta_5 \mathrm{TMS} + \beta_6 \mathrm{S} + \beta_7 \mathrm{SPT} + \beta_8 \mathrm{CM} + \beta_9 \mathrm{RWS} + \beta_{10} \mathrm{R} + \varepsilon$$

Where PP is Performance Management, TS is Technology Standard, P is Price, SI is System Integration, TMS is Top Management Support, S is Security , SPT is Supplier Process/Time, CM is Change Management, RWS is Relationship with supplier, R is Risk, β_0-β_{10}= the Coefficients of the independent variable.

Thus, as far as the coefficient of each independent variables including the constant were known the equation is written as follows:

$$\text{successfulprocurement} = \beta_0 + 0.349\,\text{PP} + 0.223\,\text{TS} + 0.472\text{P} + 0.226\,\text{SI} + 0.174\text{TMS} + 0.161\text{S} + 0.138\text{SPT} + 0.152\text{CM} + 0.145\text{RWS} + 0.159\text{R} + \varepsilon$$

Based on this analysis, the impact of each explanatory (independent variable) on response variable (dependent variable) will be explained in detail as follows

4.3.1.1.1. The Effect of Performance Management on Successful procurement

Perusal table indicates that personal attitude towards Performance Management has unstandardized coefficient B of 0.349 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Performance Management would lead to a 0.349 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Performance Management has a statistically significant and a positive effect (β=0.349, p<0.01) on successful procurement. Scholars like Mehmood (2019),Kejuo (2012) also agreed on the above finding.

4.3.1.1.2. The Effect of Technology Standardon Technological capability

Perusal table indicates that personal attitude towards Technology Standard has un standardized coefficient B of 0.223 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Technology Standard would lead to a 0.223 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Technology Standard has a statistically significant and a positive effect (β=0.223, p<0.01) on successful

procurement. Previous study Mehmood (2019), Kejuo (2012) and Khanapuri At El (2011) also agreed on this findings.

4.3.1.1.3. The Effect of Price on successful procurement

Perusal table indicates that personal attitude towards Price has un standardized coefficient B of 0.472 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Price would lead to a 0.472 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Price has a statistically significant and a positive effect(β=0.472, p<0.01) on successful procurement. Mehmood (2019), Kejuo (2012) and Khanapuri At El (2011) are scholars who agree on this finding.

4.3.1.1.4. The Effect of System Integration on successful procurement

Perusal table indicates that personal attitude towards System Integration has unstandardized coefficient B of 0.226 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in System Integration would lead to a 0.226 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable System Integration has a statistically significant and a positive effect (β=0.226 , p<0.01) on successful procurement.Scholares like DOF (2001), Birks et. al (2001), S&A (2003), Subramanian and Shaw (2002) Mehmood (2019), Kejuo (2012)also agreed on the issue.

4.3.1.1.5. The Effect of Top Management Support on successful procurement

Perusal table indicates that personal attitude towards Top Management Support has un standardized coefficient B of 0.174 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Top Management Support would lead to a 0.174 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Top Management Support has a statistically significant and a positive effect (β=0.174, p<0.01) on

successful procurement. According to S&A (2003), AGV (2003), OGC (2002), CGEC (2002), AOT (2003) Kejuo (2012), Mehmood (2019) the finding is correct.

4.3.1.1.6. The Effect of Security on Successful Procurement

Perusal table indicates that personal attitude towards Security has un standardized coefficient B of 0.161 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Security would lead to a 0.161 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Security has a statistically significant and a positive effect (β=0.161, p<0.01) on successful procurement.Kejuo (2012) and Mehmood (2019) also agreed.

4.3.1.1.7. The Effect of Supplier Process/Time on Successful Procurement

Perusal table indicates that personal attitude towards Supplier Process/Time has un standardized coefficient B of 0.138 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Supplier Process/Time would lead to a 0.138 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Supplier Process/Time has a statistically significant and a positive effect (β=0.138, p<0.01) on successful procurement. Mehmood (2019), Kejuo (2012) and Khanapuri At El (2011) also agreed on this findings.

4.3.1.8.The Effect of Change Managementon Successful Procurement

Perusal table indicates that personal attitude towards Change Management has un standardized coefficient B of 0.152 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Change Management would lead to a 0.152 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Change Management has a statistically significant and a positive effect (β=0.152, p<0.01) on successful procurement. Kejuo (2012) also agreed on this finding.

4.3.1.9.The Effect of Relationship with supplier on Successful Procurement

Perusal table indicates that personal attitude towards Relationship with supplier has un standardized coefficient B of 0.145 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Relationship with supplier would lead to a 0.145 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Relationship with supplier has a statistically significant and a positive effect (β=0.145, p<0.01) on successful procurement. Jefferies et al. (2002) Kopp (1997) ,Gentry and Fernandez (1997) , Arthur Andersen and Enterprise LSE (2000), Mehmood (2019), Kejuo (2012) mentioned this factor.

4.3.1.10. The Effect of Risk on Successful Procurement

Perusal table indicates that personal attitude towards Risk has un standardized coefficient B of 0.159 with Sig. value (0.000) which means that the probability of this results occurring by chance is less than 0.01. In other words, the regression coefficients for the variables is positive and statistically significant at the p <0.01 level. To elaborate more, a one-unit change in Risk would lead to a 0.159 -unit variation in successful procurement on average, when all the other variables in the model remaining constant. Therefore, the variable Risk has a statistically significant and a positive effect (β=0.159, p<0.01) on successful procurement. Scholars Kejuo (2012) and Mehmood (2019) are agreed on the findings.

4.3.1.11. Comparisons of all Variables in Determining Successful Procurement

Among the given specific objectives, one of the specific objectives is to determine which variable among Performance Management, Technology Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, and Relationship with supplier and Risk has more effect in determining Successful Procurement of Ethio Telecom. Therefore, to respond this objective comparison among variables becomes a must. The standardized coefficients Beta values are important for comparing each independent variables contribution. Thus, perusal table 12 indicates that the highest beta value were observed in the coefficient table labeled standardized beta coefficient were for the variable price which is 0.389. This means that this variable makes the strongest unique contribution to explaining the dependent variable (Successful Procurement), when the variance explained by all other variables in the model is controlled for.

Next to it, the variable performance management has the second largest contribution which is manifested in the beta value of 0.226. System Integration factor come to the third place with beta value 0.206 followed by Technology Standard ,Top Management Support, risk, Relationship with suppliers, change management, Supplier Process/Time and with beta value of 0.168, 0.139, 0.130, 0.123, 0.115, 0.110 and 0.104 respectively.

Chapter 5

Summary of Findings, Conclusion and Recommendation

Introduction

This chapter deals with summary of the major findings and conclusions of the study. At last recommendations for respective stakeholders and for further researchers were suggested based on the findings and conclusions on factors affecting telecommunication network equipment procurement in Ethio Telecom.

5.1. Summary of Major Findings and conclusions

The main purpose of this study was to examine the factors affecting performance of Telecommunication Network Equipment Procurement in Ethio Telecom. The research was guided by the following three basic questions those were stated in chapter one:

- ✓ What does the procurement process practice look like in Ethio Telecom?
- ✓ What are the main factors that affect the performance of Telecommunication Network Equipment Procurement in Ethio Telecom?
- ✓ How to study the factor and their impact on the performance of Telecommunication Network Equipment Procurement in Ethio Telecom?

The research approach was quantitative. Descriptive and explanatory type of research design was used to explain the factors of Telecommunication Network Equipment Procurement that influence Ethio Telecom procurement process and describe the existing procurement practice of the company. The research samples were 70 including managements, experts and administrative employees of Ethiotelecom .The analysis was done using Statistical package for social science (SPSS) to compute descriptive statistics such as percentage, frequency, correlation and regression.

According to the analysis and discussions, the following summaries of major findings were presented in accordance with the above three basic questions.

The major findings in relation to assess the processes of procurement in Ethio Telecom is that

Ethio-Tele com fail to provide formal training related to project and project procurement management. The company considers make-or-buy analysis, expert judgment, and market research, past project procurement documents, and activity and cost estimation for planning project procurement. Associated risks and mitigation plan as well as overall procurement need of the project are identified. The company also follows separate project procurement procedure.

Make-or-buy analysis is made before deciding to buy from outside vendors. 57.14% agree that there is consideration make-or-buy analysis before deciding to buy from outside vendors to meet the project procurement need of the company

Ethio Tele co prepares standardize procurement document to obtain bid/proposal from suppliers. The prepared documents help the company to get accurate, relevant and complete response. It also uses appropriate means of communication announce its procurement documents for its prospective suppliers. It prepares bidders' conference and individually approaches its suppliers toanswerandclarifytheirquestionsanddoubts.Butthecompanyfailstoarrangepre-proposalvisit.The Company uses pre-defined proposal evaluation criteria and prefers to conduct preliminary screening before making detail evaluation the received proposals. Cost and estimated deliverydatesarethemajorfactorsusedforevaluationproposals.Thecompanyalsoconsidersfinancial stability, technical requirement and past experience of suppliers for evaluation. But it fails to consider up pliers risk management issue. Contract is signed between Ethio Telecom and its selected suppliers after reaching an agreement by preparing negotiation panel. The terms and conditions of the contract are open consider future possible requirement change. The company monitor and control that suppliers' performance meets project procurement requirements according to terms of the contract using different methods, any project requirement change is welcomed or rejected by following formal procedure. But the company failed to gather suppliers' performance status from main stakeholders such as project managers and project team members. Besidesthereisweekmonitoringandcontrollingofproductswhicharedirectlyarrivedatprojectsite.Theco mpanyclearlyidentifiescontractcloseoutactivitiesandpreparelesson learned document for its future reference.

The respondent's perception the presence of standardizes predefined proposal evaluation criteria is arranged out of the whole respondents 47.14% strongly agree on Respond for questions and doubts raised by prospective suppliers individually. The researcher has supported the above responses by referring project management process document of the company.

The second research question and major findings in relation to the factors that affect the performance of Telecommunication Network Equipment Procurement in Ethio Telecom is that the researcher adopted ten different variables of interest. These are Performance Management, Technology

Standard, Price, System Integration, Top Management Support, Security, Supplier Process/Time, Change Management, and Relationship with supplier, Risk. The above independent factors are derived from different literature reviews and the adopted by the researcher as well.

The following are the main findings regarding on the third research question which is analyzing the factor and their impact on the performance of Telecommunication Network Equipment Procurement in Ethio Telecom.all the factors have positive correlation and significant. The multiple regressions model Summery shows the value of R Square, which is 0.740 expressed as percentage (74%). This value is large and shows the adequacy of the model. Therefore, this entails that 74%, of the variance in the dependent variable which means successful procurement is explained by the model the ANOVA table also indicates that the model reaches statistical significance (Sig = .000, this really means p<.0005). This implies that the model is adequate (fit) and is worth maintaining. The multiple regressions result shown that the independent variables were significant. The highest beta value were observed in the coefficient table labeled standardized beta coefficient were for the variable price which is 0.0.389. This means that this variable makes the strongest unique contribution to explaining the dependent variable (Successful Procurement), when the variance explained by all other variables in the model is controlled for. Next to it, the variable performance management has the second largest contribution which is manifested in the beta value of 0.226. System Integration factor come to the third place with beta value 0.206 followed by Technology Standard ,Top Management Support, risk, Relationship with suppliers, change management, Supplier Process/Time and Security and with beta value of 0.168, 0.139, 0.130, 0.123, 0.115, 0.110 and 0.104 respectively.

5.3. Recommendations

The practiceofprojectprocurementmanagementinEthioTelecomshowsadeviationwiththatoftheoreticalaspectoftheknowledgearea.Onwhichthecompanyshouldrecognizeandgivegreateremphasis to the identified gaps and ensure the effective management of its project procurement practice. Thus, the researcher provides the following recommendations pinpointing focal points that would be helpful lto the company project procurement management in fruitful directions.

- The company needs to provide adequate training on project and project procurement management area for project team members since it increases their knowledge and skill. The training also helps them for better understanding of the three constraints of project while they make decision.
- The company needs to arrange pre-proposal visit especially for its large procurement decisions in order to view the capability of the market site, production factory, and technical and managerial capability of pre-identified potential suppliers.
- The finding of the study reveals the company is financially dependent on its suppliers for procuring foreign products and services, and more emphasis is given on financial aspect of suppliers for evaluating and selecting among them. The researcher recommends the company not to neglect and consider their risk management practice as well as check how they redistribute in satisfactory manner.
- The company needs to gather performance status report from the concerned stakeholders about the following information but not limited to; the quality of the received products and services, on time delivery of resources, and if training is needed. This will help to take early appropriate measures for the identified gaps before things getting worse.
- The finding of the study reveals Ethio Telecom uses tight monitoring and controlling system for products arrived at regional and central warehouse but fail for products arrived directly at project site. Following this, the researcher recommends the company should develop tight monitoring and controlling system on those products directly arrived at project site.

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Appendix 1: Questionnaire

ST. MARY'S UNIVERSITYGRADUATE STUDIES

Masters of Art in Project Management

Dear Sir/Ma'am,

You are invited to participate in this survey. Therefore, this questionnaire has been developed as part of my post graduate program research at ST. MARY'S UNIVERSITY, this is a questionnaire to collect data for the research entitled as "**Factors affecting the performance of Telecommunication Network Equipment Procurement**". The objective of the questionnaire to examine the factors affecting the performance of Telecommunication Network Equipment Procurement in Ethio Telecom**.**Your participation is voluntary and your responses will be confidential. The questionnaire has two parts. The first part focus on your background and Ethio telecom background as well. The second part addresses the required information to achieve the research objectives. If you have questions, you may direct to me.

Thank you very much for your support to this research. We further hope you too may find this exercise useful in thinking through your firm's technological capability strategy.

Regards

Meskerem

0921626660

Part I

Demographic Characteristics of respondents (General Background)

1. Age……..

2. level of Education

- Diploma
- Bachelor degree
- Postgraduates
- Other, please specify…….

3. Respondent position in the firm

- Manager
- Supervisor
- Expert Specialist
- Administrator
- Other please specify……

4. For how many years have you worked on issues related with project procurement? .....

Part 2

Understanding project procurement practice at Ethio Telecom

This section is to find out your opinion about the project procurement practice at Ethio Telecom. Please circle your answer for multiple choice questions and indicate your opinion by putting (√) on the appropriate number for the five point scale questions where: Strongly Disagree=1, Disagree=2, Uncertain=3, Agree=4, and Strongly Agree=5

Q.no	Questions	1	2	3	4	5
1	Make-or-buy analysis is made before deciding to buy from outside vendors.					

2	Market research is conducted.					
3	There is consideration of past procurement documents for making future decision					
4	The prepared document (RFP&RFI) helps to get accurate, relevant and complete information from suppliers.					
5	Pre-proposal visits is arranged					
6	The company use bidders' conference/pre-bid meeting to give answer for the asked questions and doubts to all prospective suppliers.					
7	The company respond for questions and doubts raised by prospective sellers individually.					
8	There is standardizing pre-defined proposal evaluation criteria.					
9	Preliminary screening is used before making detail evaluation of proposal.					
10	The following points are considered for selecting suppliers proposal;					
	✓ Financial stability					
	✓ Technical requirement					
	✓ Risk management issue					
	✓ Past experience					
11	The terms and conditions of the contract are open to consider future requirement change (the contract is open for amendment).					

12	The companies monitor and control that suppliers' performance meets project procurement requirements according to terms of the contract.					
13	Suppliers' performance status is gathered from stakeholders such as project managers and project team members.					
14	The company follows formal procedure to accept/reject project requirement change.					
15	Contract closeout activities are clearly identified.					
16	There is lesson learned documentation					

Questions 1-10 have organized by the researcher with five response options as: strongly agree, agree, disagree, strongly disagree and neutral. Please put right (✓) marks on option you agree.

Please rate your company

No	Questions	Strongly agree	Agree	Disagree	Strongly disagree	Neutral
1	Performance Management					
1.1	Ethio telecom measures performance of an equipment.					
1.2	Ethio telecom has a criteria to measure system performance.					
2	Technology Standard					
2.1	Ethio telecom purchase equipment is to current standard and trend, with acceptable technical standard, as well as good content					
2.2	Ethio telecom relies on new					

	technological innovations in network equipment that will serve the current organizational and customers' demands.					
3	Price					
3.3	Ethio telecom pricing techniques lies in balancing the trade-off as well as achieving great value for money					
3.2	Ethio telecom uses request for quotation (RFQ) and other methods to gain a better price for the equipment's					
4	System Integration					
4.1	Ethio telecom has the ability of integrating an equipment with existing systems in real time.					
4.2	Overall procurement need of the project is identified at the end of planning.					
5	Top Management Support					
5.1	Top management of Ethio telecom has the ability to understand of the capabilities and limitations of procured equipment and technical stuff and easy bureaucracy					
5.2	There is a separate procedure to be followed for managing project procurement.					
6	Security					
6.1	Ethio telecom has Good security controls, technical safety, software and hardware reliability, and counter-					

	measures techniques					
6.2	Activity resource and cost estimation is considered while planning.					
7. Supplier Process/Time						
7.1	Delivery time of the procured equipment's managed to fit with the entire bigger project plan in ethio telecom					
7.2	Cost and estimated delivery date are the main factors used for evaluating project procurement proposal					
8. relationship with supplier						
8.1	Standardize procurement document is used to obtain bid/proposal from Suppliers.					
8.2	Procurement documents such as RFP/RFI/IFB are announced for targeted vendors using appropriate way of communication.					
9. Change Management						
9.1	Ethio telecom hasgood feedback process and help desk that will help users to effectively switch and adopt to the new piece of equipment.					
9.2	The company follows formal procedure to accept/reject project requirement change.					
10. Risk						
	Ethio telecom has the Ability to withstand environmental and other risk factors during the procurement of an equipment.					

	Associated risks and mitigation plan is identified while planning procurement.					

Thank you!!!