Comparison of Ericsson and Huawei Project Implementation Performance in Ethiotelecom Expansion Project

A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Business Administration (MBA)

BY:

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JIMMA UNIVERSITY

COLLAGE OF BUSINESS AND ECONOMICS

MBA PROGRAM

DECEMBER 01, 2020

JIMMA, ETHIOPIA

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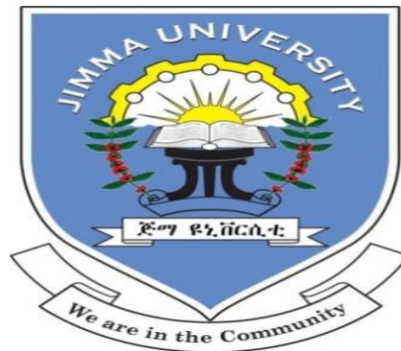
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DECLARATION

I hereby declare that this thesis **"*Comparison of Ericsson and Huawei Project Implementation Performance in Ethiotelecom Expansion Project''*** has been carried out by me under the guidance and supervision of Dr. Mekonnen Bogale and Mrs. Nechitu Legesse.

The thesis is original and has not been submitted for the award of any degree or diploma to any university or institution.

Researcher's Name	Date	Signature
___Piniel Deribe_____	_____	_____

CERTIFICATE

This is to certify that the thesis entitles "Comparison of Ericsson and Huawei Project Implementation Performance in Ethiotelecom Expansion Project'', submitted to Jimma University for the award of the Degree of Master of Business Administration (MBA) and is a record of confidential research work carried out by Mr. Piniel Deribe under our guidance and supervision.

Therefore, we hereby declare that no part of this thesis has been submitted to any other university or institutions for the award of any degree or diploma.

Main Adviser's Name	*Date*	*Signature*
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Mrs. Nechitu Legesse	_____	_____

APPROVAL SHEET OF THESIS

As members of the Examining Board of the Final Open Defense, we certify that we have read and evaluated the thesis prepared by Mr. Piniel Deribe, entitled "Comparison of Ericsson and Huawei Project Implementation Performance in Ethiotelecom Expansion Project'', and recommend that it be accepted as fulfilling the thesis requirements for the award of the degree in Master of Business Administration.

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Name of Chairman   Signature   Date

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Name of Internal Examiner   Signature   Date

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Name of External Examiner   Signature   Date

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Abstract

The Telecom industry and project performance are regarded as factors that have great potential to facilitate growth. The purpose of this study was to study the comparison of Ericsson and Huawei project implementation performance in the Ethiotelecom expansion project. Specifically, the study was guided by the following objectives; to examine the effect of organizational culture, managerial capability, technical capability, and site location and situation factors on project performance and compare project performance level in the expansion project, Ethiopia. The study uses a quantitative approach and tries to follow an explanatory research design scheme. The data collection instrument used for the research was the questionnaire. The questionnaire was developed mainly based on Telecom project factors and project performance. In the questionnaire a five-point Likert scale was used, 73 structured questionnaires were distributed and return all filed. The quantitative analysis method was the preferred technique for the analysis of data obtained. Correlation analysis was implemented to test the direction of the relationship between the independent variables and dependent variables. Multiple linear regressions were used to test organizational culture, managerial capability, technical capability, and site location and situation factors influence on project performance. The study found that on Ericsson project performance managerial capability factor has the highest contribution followed by organizational culture, technical capability, and site location and situation factor on project performance. In Huawei project performance organizational culture factor has the highest contribution followed by managerial capability, technical capability, and site location and situation factor on project performance. A paired t-test was used to compare project performance among them, accomplish the project on the baseline, finalized project at planned budget Huawei perform better but implement on the set of quality standard Ericsson was better. A similar result on satisfied client Ethiotelecom and develop a competitive advantage in Ethiopia. The study concludes that the higher attachment to network infrastructure project factors, gives better the project performance, thereby resulting in creating "strategic fit" with the factors in which and where they deploy.

Keywords: Performance, Expansion Project, Project Management

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CHAPTER ONE

1. INTRODUCTION

1.1 Backgrounds of the Study

The telecommunications industries are the sector of information and communication technology that provide data and voice services. It plays a crucial role in the evolution of communications and the information society which highly impacts a country's development. According to Brian (2019), different stakeholders or vendors are involved in the telecommunication industry for producing goods and services delivery. Firms compete with each other for sustains profits with a competitive advantage by the research center to introducing new products and to innovate new technologies and serving customers on effective project deployment with training and supply spares. The user needs the fastest value to add services and delivery to use computer-based data applications in the working environment.

Baburajan (2018) analyze telecom firms' performance, telecom industries to generator the biggest revenue to improve the system by using a business transformation program to apply the latest technology. The companies implement the project as a need of operator requirements to achieve their vision, mission, and objectives done such activities of point broken down, arranged into workgroups, scheduled and assigned to specific individuals with strict follow-up and corrective action. The telecom operators are transforming their existing network infrastructure and services to supreme businesses on their competitors and generating better revenue.

Ethiotelecom expansion project stated by Lancaster (2019), purposed to expand the network to an unreached area and increased capacity within the quality of service by deploy 3G and 4G mobile networks. The operator increased coverage and capacity was to increase profitability as well as the number of subscribers by business operational expenses efficiency and massive service supply. The expansion project was from 2014-2016Gc by a given contract for international telecom vendors Huawei, Ericsson, and ZTE and civil work contracts given to SME. When Ethiotelecom decided to invest also planned a return on investment period from the new services

and business demands. The Ethiotelecom expansion project was structured by one central director with a logistics section, project rollout section, and contact management section. The regional project offices according to the Ethiotelecom project circle included the logistics section and the project rollout section. The contract management did on management the contracted vendors', the logistics section materials utilization that was assigned at each site. The project rollout section follows up activities on-site equipment delivery, proper installations of the tower, cabling, devices, and responsible for acceptance.

In December 2010, Ethiopia Telecommunications Corporation (ETC) became rebranded as Ethiotelecom and outsourced management functions to France or Orange telecom via its subsidiary Sofrecom. The ETC was established in 1952, and since that time has been Ethiopia's sole telecommunications provider. According to France telecom, the objective of the management contracted was to transform and modernize the operations of Ethiotelecom to world-class standards, including through capacity building for managers and transfer of know-how and best practice. The goal was to improve the delivery of telecom services in Ethiopia and achieve management autonomy before the end of the contract. Orange, through its subsidiary Sofrecom, was to oversee this broad restructuring of Ethiotelecom as part of the nationwide Business Process Reengineering (BPR). The latest round of BPR in Ethiopia began after the 2005 elections and involved an overhaul of the structures and work processes of law enforcement, security, and other key institutions to improve efficiency ended in mid-2008. In January 2013, EthioTelecom's management agreement with Orange ended, and Ethiopian managers took over the key positions. Under Orange's management, telecommunications coverage in Ethiopia grew from 8 to 25 percent. In the same period, the number of Ethiotelecom employees dropped from 12,600 to 8,600. Again Orange and Ethiotelecom signed an additional one-year agreement, to continue on network design, architecture, technology selection negotiation, and related technical areas. In the article (Lancaster, 2019), Ethiopia was one of the last countries in Africa to allow its national telecom a monopoly on all telecom services. However, in June 2019 the government approved legislation that opens the market to competition and provides much-needed foreign investment. In the process of part-privatize Ethiotelecom, the company was audited, while two licenses are expected to be offered to two international operators.

As Aaron (2013) report Ethiotelecom expansion project objective was to increase telecoms service access and coverage across the nation as well as to upgrade the existing network. In June 2011, Ethiotelecom issued to upgrade infrastructure planned to enable to double mobile subscribers more than 50 million by international vendors, then signed a $1.6bn deal with Chinese vendors ZTE and Huawei in a bid to expand network infrastructure 3G services and 4G broadband to the capital city of Addis Ababa. The project is splinted between ZTE and Huawei, with each contract worth $800m but both firms showed low interest in vendor financing to Ethiopia. They signed a $700 million agreement with China's Huawei Technologies to expand network infrastructure and 4G broadband network. Huawei had been involved in developing voice and data services in the horn of Africa country for several years. Ethiopia signed an $800million agreement with Chinese telecom giant ZTE to expand its telecommunications network, national operator Ethiotelecom.

Swedish telecom group Ericsson signed a contract with Ethiotelecom to expand network infrastructure, took a slice of an $800 million contract from Chinese firm ZTE in 2013 because Ethiotelecom and ZTE differed over the cost of upgrading an existing network. Commsupdate (2014) reported Ethiotelecom said to the firms were expected to carry out the upgrade at no extra charge, while ZTE requested an additional $150 million to $200 million cost. Ericsson without given additional value entered to expansion work took over four circles from the total of six circles of the project; ZTE had lost four circles of their share but had resumed into two circles. Ericsson's contract agreement was included design, planning, deployment, and optimization 2G and 3G mobile network to improved coverage, capacity, and quality of network in southern Ethiopia. In recent years in Africa, China highly involve in many economic sectors, Ethiopian telecommunication signed $1.6 billion contract agreement with the Chinese companies by a long-term loan package.

In 2006, ETC took a major step towards modernizing its outdated infrastructure; signed contracts worth US$2.4billion with three major Chinese companies ZTE, Huawei, and China International Telecom Corporation (CITCC) rapidly develop the country's telecommunications infrastructure. These companies had done a large role in laying Ethiopia's main fiber-optic communications network. Also in 2006 ZTE vendor signed a three-year contract to deployed $1.6billion, the exact category of

equipment sold under the deal is unclear, but ZTE was tasked with a major upgrade of both fixed-line and 2G mobile infrastructure and services. ZTE sells orange of telecommunications equipment, software, and services, including network switches, mobile handsets, and software systems. Also Vibhuti, (2014) state, there was a lack of transparency and heightened risk for corruption because of the nature of the Process.

Huawei Technologies was been contracted at over $10million with Ethiopian Telecommunications Corporation (ETC). As Light reading, (2004), Huawei constructed CDMA2000 WLL and PSTN network and spares in Ethiopia reliable telecom provided. The WLL system can quickly access the subscribers and in a cost-effective way promoted the teledensity in Ethiopia, traditional PSTN accelerates by an expansion of a business.

Ericsson has done business in Ethiopia for a long time. Sales of telephone receivers commenced in 1894, and Ethiopia remained faithful to the company. The breakthrough occurred during the 1950s when Ericsson started to supply 500-point switching systems. Ericsson had clear links with Ethiopia since the head of the national PTT was a Swede, and supplies of telecom equipment formed part of a development assistance project are also the UN was involved. Ethiopia ordered its first crossbar switching exchange in 1961, and Ericsson continued to supply equipment for the large-scale installation of automatic exchanges. After five years later, a relatively large exchanger with 10,000 subscriber lines went into service in Addis Abeba and opened a technical office in Addis Abeba based on Lemma (2015).

This research is to compare performance on implementation between Ericsson and Huawei vendors in the Ethiotelecom expansion project with significant recommendations to improve operator performance. Interviews and questionnaires were used to compare company performance based on project management assessment. First, investigate each Huawei and Ericsson Company's organizational culture, managerial capability, technical capability and site location, and situation within a concern of project performance. Its use as an input for operators and vendors for the next telecom projects especially in Ethiopia.

1.2 Statement of the problem

In the telecom industry, the vendors have many practices as works out of the country, assigns different skilled and citizen's employees, management strategies, and so on. Both Ericsson and Huawei companies are in growing status are through technologically, economically, and market share acceptance to sustain and lead in the telecom industry. Also, Ethiotelecom has a trend of work with different vendors in different projects according to (Baburajan, 2018) and those companies have previous telecom project implementation experience in Ethiopia, and market-leading companies worldwide track Record. They still incline in delivery services and manufacture products they are profitability based on the firm's annual report.

In 2011 Ethiotelecom had selected Huawei and Ericsson to improve 2G and deploy 3G networks known as an expansion project. Under the terms of the agreement, the project was valued at 800million dollars for each company, and the commission deadline was before June 2015. According to (Commsupdate, 2014) both Huawei and Ericsson had not satisfied the client of Ethiotelecom at the expected level. Ericsson implemented the expansion project, and Huawei implemented the network expansion project also 4G in Addis Ababa. Ethiotelecom complained about implement issues such as baseline and quality project delivery, due to which Ethiotelecom had thought to would withdraw the contract. Thus, the expansion project unfinished at the planned time, and the low-quality project distorted the forecasted of the sector return on investment and growth and transformation plan (GTP) it reports by (Adrian, 2015).

Both companies in the expansion project performed low quality and undelivered in the schedule period. These problems need identification for root causes that are attributed that affect the project performance in quality, budget, and schedule as well as develop competitiveness within client satisfaction. Telecom or IT projects implementation engagement with professional management to exceed engineering a project performance of the large economic sector. Based on these, performance may be affected due to many reasons, so that the study investigation to address project implementation bottlenecks, such as organizational culture, and structure, managerial capability, and technical capability, and site's geographical location and situation factors.

1.3 Objectives of the Research

1.3.1 General Objective

The general objective of this study is to compare performance on expansion project implementation between Ericsson and Huawei vendors in Ethiotelecom.

1.3.2 Specific Objectives

To achieve the overall objective of the study the following specific points are addressed:

1. To investigate differences in organizational culture, and structure affect the project performance.

2. To investigate project managerial capability influence project performance

3. To examine the impact of technical capability on project performance

4. To identify sites location and situation that influence performance

5. To compare companies project performance in the expansion project

1.4 Research Hypotheses

The listed hypotheses are made to guide the study.

HA: There is a significant relationship between project performance and organizational culture.

HA: There is a significant relationship between project performance and managerial capability.

HA: There is a significant relationship between project performance and technical capability.

HA: There is a significant relationship between project performance and site location and situation factors.

The independent variables are organizational culture factor, managerial capability factor, technical capability factor, and site location and situation factor. If there is a

significant difference between dependent variable and independent variables then compare independent variables' influence on each company.

HA: There is a significant difference between Ericsson and Huawei project performance.

The project performance comparison parameters are accomplished project on schedule, finalized project at planned budget, implement project in a controlled the quality of standard, satisfied client Ethiotelecom in project delivery, and develop a competitive advantage.

1.5 Significance of the Study

This research gives an analytical result in a telecom project implementation factors within the comparison of the project performance among Huawei and Ericsson in the deployment of the Ethiotelecom expansion project. Identify a relationship between project performance and organizational culture, managers and technical capability, site geographical location, and situation factors. The importance of this research is to academics, Ethiotelecom, or other entering operators to Ethiopia, and vendors. In academics, it uses to bridge the knowledge gap in practical project management in the implementation, and use as an input for further research. This finding is used to avoid common problems as well as maximized profit for vendors and to give the best satisfying project. It gives for vendors Ethiotelecom or other operators to implement next projects well, and operators by understanding the situation to increase cooperation with vendors to achieve their goals.

1.6 Scope of the Study

This study focused on the comparison of the project performance Ericsson and Huawei project implementation in the telecom expansion project in Ethiopia. Also analyze each company project performance with the project implementation factor such as organizational culture, managerial, and technical capability, site geographical location within a situation.

1.7 Structure of the Paper

This paper is organized as follows: chapter one contains an introduction or background of the study, and chapter two contains the literature review. Chapter three presents the research methodology while results and discussion are incorporated in chapter four. Finally, this paper contained the conclusion and recommendation part in chapter five.

1.8 Limitation of the Study

This study may have different limitations to analyze more in secondary data unavailable of expansion project financial reports except for company official annual reports due to secretly and to collect primary data more from other cities out of Adis Abeba. In this regard, both companies decrease the number of employees due to the project ended so that cannot get more respondents for better find out and not The study did not include the ZTE vendor and Ethiotelecom project team as well as not all regions in Ethiopia. As a result, the findings reported in this study might not fully represent or reflect the situation in the project implementation in Ethiopia as a whole. The study also did not explain or address performance differences across Chinese vendors ZTE and Huawei, the findings, and conclusions in the study, therefore, would not be taken performance listing or not mention the country as generalizations.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

This segment explores the theoretical and empirical background of this research and attempts to establish a link between project implementation desired elements and analyzer points based on key indicators to evaluate the project performance based on existing literature with a view of establishing gaps, consensus and controversy explained by Horwitz, Horwitz (2007).

2.1 Theoretical Review

2.1.1 Organizational Culture and Structure

The culture and values competence element describes the project manager's approach to the influence of the organization's culture and values on the project. The success of a project is measured in the strength and fruitfulness of team functions. The professionalism of Project managers should be kept not intermingled with another side of life unrelated to the work area. Also, the primary focus of the project manager must be to ensure that relationships with all the stakeholders have limited on the work linked issues. Personal relationships clutter the project manager's ability to make rational decisions.

The building of trust and confidence with stakeholders can be achieved through acting with integrity in facing situations, keeping commitments, providing access to the information in all situations, defending for the team member on probable unjustified criticism, maintaining composure, and demonstrating fair treatment of partners and sellers. According to Smyth, Gustafsson, and Ganskau (2010), trust is socially constructed and is developed iteratively in largely intuitive ways that are frequently unconscious and intangible. That is why it is obligatory for IT project managers to facilitate the development of trust and form promoting it showing the importance of trust and the value of trust itself.

Every project is undertaken to deliver value to the organization. Through the alignment of projects to the organizational vision and strategies, value is created as projects contribute to the realization of the vision and strategies. Team members want

to grasp the main reason for the necessity of the project. Team members feel thus worthy of belonging to a team that contributes to the overall success of the organization and this fuels their motivation that carried out by Marnewick (2011), on motivates teams.

An IT project manager can effectively manage a project by appropriate deployment and use of human power, wise in the financial, proper use of inventory, intellectual, and intangible resources that explained in (Project Management Institute 2007). The managing unit consists of building and maintaining the project team, planning and managing project success, and resolving conflict within the project team. According to Marnewick (2011), the project manager leads to satisfying and motivates the team member to better perform; it needs recognition of a team member's. Cultural management is closely linked to the organizational culture of the organization as the IT project manager draws from this when managing an IT project. Furthermore, Gu et al. (2014), reveal that there is a strong relationship between organizational culture and IT project performance. IT project managers must be able to balance their interests and organizational interests continuously. Various organizational structures exist:

Functional organizations: Projects having a single functional division are not vulnerable to particular organizational issues, but projects participating in many functional divisions can be challenge full. Projects that extend across functional divisions are needs to be managed there is no clear authorized one. For cooperation and support from each functional managers in the divisions for performing the objective in the task.

Matrix organizations: Matrix structures give authority to both project managers and functional managers, and the goal is to provide a more seamless division of labor and ultimately to build a stronger team culture. But, the potential for conflict between functional managers and project managers may persist in its existence because of resource conflict. Everyone who is on a project team is under dual bosses the functional manager and the outer boss the project manager.

Projectised organizations: In a projectised organization authority is centralized. Projects are removed from functional divisions which enhances the shortening in lines of communication. This makes the decision process speedy and project in the case builds a sensible degree of identity; these amend commitment from team members. The involvement in consecutive projects of a similar nature projectised organizations able to develop and maintain long-term experience and skills in specific areas (Di Vincenzo & Mascia 2012), also team members to be understand each culture and create trust.

Huawei Company

Huawei Technologies Co., Ltd. is a Chinese multinational technology company that provides telecommunications equipment and sells consumer electronics, including smartphones, main office in Shenzhen, Guangdong province. By the time of its foundation in 1987 by Ren Zhengfei, its main focus was manufacturing phone switches. By now Huawei has expanded its business to include building telecommunications networks, providing operational and consulting services and equipment to enterprises both domestic and abroad, and manufacturing communications devices for the consumer market. Huawei had products and services in more than 170 countries, over 188,000 employees as of September 2018, around 76,000 of them engaged in Research & Development (R&D). It has 21 R&D institutes around the world, and in April 2019, opened the dedicated Ox Horn Campus in Dongguan. As of 2017, the company invested US$13.8 billion in R&D according to (Corporate Information - Huawei, 2020). In December 2018, Huawei reported that its annual revenue had risen to US$108.5 billion in 2018 it increases 21% over 2017) (Huawei, 2019).

Huawei Corporate Governance Overview

The company gains long-term growth by staying customer-centric and inspiring dedication. Improvement in corporate governance structure, organizations, processes, and in each system added a positive outcome in the success of the company. The Shareholders' Meeting is the company's authoritative body, making decisions on making decisions on major issues such as the company's capital increase, profit distribution, and selection of the members of the Board of Directors/Supervisory Board. The Board of Directors (BOD) tasks are works related to corporate strategy,

operations management, and customer satisfaction. The BOD's mission is to lead the company forward. It has authority over corporate strategy and operations management also ensures the customer and shareholder interests to be met. The BOD and an executive committee led by rotating chairmen. During their terms, the rotating chairmen serve as the foremost leader of the company. The task of overseeing the work results of BOD members and senior management, mentoring operational and financial status of the company, and assisting and being watchful on internal control and legal compliance. KPMG has been Huawei's independent auditor since 2000. The auditor is involved in auditing a company's annual financial statements. The independent auditor counter checks accounting standards and audit procedures and release its opinion on if the financial statements are true and fair (Corporate Information - Huawei, 2020).
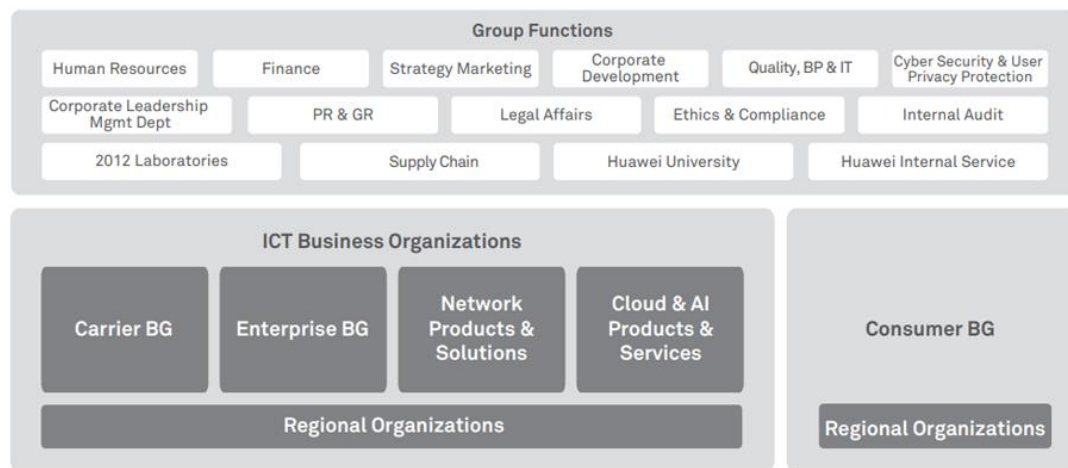
Figure 2. 1: Huawei Corporate Governance Overview

Source: Huawei/corporate-governance (2019)

To strengthen end-to-end operations management of ICT infrastructure business, the corporate found out the ICT Infrastructure Managing Board, which is that the proprietor the business strategy, operations management, and customer satisfaction for ICT infrastructure business state in Fletcher, (2011). To strengthen strategy and risk management and increase decision-making efficiency for the buyer business, the corporate found out the buyer Business Managing Board, which is that the primary owner of the business strategy, operations management, and customer satisfaction for the buyer business Corporate Information - Huawei, (2020).Huawei

Mission, Vision and Values

The mission statement is "we are committed to bringing digital to every person, home and organization for a fully connected, intelligent world." The vision statement is "To focus on our customers' market challenges and needs by providing excellent communications network solutions and services to consistently create maximum value for customers." The core values Customers First. Huawei exists to serve customers, whose demands are the driving forces behind our development and dedication. They win customers' respect and trust primarily through dedication, Continuous Improvement, Openness & Initiative, Integrity, and Teamwork state by David and Tian, (2015).

Ericsson Company

Ericsson is a Swedish multinational networking and telecommunications company the Main Office is located in Stockholm. The company is best known for providing services, software, and infrastructure in information and communications technology telecommunications operators, and so on. Ericsson had a 35% market share in the 2G/3G/4G mobile network infrastructure markets in 2012 report on Company facts, (2019). The company currently has 95,000 employers and active in 180 countries worldwide. Also, they have over 49,000 granted patents as indicated in September 2019, it is along with wireless communications. Starting in 1983 Ericsson Enterprise provided communications systems and services for businesses, public entities, and educational institutions explained to Acquire Ericsson's Enterprise Communication Business, (2014).

Governance structure

Shareholder's rights are entertained in the time of general Meetings of shareholders. The nomination committee is selected by major shareholders every year. The Process is facilitated by the Nomination Committee adopted by the Annual General Meeting of shareholders. The tasks of the Nomination Committee include the proposal of an external auditor and Board members for election by the Annual General Meeting of shareholders and proposals of Board member and auditor remuneration. In addition to the Board members elected by shareholders, the Board of Directors consists of employee representatives and their deputies, which the unions have the right to appoint under Swedish law. The board of directors is the one in charge of strategy, the

organization of Ericsson, and the management of its operations. The Other Task day-of to-day management is performed by the president and CEO, appointed by the Board of Directors. The president and CEO support the executive team, and the external auditor selected on a meeting of shareholders Company facts, (2019).
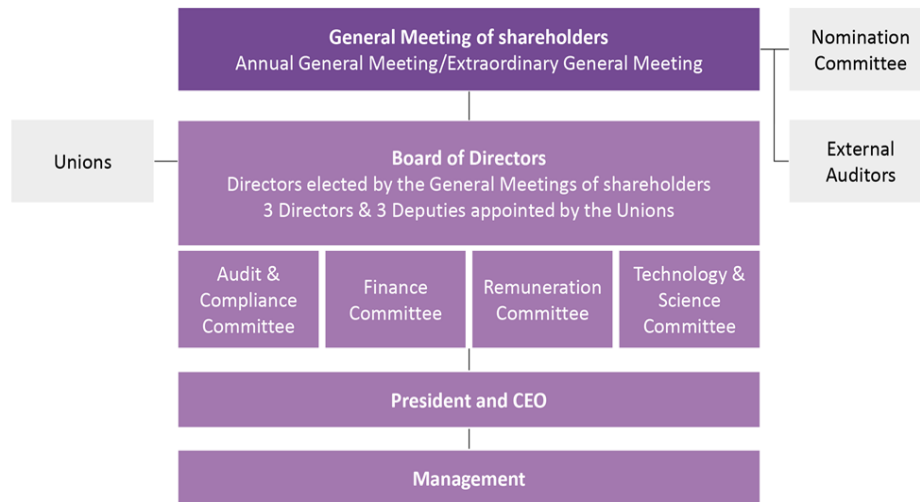
Figure 2. 2: Ericsson Governance structure

Source: Ericsson/corporate governance (2019)

The Go-to-Market Approach built increasing Reachability and cooperation between Business Areas and Market Areas. There are currently five established market areas selling and delivering customer solutions, with a focus on creating winning customer experiences, and three business areas that are responsible for developing and maintaining products and service offerings and secure delivery capability.

Mission, Vision and Values

At Ericsson, they share three core values: Respect, Professionalism, and Perseverance. They have established over 140 years of history, in internal surveys show that 90% of employees feel that core values are relevant to them. A work culture creates a positive people experience that makes it easy for them to focus on their business and their customers. The cultural sweet spot takes values to the next level to outline the actions and behaviors needed to empower everyone to perform at their very best.

2.1.2 Key Skills for Network Project Manager

 A project has many critical measurements such as the timeliness, budget, quality, and effectiveness of the project (Haile, 2019). Effectiveness is concerned with producing the desired results with the utilization of appropriate resources, tools, and techniques in hand on all the project management activities (Project Management Institute 2007). The project managers believe in their account in resolving problems facing and selecting proper solutions helping benefit to be maximized and negative impacts minimized. IT project managers procure and manage equipment and raw materials this is a common case mainly in infrastructure projects. Although the volumes and complexity may not be on such a high level as in the engineering or construction sectors, project managers require academic and experience to effectively deliver a final project.

Leadership

This skill is important for achieving the baseline, the strength of character to bring a project to completion, involves the stakeholders, working team, and a major test of character. It needs a deep well of power to bring a project to a successful conclusion and need to bring a lot of people together. Leading by example is a great way of doing this, being professional in all and making sure everyone involved understands what the aims of the project are a preset success and the role in the attaining of it. Müller and Turner (2010) stated that the project manager guides inspires and motivates team members and other project stakeholders to manage and overcome issues to effectively achieve project objectives.

Communication

Marnewick (2011) declares personal communication skills of the project manager focus to effectively exchange accurate, appropriate, and relevant information with stakeholders using suitable methods. The primary task is on the understanding of and responding to the various stakeholders. The main works are understanding of explicit and implicit content of a communication. Also responding to expectations, concerns, and issues of the stakeholders raise. The quality and validation of information is assuring within activities of the accurate provision and factual information.

Organization

The way organization is structured influences how to manage and run projects respecting the organizational framework for running projects, balancing individual interest with organizational interest, and assigning team members in an unbiased way to appropriate tasks. It can also influence how much authority and reach have to do the job as a project manager. The organizational structures and project managers work in all areas of functional, project, and matrix to a successful project.

Professionalism

This Professionalism focuses on conforming to ethical behavior governed by responsibility, respect, fairness, and honesty in the practice of project management. According to Konstantinou (2015), the activity concerns on the project manager's commitment to the project and actively supporting the project's and the organization's missions and goals need professional project managers. Working within a recognized set of ethical standards and seeking to avoid and disclose any possible conflict of interests to all stakeholders are the activities that form part of integrity and in the handling of personal and team adversity in a suitable manner.

Cognitive ability

The Project Management Institute (2007) explained cognitive ability an appropriate depth of discernment, perception, and judgment as the application of to effectively direct a project in an evolving environment. Cognitive abilities are brain-based skills from the simplest to the most complex IT project managers need to carry out any task. Cognitive abilities do more with the mechanisms of how IT project managers learn rather than with any actual knowledge, remember, do problem-solving, and pay attention. The cognitive ability contains such a holistic view of the project, resolve issues that stem from the project, use the appropriate tools at the appropriate times, and seeking opportunities to improve the outcome of a project.

2.1.3 Key Skills for Technical

A telecom job is technological, technical, and knowledge-based work telecommunications employee must have some skills set to be an asset for the company and be a successful employee (John, (2019) explained management skills, problem-solving, self-motivation, technological skills, multitasking skills, teamwork, communication and coordinating, writing and analytical skills, and physically fit.

Technological Skills

An individual must have some technical skills to be a successful telecommunications worker, specific skill on a wireline or wireless focuses on the radio access network, the backhaul subsystem, and the core subsystem parts, these are needed for the infrastructure deployment. Education background should be a bachelor's degree in computer science, electrical or electronic engineering, information technology, or another related field. A telecommunications worker should be capable of skills of telecommunications systems engineering, telecommunications knowledge, telecommunications technologies, programming, audiovisual maintenance, provisioning, technical understanding, functional and technical skills, independence, attention to detail, verbal communication, and documentation skills.

Multitasking

Multitasking is a skill for telecommunications workers, which indicates effectiveness because several tasks might need to be done at the same time, so communicating well and finding the proper work way. While one employee physically does a task, identifying which task needs which activities are skills that use quite frequently in vast work.

Self-Motivation

Self-motivation is another skill a telecommunications worker must-have, especially if the work must be completely out of the office or at home. The job has redundancy behavior and new challenges behavior so it needs self-inspiration. Peterson (2007) stated that "Motivation can inspire, encourage, and stimulate individuals to achieve common goals through teamwork; it is in the project manager's best interest to drive toward project success through the creation and maintenance of a motivating environment for all members of the team".

2.1.4 Competitive Advantage

The achievement of competitive advantage is not always permanent or even lasts long that explained by (Dess, Alan, and Lumpkin, 2006). Once an institute establishes itself in an area of advantage, other institutes follow suit to capitalize on their similarities. A more effective resource is one that delivers better value for money. The resource either helps to produce a superior or more attractive offering or produces an offering that matches its substitutes in quality but does so at a lower cost. Cost advantage may be either be retained by the seller as extra cash flow or be passed to the customer as a price reduction.

An organization is said to have a 'sustainable' competitive advantage when the benefits of the institute's strategy can't be copied by competitors. Institute should attain a sustainable competitive advantage and with generic strategies should be grounded in an attribute that meets the following criteria. These are valuable is a value to consumers, many commonplace or accessible, inimitable can't be copied by competitors, and non-substitutable consumers or consumers not substitute another product or attribute for the one providing the firm with a competitive advantage.

2.1.5 Company's Performance Evaluation

Performance evaluation is defined as perceive performance evaluation as a process where the company's results are evaluated quantitatively by analyzing some indicators. On the other hand, the authors of the latter decade (Narkunienė and Ulbinaitė, 2018), note that performance evaluation should not necessarily be quantitative. Managing quality evaluation, defining customer value and value made for other interested bodies, exposing the prevalent business situation, and planning for further goals formulating company improvement is vital. The most presumptive and exact perception of performance evaluation can provide a broad and multifunctional process that combines the key performance indicators. It helps to evaluate performance, guarantees company management process, value creation, adjustment, speedy reaction, and enables improvement and growth of a company.

Under a dynamic business environment, performance control plays an especially significant role, thanks to which one can observe ongoing changes and timely react to them. For a long time, performance evaluation has been conducted based on

financial activity information by analyzing indicators of profitability, liquidity, solvency, and other financial ones. On the other hand, in the modern economic environment, it is more and more often than the traditional performance evaluation methods receive criticism. The traditional performance evaluation systems do not help to solve managerial problems that arise under the context of dynamic business conditions; these systems are not capable of evaluates real factors that create value. Due to this, modern performance evaluation methods have a higher demand for business performance evaluation.

After conducting a research literature analysis on the topic of business evaluation systems (Narkunienė and Ulbinaitė, 2018), the authors suggest the classification scheme of performance evaluation methods, classified into smaller groups according to method contents and performance evaluation purposes. Traditional performance evaluation methods, as was mention earlier, include analysis of financial performance results and their relative values. In modern evaluation methods have to be divided into the following six groups: performance record (accounting) methods, quality management concept methods, causal relationship theory models, business process evaluation models, balanced system models, and multi-criteria methods.

2.1.6 Site Geographical Location and Situation

Analytical ability and environmental understanding are facilitated by the usage of various tools and techniques (Seabra & Almeida 2015). Geographical location and place are used to identify a point or an area on the Earth's surface or elsewhere. The geographical location of the area indicating social attributes with surrounding attributes sense of geometry on the area. The exact site location landscape includes weather, landforms, climate, and water availability.

The site situation has defined the location of a place relative to its surroundings and other places. Projects over multinational range involve several languages and cultures it is obvious this makes communication that much more difficult. These factors include the accessibility of the location, and how close to infrastructures such as road, electricity, and telecom services, living expenses, weather conditions, and society approach, language interaction.

2.2 Empirical Review

This part is the review of different researches and designs to investigate the relationship between organizational culture, managerial capability, technical capability, and site location and situation with project performance.

Mideksa Anbese (2017) in his study "assessment on performance and challenges of Ethiotelecom infrastructure expansion project implementation, monitoring, and evaluation" and found out there are some gaps in project implementation. The project had no specific schedule frame for each task to create awareness for respective vendors. The expansion project was delayed due to a lack of effective resource and time management. In the telecom expansion project vendors and the Ethiotelecom team had not well-defined tasks by using the responsibilities matrix clearly. Top management in the expansion project didn't use more feedbacks from project teams. In general, in the telecom expansion project, there was a low-level collaboration with vendors, government administrators, and societies and a lack of information sharing between government, vendors, and the Ethiotelecom project team.

Sintayehu fiseha (2017), "assessed practices and challenges of knowledge transfer in offshore outsourced telecom project in the case of Ethiotelecom" and found that the knowledge share practices are not developed. Project about task activities procedures and training more related to specific work not transfer well. There are also different challenges found to impact the effectiveness of knowledge shares like a lack of organizational politics, organizational readiness, language barrier, national culture, and informal relationships. Thus due to willingness, trustworthiness, dissemination capability, and knowledge complexity has a great role in the capability of affecting knowledge share in outsourcing projects by sub-contractual of the telecom expansion project parts.

Medhen Haftom (2019) "assessment of project management practices and challenges: the case of the telecom expansion project in Ethiotelecom" based the found some points. There were gaps in work culture, risk mitigation plans, and response controls in project deployment. There was a problem in vendors and Ethiotelecom sides, inset well-identified plan document and a specific task for divisions not stated well. A project management scientific method is not used well for schedule readjustment. Schedule readjustment had weak on assign tasks and good communication between

divisions or stakeholders of the project managers and team leaders. Lack of coordination and good communication was one of the factors in telecom expansion project implementation. Additionally, there were challenges in government to handle government-owned projects, which take a longer period than baseline, and preparation before a project started. The telecom expansion project was not completed based on the planned budget and scheduled period. So that the study recommended some points, Ethiotelecom to develop a strong work culture and well-organized documentation about previous projects and develop an efficient plan on resources and activities to prevent spent an extra budget and time.

Demoze Demisse (2017) studied "assessment on practices and challenges of consultancy project management: the case of an Ethiopian management institute" explained the main gaps. Ethiopian management institute on plan preparation and implementations guidance orientation, and problems resolving had low performance. Compared consultancy services in the project implementation phase of monitoring and evaluation are weak than others. The main reason for consultancy services problem is due to weak administration on contractual work. The consultancy service management should experience in all consultancies phase and more engage in development such as human resources and facility development, commitment, monitoring, and evaluation system.

2.3 Conceptual Framework

Conceptual frameworks of the study from the literature theoretical and empirical review determined project implementation of different factors. By a combination of these factors the researcher state four independent variables which are organizational culture, managerial capability, technician capability, and project site location and situation for the dependent variable of project performance. Organization culture related to clear path for career advancement, concern for quality work, controlling corruption in the work area, rewards and recognition program genuinely, compensation matches with responsibilities, appropriate recruitment on position staffing, committed management in monitoring and evaluation of the project, concerning cultural difference impact, company encourage creativity, innovation, and continuous improvement as well as employees satisfaction in the company. Managerial capability is the ability to such

interpersonal communication relationship, plan and organize tasks effectively, directing and coordinating employees, managers' knowledge about the technical tasks, quick respond to problem-solving, decisions and follow-up for outcomes, and stability of organizational decisions and actions. The technical adequate capability of a technical worker on self-motivation, communication skills and reporting, multitasking and task priorities on schedule, completing task properly within a time; also it related to academic knowledge background for position, training to develop skill and technical skills related to work. Site location referred to site weather for activities, safe road access to sites, and proper site survey before implementation; situation referred to legal administrative cooperativeness, site security, and social collaboration. Project performance is a summary of such accomplished project at the schedule, implement in quality of standard, the finalized project as planned budget, satisfied Ethiotelecom in project delivery, and develop a better competitive advantage. Based on the literature concept and analysis the below conceptual framework has been constructed.

Independent variables   **Dependent variable**
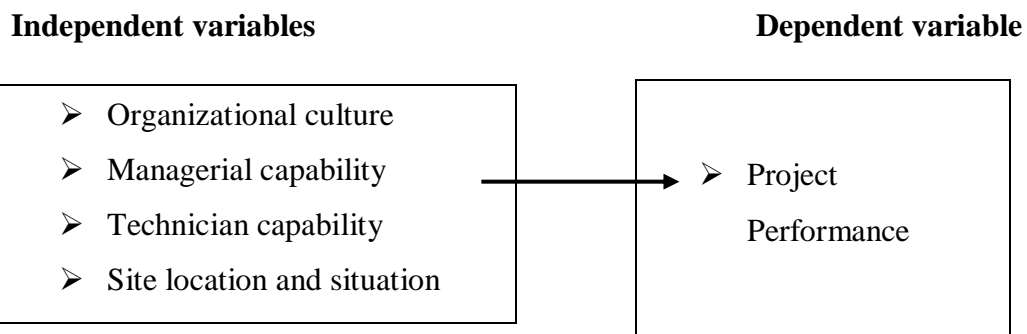
Figure 2. 3: Conceptual framework

Source: Developed by the author based on literatures

CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

This section discusses the way of achieving objectives of the research such as research approach, target population, sampling and data type with source, data collection method, data collection instruments, data analysis method, result in interpretation or presentation methods, and ethical consideration.

3.1 Research Approach

The type of research design undertaken in this study is explanatory. The nature of this study leads towards comparative studies is adopted to investigate the performances in project implementation of two telecom vendors among each other. Collect data and analyses are quantitative. Investigating the relationship of performance for each company with organizational culture and structure practiced strategy, managerial and technical staff, and site location and situation. Then compare two companies' project implementation performance in the expansion project period. The study is also cross-sectional in the sense that relevant data be collected at one point in times which were useful to assess practices, attitudes, knowledge, and beliefs of staff about a particular topic.

3.2 Sources and Types of Data

In the research study, both primary and secondary types of data are used. In the research to getting a better insight, using both data are essential to establish a worthwhile method for the theoretical framework. The primary data source is from Huawei and Ericsson staff's response to desire specific information. Secondary data is written documents for company structure, financial statement, and so on; the sources are annual organization financial reports, websites, published books, journals, and articles from authentic databases.

3.3 Sampling Design

The accuracy of the research survey result assures by a sample size from the research target population. In the (Taherdoost, 2016) explained sampling techniques to gathering respondents' depends on the need and situation. The sample design considers consistency, diversity, and transparency. Confidence reflects real change across consistent and comparable samples in any change that appears in data is

consistency. The sample diversity is representative of the population as diverse as the population itself and sensitive to the local differences that are unavoidable as move across the total population. Transparency is the right perspective in selecting sample size and structure from the total population.

3.3.1. Target Population

The total population of the study is 100staffs in both Huawei and Ericsson companies' staffs participate in the expansion project. The target population for each company is 50staffs include administrative staff and the technical staff.

3.3.2. Sample Size

The sample size is from the total 100staff population in both companies and 50staff in each company. Make a sample size from the target population by using sampling techniques to generalize the whole population by sample amount. The sample size for both companies is the number of respondents of the questionnaire but interviews for top management. An adequate sample size is necessary to describe companies on the project for trust and confidently on the result of research, be out of bias and sample error. Based on (Yamane, 1967) sample size determination formula is $n = N/(1 + Ne^2)$, it represents n= corrected sample size, N = population size, and e = margin of error. From a total of 100staff in Ericsson and Huawei, the calculated sample size is 80, at a 95 % confidence level and 5% precision levels. In the case of a proportional sample size for two companies, the sample size is 40. In the individual case of the total population size is 50staff sampling for each company Ericsson or Huawei, the calculated sample size is 40, confidence level at 95%, and precision levels 5%.

3.3.3. Sampling Technique

The sample size generates from the total population to gather data needs fair distribution. The probability sampling techniques used to collect questionnaire data and non-probability sampling techniques to interview managers. The stratified method of data collection has divided the population into subgroups such as companies, the subgroups divided into two are administrators and technical staff. The random sample is from each subgroup to balance response based on variables and subgroups based on company size. To collect primary data from the total population need sampling

population to the response of the questionnaire that explained by (Yamane, 1967) sampling gives adequate samples, it has a better concern of variation in the whole population.

3.4 Data Collection Method

The data collection is structured and unstructured questionnaires and interview techniques. The standardized questionnaires for organizational cultures through organizational culture assessment instrument distributed for both companies' administrators and technical employees also interviews for top management. The arguments of questionnaires encourage the respondents to be honest since they answer anonymously. Moreover, it can solicit information from several respondents within a short period. It has an advantage for the respondent the scaled items, according to allow the respondents to choose. A Likert scale is a measurement of a statement by classifying a determination level to respondent has the choice to state value for the asked question. It uses to evaluate response by quantitative value on the subjective or objective aspect of need. The levels use to give approximate value more than two 'yes' or 'no' states by assign scales value between agreement and disagreement. In this research, the selected level of measurement is five scale methods to give a response to each statement. These criteria are much better to meet by a visual analog scale it showed by (Reips and Funke, 2008). There may also appear phenomena which even question the ordinal scale level on Likert scales. Likert scale with five scale ranking technique is used by respondents or informants to rank attributes. Secondary data collected from company magazines, websites, journals, or articles for comparability characters.

3.5 Data Analysis and Presentation

The analyses are used to identify problems and performance results from primary and secondary data then discuss analysis values to a representation of finding. Validate and compare hypotheses through the primary data questionnaires and interviews. Secondary data use to analyze and interpret primary data for better findings within the subject. More importantly, it helps to conclude the phenomenon mentioned in primary sources. The data are present and analyze in a way to produce information that can answer basic questions, ensure the objectives of the study, and also show future implications of the research. The descriptive analysis is to describe the behavior of the

individual variables over the period under review by the Statistical Package for Social Science (SPSS). The multiple linear regression using two or more variables can predict the value of the variable. A multiple linear regression finds out the value in an independent variable with dependent variables. Multiple linear regressions to find the value of R, R Square, Pearson Correlation, significance test of the variables.

The t-test analyses are inferential static use to determine the significant difference between the means, standard deviation, and the number of data values of each group. The study hypothesis that is performance comparison in two companies can analyze in a t-test. By determining a p-value, when a p-value is large than 5%, the groups are different else not. It uses to accept or reject the null hypothesis and found a statistically significant difference between the two companies.

Model specification

A regression analysis was undertaken concerning project performance as the dependent variable and the four independent variables; Multiple linear regression analysis was a general statistical technique used to analyze the relationship between a single dependent variable and several independent variables, (Stevenson, 2009). It is one of the most extensively used multivariate statistical techniques for testing hypotheses and predicting values for dependent variables. The regression equation is as:

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

Whereby Y=companies project performance; X1=organizational culture factor, X2=managerial factor; X3=technical capability factor, X4 =site location and situation factor, β1, β2, β3, and β4=Regression coefficients of factors and ε=Error term normally distributed, a mean of 0 and for computation ε is assumed to be 0.

3.6 Research Validity

Validity refers to the conceptual, scientific, and technical soundness of a research study or investigation, and the primary purpose of all forms of research is to produce valid conclusions. Researchers are commonly interested in studying the relationship of specific variables at the stake of other irrelevant, variables. Put simply, validity is related to research methodology because its primary purpose is to increase the accuracy and usefulness of findings by eliminating or controlling as many

confounding variables as possible, which allows for greater confidence in the finding of any given study (Geoffrey, 2008).

The validity of data collection was made by collecting data from the relevant respondents with an introductory letter. The validity of the instruments established by given to experts, a research assistant with experience, and the supervisor who approved the instrument for data collection.

3.7 Reliability

Measurement of reliability is a measurement technique that measures consistency or dependability with the stability of the result over time and across conditions. Geoffrey, (2008) explained easiest form of reliability is a consideration within the relationship between an independent group of results, such as the results on an assessment instrument on two different events. A research reliability instrument performs data yields consistent results after iterate trial by the measure of the degree.

In this study, the reliability instrument used to ensure collected data consistency within the settled research objectives.

Reliability for main variables

According to different authors Cronbach's alpha of less than 0.5 is unacceptable, α less than or equal to 0.6 is poor, α less than 0.7 is questionable, α less than 0.8 and greater than or equal to 0.7 is acceptable, α less than 0.9 and greater than or equal to 0.8 is good and finally α greater than or equal to 0.9 is excellent. All data Cronbach's alpha values are above 0.7 in an acceptable range.

Table 3. 1: Reliability Statistics for main variables

Main variables	Cronbach's Alpha Ericsson	Cronbach's Alpha Huawei	N of Items
Organizational culture	.926	.939	10
Site location and situation	.789	.815	5
Managerial	.917	.902	7
Technical	.871	.875	7
Performance	.880	.734	5

Source: Survey 2020

3.8 Ethical Considerations

In determining the participants of a study, it is ethical to ensure that the research is beneficial for the participants in alleviating a given problem (cress well, 2003). Accordingly, this study is aimed at identifying the challenges in targeting and acquiring the right applicant pool and the majority of the participants are employees who are directly attached to organizational project performance activity of the company and they are the benefited from the result and recommendations of the study.

The researcher briefly explained the purpose of the study to the employees and then participants were included in the research after they gave full consent of their willingness to participate in the study. The researcher assured the confidentiality of the recordings of the interview and no record to be kept about the identity of the participants. A concerted and conscious effort make at all times to uphold the promise. A guarantee gives to the respondents their name would not expose to the research report. The researcher informs the respondents the purpose of the study is for academic purpose. The researcher also not personalizes any of the responses of the respondents during data presentations, analysis, and interpretation.

The correct reporting of the final study result is another ethical issue. The researcher has analyzed the data based on the explicit response of the participants, the notes from observation, and finding from the secondary data. Therefore, it is unfavorable to report a finding that does not follow the good analysis.

CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSIONS

This chapter has focused on presenting the findings of the study, as well as analyzing such findings to enable the user of the study to understand at an in-depth level of the results regarding the research topic, that is, comparison on project performance between Huawei and Ericsson companies in Ethiotelecom expansion project. In the first section, the chapter focuses on providing demographic data regarding the respondents while the second section provides the findings of the specific objectives of the research study. Based on SPSS version 21, the data were analyzed based on descriptive statistics, including tables, frequencies, mean, standard deviation, and coefficient. The research objectives established in chapter one and are to be met in this chapter.

4.1 The Response Rate of the Study

While a total of 80 respondents were targeted in the study, which included managers, supervisors, coordinator, and site engineers and other staffs only 73 respondents were able to return complete questionnaires 35 from Huawei and 38 from Ericsson, which were taken to be sufficient to carry out an analysis on the data. This resulted in a response rate of 91%. This response rate was considered sufficient to establish conclusions regarding the research study. Based on the research by, Cooper, D., & Schindler, (2006) a response rate of fifty percent is sufficient to carry out an analysis and report the results, however, a rate of sixty percent is considered good while that of seventy percent or more is deemed exceptional. In this regard, the response rate of this study was outstanding.

4.2 Demographic Data

The demographic data is crucial in understanding whether the given sample of the respondents in a specific research study represents sufficiently the target population. The demographic data also enables the researcher to find out the suitability of the respondents in providing answers to the research questions to generalize the results of the study. In this research, the demographic data consisted of gender, age, level of education, and work experience of the respondents.

Table 4. 1: Background information of respondents from Huawei and Ericsson

Item	Response	Frequency		Percent	
		Huawei	Ericsson	Huawei	Ericsson
Gender	Female	4	9	11.4%	23.7%
	Male	31	29	88.6%	76.3%
Age	<25				
	25-35	9	12	25.7%	31.5%
	36-45	25	26	71.4%	68.5%
	Above 45	1		2.8%	
Education	Diploma				
	BSc	26	33	74.3%	86.8%
	Masters & above	9	5	25.7%	13.2%
Experience	<3 years	13	23	37.2%	60.5%
	3-6 years	17	11	48.6%	29%
	7-10 years	4	3	11.4%	7.9%
	Above 10years	1	1	2.8%	2.6%

Source: Survey, 2020

Created on the above table 4.1, the respondents were asked to indicate their gender in the questionnaire. Accordingly respondents in the study, there were more male than female in both companies; in Huawei (88.6%) and female (11.4%), in Ericsson 76.3% of male and 23.7% of female. Table 4.1 emphasizes the fact that the company's employees were highly dominated by male employees. Based on the above table 4.1, most of the respondents were aged between 25-35(25.7%), 36-45(71.4%), above 45 years (2.8%), in Huawei and 25-35(31.5%), 36-45(68.5%) in Ericsson and this majority of personnel providing service in both companies are concentrated in the age group of between 25-35 and 36-45.

However, given the fact that all age categories were represented in this study, the results of the study were considered to be significant for generalization purposes as individuals who were recently educated in the field with a high level of experience were able to participate in the study. The above table 4.1 also indicates that a majority of the respondents have first Degree (74.3%) and 25.7% masters holders in Huawei

and first-degree holders (86.8%) and masters holders (13.2%) in Ericsson. The majority of the respondents were well educated and able to respond to the questionnaires without difficulties. As provided by table 4.1, a majority of the respondents in the population had to work for the period of between <3years (37.2%), 3-6 years (48.6%), 7-10 years (11.4%), and above 10 years (2.8%) in Huawei and <3years (60.5%), 3-6 years (29%), and 7-10 years (7.9%), and above 10 years (2.6%) in Ericsson.

4.3 Descriptive Statistics

The term descriptive statistics deals with collecting, summarizing, and simplifying data. It seeks to achieve this in a manner that meaningful conclusions can be readily drawn from the data. In this study, descriptive statistics specifically required to measure the level of the independent variables and the dependent variable. The responses were captured on a 5-point Likert scale ranging from 1-strongly disagrees to 5-strongly agree, 35 respondents of Huawei and 38 respondents of Ericsson. The mean and standard deviations of these responses were calculated to determine the mean level of the variable and its variability (standard deviation, SD).

4.3.1 Analysis of Organizational Culture

The study sought to investigate the influence of organizational culture factors on project performance in the Ethiotelecom expansion project, to identify the relationship between two variables questioner segregate to both company employees and managers. In this factor, the ten questions rose for the respondents in the Likert scale and based on the response the following point presented mean and standard deviation values.

Table 4. 2: Statistics for organizational culture factor

Items	Huawei		Ericsson	
	Mean	Std.	Mean	Std.
Employees satisfaction in the company	3.3714	1.08697	3.5789	0.97625
Clear path for career advancement	3.1142	1.10537	2.9737	1.10250
Company concern for quality work	2.6571	1.05560	3.3421	1.21425
Controlling corruption in work area	2.6857	1.13167	3.7368	0.92076
Rewards and recognition program genuinely	3.9714	0.98476	2.4211	1.05604
Compensation matches with responsibilities	3.200	1.07922	3.5263	0.89252
Appropriate recruitment on position staffing	3.4571	1.12047	3.1053	0.95265
Committed management in monitoring and evaluation of project	4.0571	0.90563	2.3421	1.07241
Concerning cultural difference impact	3.8571	1.24009	3.1052	1.01763
Company encourage creativity, innovation, and continuous improvement	3.2286	1.08697	3.2368	1.10347

Source: Survey, 2020

In table 4.2 state descriptive statistics data for organizational culture factor within ten items. An employee satisfaction in the company, the respondents mean value 3.57 in Ericsson and 3.37 in Huawei. In a clear path for career advancement the respondents the mean value of 2.97 of Ericsson and 3.1 of Huawei, this implies a little bit difference Huawei has a good career structure. The respondent's mean value of 3.34 for Ericsson and 2.66 for Huawei was rated for the company concerning the quality of work. Ericsson highly involves in quality rather than Huawei. The controlled corruption in work area according to the respondents the mean value of 3.74 of

Ericsson and 2.68 of Huawei, this implies Ericsson was a higher in corruption controlling mechanism but not means successfully controlled because it should interpret in terms of money. The respondent for rewards and recognition program and implement genuinely, they were rated mean value in Ericsson 2.42 and Huawei 3.97, it indicated Huawei was higher in a lot of difference on rewarded and awarded benefit based on employee performance. Compensation matches with responsibilities mean values 3.53 of Ericsson and 3.2 of Huawei, for the same position of job title payment, wage, allowance, and overtime, Ericsson compensate well rather than Huawei. The respondents answered for management related organizational culture attributes for appropriate recruitment on position staffing the mean values of Ericsson 3.1 and Huawei 3.46, it indicates both companies recruitment specification for position around neutral even if Huawei a higher. Committed management in monitoring and evaluation of project the respondents were rated mean value 2.34 in Ericsson and 4.06 in Huawei, it implies a level of commitment in monitoring and evaluation Huawei a higher above agree on the level. Concerning cultural difference impact-rated mean values of by respondents were 3.1 in Ericsson and 3.89 in Huawei; it indicates Huawei more concentrated on diversity culture flexibility. The company encourages creativity, innovation, and continuous improvement was rated by respondents mean values were 3.24 of Ericsson and 3.22 of Huawei; both companies respondents around neither agree nor disagree level. The standard deviation for the organizational culture factor construct ranged between 1.21-0.89 for Ericsson and 0.90-1.24 for Huawei which show a high level of variance.

4.3.2 Analysis Managerial Capability

To examine managerial capability factors, seven questions were asked on the questionnaire on the Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) for both company employees and managers. The respondents were providing an answer to each question related to their company on the below table 4.3 describe mean and standard deviation values.

Table 4. 3: Statistics for managerial capability factor

Items	Huawei		Ericsson	
	Mean	Std.	Mean	Std.
Interpersonal communication	3.5143	1.17251	3.3158	1.01623
Planning and organizing tasks effectively	3.800	0.99410	2.5263	1.17948
Directing and coordinating employees	3.6571	1.10992	2.3947	.97369
Managers knowledge about technical Job	3.6571	1.02736	3.5789	0.82631
Quick response to problem solving	3.600	1.00587	2.3684	1.02459
Decisions and follow-up for outcomes	3.9143	1.09468	2.5526	0.95003
Stability of organizational decisions and actions	2.8857	1.25491	2.3421	1.19178

Source: Survey, 2020

According to table 4.3 managerial factor items the respondents for the first item interpersonal communication relationship rated mean values 3.31 of Ericsson and 3.51 of Huawei, this indicates good communication in Huawei rather than Ericsson.

In the second item of planning and organizing tasks effectively rated mean values were 2.53 of Ericsson and 3.8 of Huawei, this implies effectively planning and organizing tasks Huawei was a higher mean. For the third item of directing and coordinating employees the respondent's mean values were 2.39 for Ericsson and 3.6 for Huawei, in a lot of difference Huawei has a higher mean in directing and coordinating employees. The fourth item of management understanding about technical jobs of the project the respondents rated mean values 3.97 of Ericsson and 3.14 of Huawei; Ericsson managers had higher detail knowledge for technical work than Huawei. In the fifth item of quick response to problem-solving the respondents were rated mean values were 2.37 in Ericsson and 3.6 in Huawei, Huawei quickly responded to problems than Ericsson. The sixth item of decisions and follow-up for progress rated by the respondents were 2.55 for Ericsson and 3.9 for Huawei, which

indicates Huawei good follow-up of progress and made decisions. In the last item of stability of organizational decisions and actions, the respondent's rated mean values were 2.34 at Ericsson and 2.88 at Huawei. Stability of organizational decisions and actions in Ericsson higher a little bit from the disagreed level but Huawei's approach to the neutral level. The standard deviation ranged between 0.82-1.19 at Ericsson and 0.99-1.25 at Huawei this indicates there is some level of variance from the mean value.

4.3.3 Analysis Technical Capability

To analyze technical capability factors seven questions were raised on the questionnaire in Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) for both company Ericsson and Huawei employees response mean and standard deviation values shown on below table 4.4.

Table 4. 4: Statistics for technical capability factor

Items	Huawei		Ericsson	
	Mean	Std.	Mean	Std.
Technical worker self-motivation	2.9714	1.15008	3.1053	1.33132
Skill trainings increase staff performance	3.200	1.15809	3.3684	1.17222
Communication skills and reporting	3.2857	1.01667	3.4211	1.03013
Multitasking and task priorities on schedule	3.0286	1.20014	2.6053	1.15172
Technological skills related to work	3.2857	1.15227	3.4474	1.10765
Background academic knowledge for position	3.5143	1.35845	3.8421	1.07870
Completing task properly and at a time	4.0857	0.95090	2.5263	1.20218

Source: Survey, 2020

According to the data for technical worker self-motivation, the respondent was rated mean values 3.1 at Ericsson and 2.9 at Huawei, both companies technical worker self-motivation around the neutral level. In training increase skill technical worker performance the respondents were mean value 3.37 of Ericsson and 3.2 of Huawei, this implies little bit difference Ericsson have skilled by training. The respondent's

mean value 3.42 of Ericsson and 3.28 of Huawei were rated for communication and reporting skills, Ericsson worker some extent higher involves for quality rather than Huawei. Multitasking and task priorities on schedule according to the respondents the mean value of 2.6 of Ericsson and 3.03 of Huawei, this implies Huawei was has a higher mean in multitasking and task priorities on schedule. The respondents for technological skills related to work were rated mean value in Ericsson 3.45 and in Huawei 3.28, which indicated Ericsson was higher technological skills related to work. The respondents for Background academic knowledge for position rated of mean values were 3.84 at Ericsson and 3.51 at Huawei, for job title fitted specific academic background Ericsson match more. The respondents rated for completing task properly and at a time the mean values were 2.53 at Ericsson and 4.09 at Huawei, Huawei highly differs in completing task properly and at a time than Ericsson. On the other hand, the level of a technical factor of the standard deviation ranged between 1.03-1.33 in Ericsson and 1.35-0.95 in Huawei, which show a high level of variance.

4.3.4 Analysis Site Location and Situation

According to the table presented below To examine site location and situation factors five questions were raised on the questionnaire in Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) for both company employees and managers. The respondents were answered each question related to their project sites location and situation items mean and standard deviation values.

Table 4. 5: Statistics for site location and situation factor

Items	Huawei		Ericsson	
	Mean	Std.	Mean	Std.
Suit weather for activities	3.400	1.21752	3.2368	1.21776
Safe road access to sites	3.1143	1.13167	2.9737	1.10250
Site security and society collaboration	2.9143	0.98134	3.00	1.25203
Proper site survey before implementation	3.5714	0.88403	2.6579	1.02077
Legal administrative bureaucracy impact	2.7714	1.00252	2.7632	1.02494

Source: Survey, 2020

According to the site location and situation factor above table 4.5 above, the respondents for suit weather for activities rated mean values were 3.24 at Ericsson and 3.4 at Huawei, both vendors sites suitable climate or weather condition was more similar and medium level. In the second item of safe road access to sites the respondents' rated mean values 2.97 at Ericsson and 3.11 at Huawei; this indicates the respondents neutral for road infrastructure of the country. For site security and social collaboration, 3.0 by Ericsson and 2.91 by Huawei rated of the respondents. Proper site survey before implementation the respondents were 2.66 at Ericsson and 3.57 at Huawei, this implies Huawei proper site survey before implementation did but Ericsson rose to complain due to survey not done by them, it did by Huawei. Legal administrative cooperativeness items the respondents rated were similar under the neutral level that rated 2.76 at Ericsson and 2.77 at Huawei. The Mean for site location and situation factor the standard deviation ranged between 1.02-1.25 at Ericsson and 0.88-1.13 at Huawei, this indicates there is some level of variance from the mean value.

4.3.5 Level of Companies' Project Performance

To measure project performance in telecom expansion project taken five measurement items such as accomplish project at schedule, implement in quality of standard, finalized as planned budget cost, satisfied Ethiotelecom in project delivery, and develop better competitive advantage. The descriptive values presented in table 4.6 shows a level of the achievements on project implementation objectives according to respondent perspectives with a Likert scale of very dissatisfied, dissatisfied, neutral, satisfied, and very satisfied.

Table 4. 6: Statistics for project performance

Items	VS%		S%		N%		D%		VD%	
	Ericsson	Huawei	Ericsson	Huawei	Ericsson	Huawei	Ericsson	Huawei	Ericsson	Huawei
Accomplish project at schedule	5.7	23.7	17.1	39.5	34.3	21.1	25.7	10.5	17.1	5.3
Implement in quality of standard	25.7	7.9	31.4	21.1	20.0	28.9	14.3	23.7	8.6	18.4
Finalized as planned budget cost	2.9	21.1	11.4	31.6	22.9	23.7	34.3	15.8	28.6	7.9
Satisfied Ethiotelecom in project delivery	8.6	23.7	17.1	31.6	34.3	21.1	25.7	18.4	14.3	5.3
Develop better competitive advantage	5.7	7.9	14.3	23.7	28.6	34.2	31.4	23.7	20.0	10.5

Source: Survey, 2020

On above table 4.6, an accomplished project at schedule period item, the respondent's answered show, 23.7% of Ericsson and 5.7% of Huawei are very satisfied, 17.1% of Huawei and 39.5%(highest value) of Ericsson moderate satisfied, 21.1% of Ericsson and 34.3% (highest value) of Huawei the respondents neither satisfied nor dissatisfied, 10.5% of Ericsson and 25.7% of Huawei dissatisfied, and 5.3% of Ericsson and 17.1% of Huawei very dissatisfied on their accomplished project at schedule period. The implemented project in standard quality 7.9% of Ericsson and 25.7% of Huawei are very satisfied, 21.1% of Ericsson and 31.4% of Huawei presents respondents are satisfied, 28.9% of Ericsson and 20.0% of Huawei are neutral, 23.7% of Ericsson and 14.3% of Huawei the respondents are dissatisfied, and 18.4% of Ericsson and 8.6% of Huawei very satisfied. The third item of finalized project as planned budget cost objectives the respondents are 21.1% of Ericsson and 2.9% of Huawei are very satisfied, 31.6% of Ericsson and 11.4% of Huawei are satisfied, 23.7% of Ericsson and 22.9% of Huawei are neutral, 15.8% of Ericsson and 34.3% of Huawei are dissatisfied, and 7.9% of Ericsson and 28.6% of Huawei very dissatisfied. In the project delivery satisfy to client or Ethiotelecom, shows from the respondents

are 23.7% of Ericsson and 8.6% of Huawei very satisfied, 31.6% of Ericsson and 17.1% of Huawei satisfied, 21.1% of Ericsson and 34.3% of Huawei neutral, and 18.4% of Ericsson and 25.7% of Huawei dissatisfied, and 5.3% of Ericsson and 14.3% of Huawei very dissatisfied on achievements of quality project delivery. In the development of better competitive advantage, the respondents are 7.9% of Ericsson and 5.7% of Huawei very satisfied, 23.7% of Ericsson and 14.35 of Huawei satisfied, 34.2% of Ericsson and 28.6% of Huawei neutral, 23.7% of Ericsson and 31.4% of Huawei satisfied, and 10.5% of Ericsson and 20.0% of Huawei very dissatisfied on development of competitive advantage achievements.

Table 4. 7: Statistics of project performance mean and standard deviation

Items	M		SD	
	Ericsson	Huawei	Ericsson	Huawei
Accomplish project at schedule	3.3143	2.3421	1.13167	1.12169
Implement in quality of standard	2.4857	3.2368	1.26889	1.21776
Finalized as planned budget cost	3.7429	2.5789	1.09391	1.22213
Satisfied Ethiotelecom in project delivery	3.2	2.5	1.15809	1.20247
Develop better competitive advantage	3.4571	3.0526	1.14642	1.11373

Source: Survey, 2020

On the other hand table, 4.7 indicate the mean and standard deviation for each item. According to respondents rated accomplished project at schedule the Huawei mean value of 3.31 and Ericsson mean value of 2.34. The companies achieved project in standard quality of Ericsson mean value is 3.23 rather than Huawei mean value of 2.48. The finalized project as planned budget cost, even if Huawei's mean values of 3.74 higher than the 2.57 mean value of Ericsson. The project delivery satisfaction for the client means value 2.5 of Ericsson and 3.2 of Huawei. Both companies to develop a better competitive advantage have closer achievement based on the mean value 3.05 of Ericsson and 3.45 of Huawei. The standard deviation range is between 1.22 to 1.11 for Ericsson and 1.09 to 1.26 for Huawei, which show some level of variance from the mean value.

4.4 Correlation Analysis

A correlation analysis was conducted to establish the relationship between the independent and dependent variables; this helped to test the hypotheses of the study and show the degree of relationship between the independent and dependent variables. The purpose of doing correlations was to allow the study to predict how a variable deviates from the normal. Pearson r coefficient was used to determine if there was a significant, positive association between each independent variable and project performance. Pearson r is a measure of the degree of association between two variables which are both measured in either the interval or ratio scale. Its value ranges from -1.0 to +1.0, with bigger absolute values indicating a stronger relationship; the sign denotes the direction of the association. A positive correlation indicates that as one variable increases, the other also goes up; meanwhile a negative correlation suggests that as one variable increases, the other correspondingly goes down (Saunders et.al, 2009).

Table 4. 8: Guideline on Strength of Relationship R-Value

Values range	Interpretation
0.39 and below	Low positive association
0.4 to 0.69	Moderate positive association
0.7 to 0.99	A high positive association

The Pearson correlation between independent variables organizational culture factor, managerial factor, Technical factor, site location, and situation factor and the dependent variable project performance are depicted below table.

Table 4. 9: Correlation analysis between factors and Ericsson performance

		Performance		Organizational culture		managerial capability		Technical capability		site location, and situation	
		Huawei	Ericsson	Huawei	Ericsson	Huawei	Ericsson	Huawei	Ericsson	Huawei	Ericsson
Performance	Pearson Correlation	1	1	.885**	.475**	.724**	.805**	.874**	.731**	.392*	.697**
	Sig. (2-tailed)			.000	.003	.000	.000	.000	.000	.020	.000
Organizational culture	Pearson Correlation	.885**	.475**	1	1	.829**	.405*	.845**	.097	.365*	.292
	Sig. (2-tailed)	.000	.003			.000	.012	.000	.562	.031	.075
managerial capability	Pearson Correlation	.724**	.805**	.829**	.405*	1	1	.707**	.636**	.317	.503**
	Sig. (2-tailed)	.000	.000	.000	.012			.000	.000	.063	.001
Technical capability	Pearson Correlation	.874**	.731**	.845**	.097	.707**	.636**	1	1	.312	.665**
	Sig. (2-tailed)	.000	.000	.000	.562	.000	.000			.068	.000
site location, and situation	Pearson Correlation	.392*	.697**	.365*	.292	.317	.503**	.312	.665**	1	1
	Sig. (2-tailed)	.020	.000	.031	.075	.063	.001	.068	.000		
**. Correlation is significant at the 0.01 level (2-tailed).											

Correlation analysis between organizational culture and project performance

Pearson correlation test was conducted to see the degree of relationship between the independent variable organizational culture factor and project performance. The results of the correlation between these variables are shown in table 4.9 above; there is a significant correlation between organizational culture factors and project performance. On other hand, project performance has a moderate relationship with

organizational culture factors in case of Ericsson (r=0.475 with p<0.05) and in case of Huawei(r=0.885 with p<0.05) has strong relationship.

Correlation analysis between managerial factor and project performance

Pearson correlation test was conducted to see the degree of relationship between the independent variable managerial factor and project performance. The results of the correlation between these variables are shown in the table above; there is a significant correlation between the managerial factor and project performance. On another hand, project performance has a strong relationship with the managerial factor (r=0.805 with p<0.05) of Ericsson and (r=0.724 with p<0.05) of Huawei.

Correlation Analysis between Technical factor and project performance

Pearson correlation test was conducted to see the degree of relationship between the independent variable technical factor and project performance. The results of the correlation between these variables are shown in the table above; there is a significant correlation between the technical factor and project performance. On another hand, project performance, has strong relationship with technical factors Ericsson (r=0.731 with p<0.05) and Huawei (r=0.874 with p<0.05).

Correlation Analysis between site location and situation factor and project performance

Pearson correlation test was conducted to see the degree of relationship between the independent variable site location and situation factor and project performance. The results of the correlation between these variables are shown in the table above; there is a significant correlation between site location and situation factor and project performance. On another hand, project performance has a moderate relationship with site location and situation factor, Ericsson (r=0.697 with p<0.05) and Huawei (r=0.392 with p<0.05).

4.5 Regression Analysis

Multiple linear regression analysis is a well-known statistical technique that fits a relationship between one dependent and more than one independent variable. Accordingly, model summary, an analysis of variance (ANOVA), and regression coefficient for the dependent variables were discussed under this sub-section. In this subsequent section on regression results, the coefficient of determination (R square)

was used as a measure of the explanatory power to show how the independent variables explain the dependent variable. The F statistics (ANOVA) was used as a measure of the model goodness of fit. Pearson correlation and the regression coefficient summary were used to explain the nature of the relationship between the dependent and independent variables. The significance levels of the regression results were also taken into account for proper interpretations (Gay, Mills, & Airasian, 2006).

Multiple Linear Regressions for all Variables

Regression analysis was conducted to empirically determine whether the independent variable was a significant determinant of project performance.

Table 4. 10: Model Summary

Model	R	R Square	Adjusted R Square	Std. The error of the Estimate
Huawei	.939[a]	.882	.866	.29531
Ericsson	.900[a]	.810	.787	.29327

The study aimed at finding out the overall effect of the independent variables that are organizational culture factor, managerial factor, technical factor, and site location and situation factor on project performance. The model $Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \varepsilon$ explained the variations in project performance as shown in Table 4.10. This showed that organizational culture factor, managerial factor, technical factor and site location, and situation factor for Huawei 86.6% and Ericsson 78.7% of the variation in project performance.

Table 4. 11: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
Huawei	Regression	19.555	4	4.889	56.060	.000[b]
	Residual	2.616	33	.087		
	Total	22.171	37			
Ericsson	Regression	12.110	4	3.028	35.202	.000[b]
	Residual	2.838	33	.086		
	Total	14.948	37			

From above table 4.11, it is apparent that the regression model was significant using between the independent factors and project performance. An F statistic of 56.060 for Huawei and 35.202 for Ericsson and both the probability value of 0.000 clearly indicate that the independent factors were significant.

Table 4. 12: Coefficients of multiple linear regressions

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.073	.171		.326	.006
Huawei Organizational culture	.339	.101	.365	2.216	.003
Huawei Managerial	.291	.085	.314	2.448	.000
Huawei Technical	.204	.085	.219	1.673	.016
Huawei Site location and situation	.100	.079	.099	.715	.028
(Constant)	.103	.304		.340	.736
Ericsson Organizational culture	.218	.093	.209	2.360	.024
Ericsson Managerial	.330	.087	.419	3.810	.001
Ericsson Technical	.237	.099	.290	2.378	.023
Ericsson Site location and situation	.196	.090	.232	2.174	.037

In this study, four explanatory variables were identifying to determine a significant difference in project performance at a 5% level of significance; the above table 4.12 shows the factor relation rate.

The estimated regression model was

$$Huawei\ project\ performance$$
$$= 073 + .339 Organizational\ culture\ factor$$
$$+ .291\ Managerial\ factor + .204 Technical\ factor$$
$$+ .100 Site\ location\ and\ situation\ factor + \varepsilon$$

$$Ericson\ project\ performance$$
$$= .103 + .218 Organizational\ culture\ factor$$
$$+ .330\ Managerial\ factor + .237 Technical\ factor$$
$$+ .196 Site\ location\ and\ situation\ factor + \varepsilon$$

Hence, the coefficient explains the average amount of change in the dependent variable that is caused by a unit of change in the independent variable. Accordingly, the unstandardized beta coefficients (β) tell the unique contribution of each factor to the model. A small p-value (<0.05) indicates the predictor variable has made a

statistical significance contribution to the model. On the other hand, a high p-value (p >0.05) indicates the predictor variable has no significant contribution to the model (George and Mallery, 2003). Table 4.12 shows all the p-value for independent variables are less than 0.05 and all the β values are positive, which shows the organizational culture factor, managerial factor, technical factor, and site location and situation factor have a positive effect on project performance.

The results of the Multiple Regression, as presented in table 4.12 above, revealed that the organizational culture factor has a positive and significant effect on both company's project performances, Huawei with β= 0.339, and Ericsson β=0.218, at a 95% confidence level (p<0.05). The Beta value (β) of 0.339 (33.9%) and 0.218 (21.8%) shows that if there is one unit increase in involvement, it was an increase in Huawei and Ericsson project performance respectively. Therefore, organizational culture has a positive effect on project performance in expansion project implementation.

In the same way managerial factor; has a positive and significant effect on project performance with β= 0.291 of Huawei and β=0.330 of Ericsson, at 95% confidence level (p<0.05). The Beta value (β) of 0.291 (29.1%), and 0.330 (33.0%) shows that if there is one unit increase in involvement, it was an increase in Huawei and Ericsson project performance respectively. Therefore, the managerial factor has a positive effect on project performance in expansion project implementation.

Similarly Technical has a positive statistically significant effect on project performance with β= 0.204 of Huawei and 0.237 of Ericsson, at 95% confidence level (P<0.05). The Beta value (β) of 0.204 (20.4%) and 0.23.7 (23.7%) shows that if there is a one-unit increase in Technical factor, that was an increase in Huawei and Ericsson project performance respectively. This indicates that the technical factor has a positive statistically significant effect on project performance in expansion project implementation.

Likewise, the site location and situation has a positive and significant effect on project performance with β=0.100 of Huawei and 0.196 of Ericsson, at 95% confidence level (P<0.05). The Beta value shows that if there is a one-unit increase in site location and situation that was a 10.0% and 19.6% increase on Huawei and Ericsson project

performance respectively. Therefore, site location and situation factors have a positive effect on project performance in expansion project implementation.

In general from the regression analysis, the higher the absolute value of the beta coefficient of the variables, the higher the contribution that the independent variables have on the dependent variable. Therefore, the organizational culture factor has the highest contribution in Huawei (β=0.339, P<0.05) and the managerial factor has the highest contribution in Ericsson (β=0.330, P<0.05) on project performance, then fourth-factor site location and situation was the least positive effect on both companies project performance.

4.6 T-Test Analysis

A paired-t-test is statistically more significant and powerful than the independent-groups t-test, so that paired t-test is preferred than an independent group's t-test. Because paired samples t-test depends on an error term in the t-test, does not depend on the mean difference. In the article by Cooper & Schindler (2006), the mean difference among two independent variables is the same in paired samples t-test or independent-groups. A paired samples t-test subject statistical analyses is more powerful than an independent-groups t-test, smaller in the error term. If there is no correlation among the two-state levels of the independent variables, and a paired t-test is powerful as an independent group's t-test. Both an independent group's t-test and a paired samples t-test are a ratio of the mean difference divided by an error term among levels. Non-directional alternate hypotheses are stated in the paired samples t-test as independent-groups t-test hypotheses.

A paired-t-test is describing statistics levels for each independent variable by analyzing correlation with the Pearson correlation. States by George and Mallery, (2003) the results of the paired-samples t-test evaluated the statistical significance of the mean difference among paired samples, differences among the standard deviations, differences among the standard error, the confidence boundaries interval, and the t-value, p-value (Sig.), and degrees of freedom. Paired t-test t equation given by:

$$t = \frac{(\sum \Delta M)/N}{\sqrt{\frac{\sum \Delta M^2 - (\frac{(\sum \Delta M)^2}{N})}{(N-1)N}}}$$

The paired-t-test samples have done among five measurement items, each determinant item to determine the existence of a significant difference between Ericsson and Huawei in implementation project performance on the expansion project in every five items.

Table 4. 13: Project performance t-test analysis between Ericsson and Huawei

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Accomplish project at the schedule	Ericsson1 - Huawei1	-1.6000	.65079	.11000	-1.82355	-1.37645	-14.545	34	.000
Implement in quality of standard	Ericsson2 - Huawei2	.74286	.50543	.08543	.56923	.91648	8.695	34	.000
Finalized as planned budget cost	Ericsson3 - Huawei3	-1.6571	.63906	.10802	-1.87667	-1.43762	-15.341	34	.000
Satisfied Ethiotelecom in project delivery	Ericsson4 - Huawei4	-1.0857	.56211	.09501	-1.27881	-.89262	-11.427	34	.000
Develop a better competitive advantage	Ericsson5 - Huawei5	-.42857	.55761	.09425	-.62012	-.23703	-4.547	34	.000

A paired t-test has done for Ericsson and Huawei project implementation performance, the result shows all five items have a significant mean difference among them by p<0.001 level. The first item means value for accomplish project at the scheduled period is -1.6; it means Huawei has a higher mean. In the second item of performing the project in quality, the mean difference value is 0.74; it means Ericsson has a higher mean. In the third item of the finalized project within the planned budget the mean difference value is -1.66; it implies Huawei has a higher mean than Ericsson. In the fourth item of satisfying client Ethiotelecom in project delivery the

mean difference value is -1.08, which shows Huawei has a higher mean rather than Ericsson. In the fifth item, the mean difference value is -0.43; to develop competitive advantages through project implementation, this value is closer result relative to other measurement items even if Huawei has a higher mean value. In all project performance measurement items, Huawei has higher than Ericsson means except performing the project in quality.

According to five project performance measurement items, there are significant differences between Ericsson and Huawei within $p < 0.001$. the first item of the accomplished project at the schedule the t value of -14.545 or Huawei higher by 14.5%, in second item implement project in the standard set of quality the t value is 8.695 or Ericsson higher by 8.7%, third items of the finalized project within planned budget the t value is -15.341 or Huawei higher by 15.3% based on the plan, in the fourth item of satisfied client in project delivery the t value is -11.427 or Huawei higher by 11.4%, and in the last item of developing a better competitive advantage, the t value is -4.547 or Huawei higher by 4.5%.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

This chapter contains the main findings within conclusions, recommendations, and further research direction based on the findings out of the study.

5.1   Conclusions

Generally, the telecommunication industry is one of the large economic sectors, so that operators deploy the latest network infrastructure technology to compete and to generate revenue with cost-effective deployment. Ethiopian operator Ethiotelecom deployed expansion 2G/3G/4G networks project with ZTE, Huawei, and Ericsson international vendors. The research study is on the selected Ericsson and Huawei vendors, analyzed by each company respondents were rated.

In the investigation of the relationship between project implementation factors and the project performance, aggregate mean values for organizational culture factor 3.13 in Ericsson and 3.68 in Huawei, for managerial capability factor 2.72 in Ericsson and 3.57 in Huawei, for technical capability factor 3.18 in Ericsson and 3.33 in Huawei, and for site location and situation factor 2.92 in Ericsson and 3.15 in Huawei. In Huawei the correlation analysis between project performance and factors has a positive significant relationship, in order to organizational culture (0.885), technical (0.874), managerial (0.724), and site location and situation (0.392) of correlation coefficient and multiple linear regression beta coefficients for organizational culture factor (β=0.339) has the highest contribution on project performance, then followed by a managerial factor (β=0.291), technical factor (β=0.204), and site location and situation factor (β=0.100), at confidence level p<0.05. In Ericsson the correlation analysis has a positive significant relationship between project performance and implementation factors, in order to managerial (0.805), technical (0.731), site location and situation (0.697), and organizational culture (0.475) and in multiple linear regression managerial factor has the highest contribution (β=0.330) on project performance, then followed by a technical factor (β=0.237), organizational culture factor (β=0.218), and site location and situation factor (β=0.196), at confidence level p<0.05. These project implementation factors has a positive and meaningful

relationship, it's highly influence both vendors project performance but factors level of influence differ vendor to vendor

The aggregate mean value of project performance is 3.2 in Huawei, and 2.74 in Ericsson. The mean difference from Ericsson to Huawei for "accomplish the project at the schedule," "implement in quality of standard," "finalized as planned budget cost," "satisfied client in project delivery" and "develop better competitive advantage" were -1.6, 0.74, -1.66, -1.08 and -0.43, respectively. According to paired t-test significant differences from Ericsson to Huawei in five project performance evaluation measurements items; for accomplished project at the schedule the t value is -14.545, implement in quality of standard the t value is 8.695, finalized as planned budget cost the t value is -15.341, the satisfied client in project delivery the t value is -11.427, and develop a better competitive advantage the t value is -4.547, at confidence level $p < 0.001$. Based on results, Ericsson delivers quality projects rather than Huawei, and as reverse Huawei delivered in the scheduled period rather than Ericsson. Also, they had not afforded significant differences in competitive advantage through the project, but after the project both tried to get it by making a free cost training center.

The project implementation factors has a positive relationship in the project performance means that indicates network infrastructure project require engaging in analyzing these project implementation factors and changes occur during project implementation should be adopted new strategy. When making a project, vendor management should give attention and be very effective in taking cognizance on these factors and other numerous network deployment project factors that influence the project activities and performance. It needs a higher attachment to project implementation factors to perform better achievement of an organizational goal, thereby creating a strategic fit where they deploy, when an implementation. Generally the study findings for better project performance requirements are prepare specific detail plan before deploy within consider of site condition and client interest, recruit right person for right position, synchronize working culture, develop employees capability, genuinely giving incentive and recognition based on employees performance, proper resource and task organizing, create effective site environment and situation adaptability strategy, and evaluate project implementation process from start up to delivery with taking proactive corrective action.

5.2   Recommendations

The recommendations are derived from the finding results, and conclusions of the research study. It's forwarded as a means to resolve and use as an input to avoid common mistake for related project implementation purpose:

I.   The vendors should give attention to align what is going on in their project implementation factors on the aspects of project performance that leads to higher achievement of schedule, budget, project delivery, quality, and competitiveness.

II. Ethiotelecom should need to corporate in various supports to provide vendors in sharing the ground information, sharing previous project performance, opportunities, challenges with problem resolving way, and closely work with local administrators and societies to avoid bureaucracy. Because reduction of vendors' performance also affects clients (Ethiotelecom) in case of quality, return on investment, telecom user satisfaction, and expose to additional cost.

III. For country economic development government should improve safe infrastructures, secure project areas, and legal administrative cooperativeness.

IV. Company managers should be examines and develops their capability on network implementation management, organizational culture, technical skill, and way of adopting the environment.

V.   When an Engineer works on as project manager also should have project management skills, and company should investment on quality management to deliberately promote cost efficient and business competitive advantages.

5.3   Future Research Direction

This study was despite the contributions focused on some points due to time, resource, and methodological constraints. Thus, it is highly recommended if the following points are assessed on future researches may attempt to achieve a more comprehensive understanding of telecom network project implementation factors on performance. In this study telecom project implementation performance was assessed using two selected vendors, for further analysis with a broad scope such as including the third vendor ZTE in the expansion project, SME civil work, Ethiotelecom project team, sub-contractual teams, and financial statements of a vendor and client will give better finding out to be significant.

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Appendices 1: Questionnaire

Jimma University

College of Business and Economics

School of Graduate Studies

A questionnaire to be filled by employees

The title of the study is the Comparison of Ericsson and Huawei project Implementation performance in the Ethiotelecom expansion project. The general objective of this study is to understand the relation between performance on the project implementation with organization culture, site location, and situation, technical, and administrator staff performance and compare both company performances. The research findings would serve as a source of information for vendors, Ethiotelecom, other researchers, and practitioners. The study is for undertaken an academic purpose only. Your responses are confidential.

Thank you in advance for your collaboration to fill the questionnaire honestly and sincerely with the sacrifice of your precious work time.

Researcher's contact address: Email address dpiniel@gmail.com

PART I: Personal information and relationship to the Company

1. Sex   ☐ Male   ☐ Female

2. Age _____

3. What is your responsibility (role) in the company?

☐ Project Manager   ☐ Financial manager   ☐ Human resource manager

☐ Office engineer   ☐ Site engineer   ☐ Coordinator

☐ If other (please specify) _____

4. What is your academic qualification?

☐ PhD   ☐ Master   ☐ Degree   ☐ Diploma/TVET

☐ Certificate   ☐ Specify department or stream _____

6. Work experience:

☐ 0-3   ☐ 3-6   ☐ 7-10   ☐ >10

PART II. Attributes on expansion project performance

Directions: please think about effects of project implementation on telecom expansion project. Then show the each statement, you are kindly requested to rate your opinion based on the following items mark "x" listing rank (Lowest =1, Low =2, Medium = 3, high =4, and Highest =5).

No	Attributes	Ranking				
		1	2	3	4	5
Organizational culture survey						
1	Employees satisfaction in the company					
2	Clear path for career advancement					
3	Company concern for quality work					
4	Controlling corruption in work area					
5	Rewards and recognition program genuinely					
6	Compensation matches with responsibilities					
7	Appropriate recruitment on position staffing					
8	Committed management in monitoring and evaluation of project					
9	Concerning cultural difference impact					
10	Company encourage creativity, innovation, and continuous improvement					
Sites geographical location and situation						
1	Suit weather for activities					
2	Safe road access to sites					
3	Site security and society collaboration					
4	Proper site survey before implementation					
5	Legal administrative cooperativeness					

	Managerial capability survey					
1	Interpersonal communication relationship					
2	Planning and organizing tasks effectively					
3	Directing and coordinating employees					
4	Managers knowledge about technical Job					
5	Quick response to problem solving					
6	Decisions and follow-up for outcomes					
7	Stability of organizational decisions and actions					
	Technical capability survey					
1	Technical worker self-motivation					
2	Skill trainings increase staff performance					
3	Communication skills and reporting					
4	Multitasking and task priorities on schedule					
5	Technological skills related to work					
6	Background academic knowledge for position					
7	Completing task properly and at a time					
	Expansion project Performance survey					
1	Accomplish project at schedule					
2	Implement in quality of standard					
3	Finalized project as planned budget					
4	Satisfied Ethiotelecom in project delivery					
5	Develop better competitive advantage					