Addis Ababa University
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Exploring factors affecting system development outsourcing at Ethio telecom

By

Meseret Seyoum

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ADDIS ABABA UNIVERSITY

SCHOOL OF

INFORMATION SCIENCE

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Declaration

I declare that this research report is my original work prepared under the guidance of my supervisor Dr.Dereje Teferi and it has not been presented for any award to any College or University.

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Date _____

This research report is presented for examination with my confirmation as a supervisor.

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Date _____

Acknowledgment

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List of acronyms

BSS - Business Support System

OSS - Operation Support System

CRM - Customer Relation Management

IPCC – IP contact center

TT – Trouble ticket

FRS- Function Requirement Specification

PAT- Pre acceptance test

Email- electronic mail

IS - Information System

ISD- Information System Division

CSD – Customer service division

IT - Information Technology

PC - Personal Computer

R&D - Research and Development

SLA Service Level Agreement

SSD -Strategic system development

ZTE Zhong Xing Telecommunication Equipment

Abstract

Organizations view outsourcing as a way to achieve strategic goals, reduce costs and improve service. However outsourcing have its own draw back it requires effective management to mitigate the situation. The main objective of this study is to explore those factors which affect system development outsourcing process in case of Ethio telecom.

This study employed qualitative approach. Data was collected from Ethio telecom's staffs and outsourcing partners. Semi-structured interviews are used as major data collection method. This study explored the perspectives of the internal IS & CSD staff on their experience of various information system development outsourcing projects. Written and electronic documentations as well as participant observations also served as important triangulation and complementary sources in understanding the phenomenon being studied.

The empirical evidence confirmed that there are thirteen major set of factors and thirty one sub factors which requires special attention on system development outsourcing process. Based on the finding conceptual framework was proposed which can be used as guide line to understand key factors on system development outsourcing at Ethio telecom. Furthermore the findings also revealed that currently Ethio telecom plan to install the required infrastructure installation separately and only the software system products are open for purchase. This helps the company to save installation cost, implementation time, increase scalability and manageability.

Keywords: - System development, Outsourcing, Factors.

CHAPTER ONE: Introduction

1.1 Background of the study

Information systems outsourcing is contracting out part or all of an organization's these includes data processing, hardware, software, communication network, and systems personnel to an external party (Palvia & Prashant , 1995). The high demand on software applications and services is forcing more companies to turn to outsourcing to meet their customer needs (Rasha , Philip , Ed , & Fergus, 1997).

Software development outsourcing is a multifaceted and complex activity in which clients and vendors interact in many different ways to produce and deliver the required software services (Anandasivam & Sanjay, 2010). Information technology support is required to provide better telecom service. Outsourcing software development is a growing area it increases the software success ratio because of deployment of highly expert team on the project (Haider, 2016)

Outsourcing software development has proven to be to be a means for many companies success worldwide. In recent years contracting-out has emerged as a key policy option in some developing countries to reform and improve their customer services (Afande & Maina, 2015). For an environment which depends on cost-cutting and downsizing information systems becomes a probable target for outsourcing due to the difficulty of measuring the direct organizational contribution of the IS function if performed in-house (Hanlie , Alta , Paula , & Marianne , 2010).

This study focus on system development outsourcing process at Ethio telecom from technical and strategic perspectives. Several systems found in Ethio telecom are developed through outsourcing. Currently Ethio telecom contract out with three vendors namely Huawei, ZTE, and Ericson Company. For this study three systems are taken as sample to asses outsourcing system development process because they have many users as compared to the others systems found in the company. This are IP contact center (IPCC) and customer relation management from business support system BSS project which is handled by Huawei team and trouble ticket system from operation support system OSS project which is handled by ZTE. IPCC is a platform with personalized processing capability. It integrates the access processing technologies of media such as the Internet, VoIP, E-mail, fax and video. CRM is a system for managing a company’s interactions with current and future customers. It often involves using technology to organize, automate and synchronize sales, marketing, customer service, and technical support.TT system

records the requirements of a customer when the customer contacts a customer service center (TTT training document, 2014).

Currently Ethio telecom contract out system development process to venders to facilitate its business process. However, lots of issues are raised from users of the system and IT professionals regarding on the performance of those system. So the reason for performing this study is to identify issues behind this problem.

The objective of the study is to assess all possible factors which affect the effectiveness of system development outsourcing and its influence on IT professionals from technical and strategic perspective at Ethio telecom. The study was conducted in Addis Ababa. To answer the research qualitative approach is used. The target population is employee of the company located in customer service division and Information system division beside this the vender's idea is included.

1.2 Back ground of the organization

According to the company profile the introduction of telecommunications services in Ethiopia dates back to 1894, when Minilik II, the King of Ethiopia, introduced telephone technology to the country around 1894, with the installation of 477 km long telephone and telegram lines from Harar to Addis Ababa. Gradually, the technological scheme was proved to contribute to the integration of the Ethiopian society when the extensive open wire line system was laid out linking the Ethiopian capital city with all the important administrative towns of the country. The company was placed under government control at the beginning of the twentieth century, and was later brought to operate under the auspices of the ministry of post and communications. In 1952, telecommunications services is separated from the postal administration, and structured under the Ministry of Transport and Communications. The Ethiopian Telecommunications Corporation (ETC), is the oldest public telecommunications operator in Africa. ETC is an integrated telecommunications services provider in Ethiopia, providing internet and telephone services (company's profile booklet, 2013).

In 2010 Ethiopian government has decided to transform the telecommunication infrastructure and services to world class standard, considering the company as a key leverage in the development of Ethiopia. Thus, Ethio Telecom was born on November 29th 2010 with the ambition of supporting the steady growth of the country. Ethio telecom is owned by the Ethiopian government and maintains a monopoly over all telecommunication services in Ethiopia. Ethio telecom was managed on a management contract arrangement from 2010 to 2013 June, by France Telecom.

The vision of the company is to be a world-class provider of telecom services and its mission is to provide world-class, modern and high quality telecom services for all citizens equitably so as to transform the multifaceted development of the country to the highest level.

Ethio tlecom introduce different type of technology throughout those years like fixed line telephone, mobile telephone and different types of internet services including 4G technology it is a new wireless internet access technology that transforms the existing internet speed to a superfast connection capability (TTT training document, 2014).

The demand for mobile services and Internet access continues to grow exponentially .Ethio telecom invest in the communications infrastructure to meet this growing demand. To improve the service given in the company Ethio telecom use outsourcing as strategy. Currently Ethio telecom contract out system development process with two Chinese companies Huawei Technologies and Zhongxing Telecom Corporation (ZTE).

1.3 Statement of the problem

Half of the outsourcing initiatives fails or do not achieve the required objectives because of failure to navigate difficult organizational, cultural factors, middle management resistance, failure to provide clear statements on requirements and procedures (Rasha , Philip , Ed , & Fergus, 1997) (Nakatsu, 2009).

The success of Africa's software export industry depends on joint efforts from members of the governments, academia and industry. The three groups should collaborate to build an environment that supports the software industry in a manner that fosters economic development (Riungu , 2007).

Several systems found in Ethio telecom are developed through outsourcing. Previously the company customer service works are performed manually. The company takes different options to automate the working process this includes outsourcing system development projects .However several issues are raised regarding on system performance.

Some of the issues raised on system performance includes the following point; during system failure maintenance is not an easy task for IT professionals who are the first incident handler for system user's request they provide the support with try and error. Although identifying the root cause for the failures is difficult for them. Most of the issues related to system failure are escalated to vendors but vendors takes several days, weeks sometimes month to provide solution. Clear contractual agreement is very important to facilitate business process and legal issue (Jahyun ,

Kichan , & Rajiv , 2009).Beside this similar problems are raised repeatedly there is stability problem. All those problems influence proper service delivery.

The purpose of this study is to assess which factors affect system development process in the context of outsourcing including after launch services from system development phase context and other risk factors. This study sets out to answer the following research question.

1. What are the factors that affects the effectiveness of system development outsourcing process at Ethio telecom?

1.4 Objective

1.4.1 General Objective

The main purpose of this research is to explore the potential factors that affect system development outsourcing at Ethio telecom. And provide recommendation based on the finding.

1.4.2 Specific objective

- To examine possible factors which affect the effectiveness of system development process in the context of outsourcing
- To identify factors affecting systems development phases related to outsourcing
- To identify risk factors that affect outsourcing.
- To propose model based on the research analysis and findings on system development phase and outsourcing risk factors.

1.5 Scope

This study is conducted in Addis Ababa at Ethio telecom IS and customer service division. The focus of the study is on those systems which are developed through outsourcing for customer service division use which includes (IPCC, CRM&TT). The assessment of system development outsourcing performed from system development phase and other risk factors in the context of outsourcing.

1.6 Significance of the study

The study identify the factors that affects outsourcing system development process on the company and provide clear recommendation. Therefore, this study can be used as good input for the company to identify what aspects are to keep as good practice and manage challenges that needs to be mitigated. Also it helps the company to properly facilitate outsourcing system development process and to get the expected benefit from outsourcing system development. In general, the study helps other companies in Ethiopia as input to realize what to consider during system development outsourcing.

1.7 Organization of the Thesis

The thesis contains five chapters .Chapter one aims to familiarize the reader to the rest of the thesis. The chapter includes a brief description of the research question and research problem and objective of the study. It also justifies the significance of the research.

The objective of chapter two is to build a theoretical foundation for the research through a review of the existing relevant literature. It gathers the existing studies on system development, information system outsourcing, motivational Factors of System development, Risk Factors of System development outsourcing and System development outsourcing from the perspective of system development phase. Finally the chapter shows related work and the identified gaps in existing research.

Chapter three presents the methodology used in this research. It describes the research approach and methods used to conduct the empirical investigation, with a detailed explanation of the basis behind the choice of particular research methods. The chapter also explains the data analysis techniques used in this study.

Chapter four reports the key finding of the empirical investigation of the case study and present the result of case study analysis found from interview. This chapter also offers an in-depth interpretation and discussion of the main findings of the research. Based on the interpretation, a revised framework that shows factors which affect system development outsourcing is offered.

The final chapter, chapter five, presents an overall summary of the thesis. Moreover, it highlights the contributions of the research. The chapter ends by acknowledging the research limitations and identifying areas for further study.

CHAPTER TWO: Literature review

2. Overview

The purpose of this chapter is to review the related literature in System development outsourcing, and factors that affect System development process. The literature review presented in this chapter is divided into three portions. First, the chapter provides overall background about outsourcing situation and addresses its main motivations. Then, the chapter gives a review of research relating to information system development from system development phase and other outsourcing system development. The chapter ends by identifying the gap in the literature.

2.1 System development outsourcing

Outsourcing involves the acquisition of an item which the firm is not capable of producing internally to a satisfactory level (Avison, 2008).Information systems (IS) outsourcing occurs when physical or human resources related to one organization's information technologies are carried out by an external specialized provider outside the organization (Claver, Enrique, & et al, 2002). Information system outsourcing has become so popular in the field of Information technology. Many companies have started to outsource most of their functions like Human Resource, Accounting, Business-Processes, IT Applications, Customer Services and the like (Avison, 2008).

In recent years there has been a substantial interest in information systems development outsourcing. According to recently published reports on IT outsourcing trends information system development outsourcing continues to remain the most popular type of outsourcing (IT Outsourcing Statistics , 2012/2013).Similarly in recent years a continuous growth in information system development outsourcing as a feasible method for system development have been witnessed (Nuwangi, Darshana , & Srivastava , 2013).

Offshore IT outsourcing is the transference of an information technology function from a company to a supplier organization located outside the borders of Client Company. Companies typically invest in offshore outsourcing with the expectation of lower costs, access to specialized resources, and new business ventures (Jennex & Olayele, 2002).Organizations in the developed countries outsource their software development activities to other organizations based in low wage countries (offshore vendors), who provide agreed services with significant cost-saving (Khan, Siffat, Mahmood, & Rashid, 2012) (Jennex & Olayele, 2002).

The forms of outsourcing can be distinguished based on the location of the IT outsourcing provider, the style of cooperation between the business and the vendor, as well as approach to the entire process of project delivery. This includes Near-shoring, offshore IT outsourcing, on-shoring and multi sourcing (Ilan , Julia , & Willcocks, 2009).

2.2 Motivational Factors of System development outsourcing

In today's rapidly changing environment it is difficult for a company to meet the industry standards in providing better quality services, especially in the case of system development, it goes for offshore service provider for a part of its work and then it can concentrate more on its activities in a much better way.

There are many reasons for System development outsourcing .Client organizations benefit from offshore outsourcing because vendors in developing countries (offshore vendors) usually cost one-third less than onshore vendors and even less when compared with in-house operations (Khan, Siffat, Mahmood, & Rashid, 2012). Moreover, offshore vendors improve their skills and service quality with the experience of offshore outsourcing projects, learning new ways to satisfy the clients' needs.

To remain competitive and relevant, many organizations will need to respond even more quickly, accurately, and thoroughly to future market changes, client requirements, competitive challenges, global options, new opportunities and technological advances (Khan, Siffat, Mahmood, & Rashid, 2012).

Figure 1 Reason for outsourcing

Outsourcing offers many advantages. Outsourcing allows companies to find and hire the best experts for specialized work. Outsourcing can also help a business focus on its core components without distractions from additional and support functions (Khan, Siffat, Mahmood, & Rashid, 2012). It is sometimes quicker and more efficient to hire a specialist to do something than it is to bring a company up to speed. Many large companies use outsourcing to fill roles in their organization that would be too expensive or inefficient to create themselves. Smaller companies also turn to outsourcing, though the cost savings is sometimes reduced (Khan, Siffat, Mahmood, & Rashid, 2012).

2.3 Risk Factors of System development outsourcing

IT projects are generally susceptible to various types of risks including financial, legal, and managerial control issues these risk factors can be more significant when it comes to outsourcing IT activities. The benefits of offshore outsourcing can easily affected by various risk factors if

they are not properly addressed (Tafti & Mohammed , 2005). Figure 2 shows a framework for assessing the risks associated with offshore IT outsourcing.

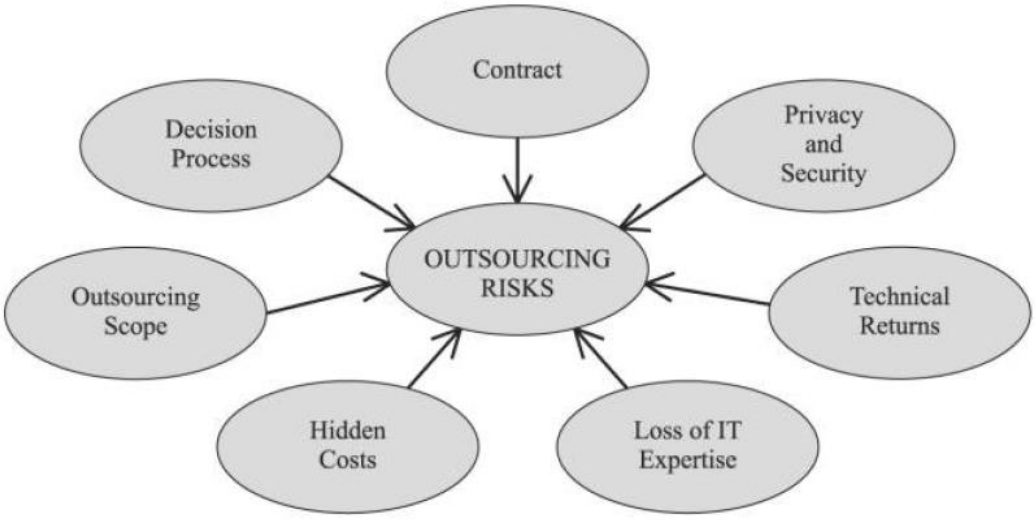

Figure 2 framework for IT outsourcing risk assessment

Source: (Tafti & Mohammed , 2005)

2.3.1 Cost

The cost perspective could be said to include two motivational factors, cost savings and to get more predictable IS costs (Linda & Björn, 2007).

The first group of undesirable consequences pertain to hidden costs, which are sometimes said to be the biggest IT outsourcing problem (Lacity, Mary , Leslie , & David , 1995).by recognizing the importance of cost reduction in a company's outsourcing strategy, vendors highlight their bids by stressing how much money they can save for the customer. However, firms that accept such offers at face value fail to properly assess the hidden costs that are often buried in an outsourcing arrangement (Linda & Björn, 2007).

2.3.2 The contract

One of the most important components of any outsourcing deal is the contract. It describes the services that a vendor is to provide, discusses financial and legal issues.it is the blueprint for the life of the agreement. Extensive efforts must be taken to ensure that every detail of the outsourcing arrangement is spelled out in the contract (Tafti & Mohammed , 2005).

One of the component of the contract is Service Level Agreements (SLA).SLA are formal negotiated agreements that help to identify expectations, clarify responsibilities and facilitate communication between a service provider and its customer (Köppel, Andreas, Dirk , & Sebastian , 1999) . SLA's prevent service degradation by obligating the vendor to perform at a specified level while still meeting the firm's lower cost expectations (Tafti & Mohammed , 2005). Service level agreements (SLAs) are clauses in a contract that ensure the firm is getting the level of performance that it is expected from the vendor. SLA's prevent service degradation by obligating the vendor to perform at a specified level while still meeting the firm's lower cost expectations (Sommer & Rainer , 2003).

No matter how specific the SLA, there will inevitably be times when the client and the vendor disagree on whether something constitutes a missed measure. For this reason, it is important to make provisions in the contract for problem resolution procedures (Baccarini, David, Geoff , & Peter ED , 2004) .

An outsourcing agreement can be risky if the terms of the contract do not provide flexibility and room for growth. As businesses expand and regress, technical demands are likely to change. New technologies may become available, but an organization may find itself unable to take advantage of them because its outsourcing contract does not permit such accessibility (Tafti & Mohammed , 2005).

2.3.3 Loss of IT expertise

When organizations outsource their IT functions employee surplus is created on IT department. However, the ultimate risk of losing a significant portion of corporate IT talent and future ability to learn can be devastating (Tafti & Mohammed , 2005).

Companies which are relied on IT vendors may find it difficult to develop and learn technology since every innovation requires a sufficient availability of technical and economic resources, something that is not precisely favored by outsourcing (Bresnahan, Timothy , Erik , & Lori, 2002).

The risks of losing IT knowledge extend beyond inhibiting Client Company's ability to efficiently provide services. Even during contract negotiations with an IT vendor, a lack of adequate IT expertise can greatly shift the advantage to the vendor. Without individuals that understand the company business and process, the skills to identify its technical needs, the company may be

unable to precisely define its requirements and negotiate sound contracts (Gopal & Anandasivam, 2003).

2.3.4 Privacy and security

The risks of privacy and security is very high regarding to IT outsourcing .So risk analysis and determining appropriate counter measures is necessary for all companies (Ramer & Rob, 2001). Organizations engaged in offshore IT outsourcing are responsible to adopt and implement a policy for protecting the privacy of individually identifiable information. (Tafti & Mohammed , 2005).

Companies engaged in IT outsourcing must have a comprehensive and explicitly-documented corporate policy on protecting individual privacy and data security to reduce possible risks of privacy and security breach (Tafti & Mohammed , 2005) .

2.3.5 Outsourcing decision process

Outsourcing decision depends upon the preferences of the company, whether the company requires this activity in future or not or if company has specific benefits of keeping it in hand. The decision of outsourcing undertakes every single aspect involved in detail and the final decision is taken by considering the feasibility of the project from future point of view (Khan, 2008).

It is important to include all relevant levels of management when considering the outsourcing option. Because of the size and impact of most outsourcing deals, company's senior executives typically assume full responsibility for the outsourcing agreement from start to finish. Key IT managers (CIO, VP of Information Systems, etc.) who will be affected by these decisions may be left out of the process. Research suggests that this course of action decreases outsourcing's success rate (Tafti & Mohammed , 2005), (Lacity, Mary , Leslie , & P, 1998).

There are also risks posed by not carefully considering the advantages of organizations in IT department resources and capabilities. Research has shown that outsourcing deals are most successful when organizations thoroughly consider both internal and external bids (Lacity, Mary , Leslie , & P, 1998).

2.4 Factors affecting the management of information system development outsourcing; from the perspective of system development life cycle.

Software life cycle models describe phases of the software cycle and the order in which those phases are executed (Ragunath, Velmourougan, Davachelvan, Kayalvizhi, & Ravimohan, 2010).

Several methods have been developed with the aim to be able to deliver software faster and to ensure that the software meets customer changing needs. All these approaches share some common principles: Improved customer satisfaction, adopting to changing requirements, frequently delivering working software, and close collaboration of business people and developers.

There are lots of software development models and many companies adopt their own, but all have very similar patterns. The phases that are generally present in each and every software development life cycle model are (Mishra, Apoorva, & Deepty , 2013);

1. Understanding the problem (through requirements gathering).
2. Deciding a plan for a solution (Designing)
3. Coding the planned solution
4. Testing the actual program
5. Deployment & maintenance of the product.

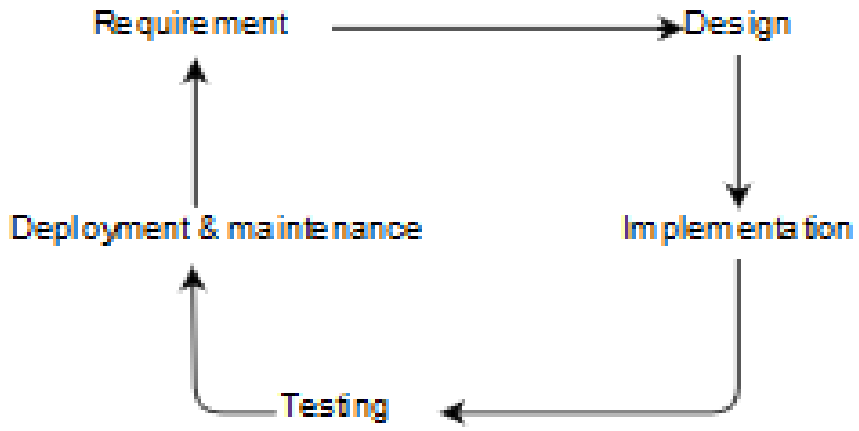

Figure 3 General system development life cycle model

Source - (Mishra, Apoorva, & Deepty , 2013) , (Ragunath, Velmourougan, Davachelvan, Kayalvizhi, & Ravimohan, 2010).

There are numerous models of the system development life cycle exists the well-known are water fall model, incremental and spiral model.

Commonly Ethio telecom follow waterfall or traditional development method, but sometimes when the project cannot complete based on the time frame, the development method is changed somehow it looks incremental. When functional requirement and system design completed in sequential manner coding, testing and implementation or launch is done on phased approach in which the most critical modules are implemented first and the other module will continue. Ethio

telecom do not follow well known standard of software development method since the development process is not fully waterfall or incremental.

2.4.1 Requirements Management in Outsourcing Projects

Requirements are the basis of any project, whether it is in the form of specifications, use cases, the requirements define the problem to be solved and the solution to be provided (Frauke, Dr.Armin , & Dr.Frank, 2003). If the initial problem isn't analyzed carefully it will create unambiguity and it will lead that the delivered solution doesn't actually perform the required task (Hanlie , Alta , Paula , & Marianne , 2010).

The first phase of requirements analysis that of the user requirements is almost performed in-house. This phase defines the goals that the system must achieve. The second phase of requirements analysis that of system requirements or system specification involves analysis of the user requirements and proposal of a solution (Frauke, Dr.Armin , & Dr.Frank, 2003). .
Misunderstandings due to the outsourcing partner's lack of experience in the problem domain are common at this stage .The requirements for an outsourced project should also include any implicit requirements, such as conformance to company standard and user interface standards. Such standards may be informal when development is performed by a single team; they must be made explicit for an external partner (Sujani & Nalli, 2006).

The final system requirements should be reviewed by as many people as possible in required team like marketing, engineering and test departments. Reviewers should check that the requirements are clear, testable and feasible; that they satisfy the user requirements; and that they're coherent when taken as a whole (Sujani & Nalli, 2006).

2.4.2 Design and Development

In design phase the system overall structure are defined. In terms of the client/server technology, the number of tiers needed for the package architecture, the database design, the data structure design and the like. Systems analysis describes what a system must do to solve the business problem, and systems design describes how the system will accomplish this task. The deliverable of the systems design phase is the technical design that System outputs, inputs, and user interfaces, Hardware, software, databases, telecommunications, personnel, and procedures , How these components are integrated This output is the set of system specifications (Sujani & Nalli, 2006)

2.4.3 Testing and Integration

Software testing has been defined as the process of executing a software system to determine the compliance with specification. Testing has been identified as the basic form of defect identification for majority of software projects. The testing process focuses on the logical internals of the software, assuring that all statements have been tested (Roger & Pressman, 2001). After testing the product is integrated into its operating environment. This phase ends when the user or clients signs off on the user acceptance results (Sujani & Nalli, 2006).

2.4.4 Deployment and Maintenance

Deployment is the installation of the software product into the production environment. The project is officially over at this phase. Software will undergo changes after it is delivered to the customer. So the software support and maintenance re-applies each of the preceding phases to an existing program rather than a new one. The cutover phase resembles the final tasks in the SDLC implementation phase, including data conversion, testing, changeover to the new system, and user training (Sujani & Nalli, 2006).

2.3 Related work

Jennex ,Murray & Olayele studies success factors for offshore information system development. The objective of the studies is to identify a small set of key factors that small to medium sized enterprises should concentrate on. The survey found that the critical success factors are workers 'skills, client knowledge, and trust in the client-outsourcer relationship, telecommunications, and intellectual property protection are the most critical to the success of offshore software development outsourcers (Jennex, Murray , & Olayele , 2003).

Leah Riungu studies the state of offshore software development in Africa. The success of Africa's software export industry depends on joint efforts from members of the governments, academia and industry. The three groups should collaborate to build an environment that supports the software industry in a manner that fosters economic development (Riungu , 2007).

Gerald and George studies risk effect on offshore systems development project cost they classifies the risks category into three this are security risks, legal risks, and general risks. The study identifies that the challenge facing many organizations is lack of awareness of, or a deliberate decision to ignore these additional risks when considering offshore systems development. The increased risks of offshoring do have significant associated costs that need to be considered and included in the final cost calculation (Gerald & George , 2010).

Robbie, Charalambos and Iacovou work on comparative study of important risk factors involved in offshore and domestic outsourcing of software development projects. The study objective is to create empirically generated lists of risk factors for both domestically and offshore outsourced projects and to compare these two contexts. To address these objectives they conduct Delphi surveys. The study findings suggested that traditional project management risks were important in both offshore and domestic outsourcing. However, the offshore context seemed to be more vulnerable to some traditional risks as well as factors that were unique to it (Nakatsu, Robbie, Charalambos, & Iacovou, 2009).

Table 1 Selected studies on information system outsourcing.

Researchers	**Setting**	**Context**	**Research Techniques Used (Questionnaire/Interviews/ Observation)**	**Objective of the research**	**Result**
Hugo Rehesaar and Andrew Rose(2000)	Australia	Project management	Questionnaire	➢ To investigate the effect of in-house versus outsourced development on project manager's Critical success factors. ➢ To investigate the effect of client's acceptance criteria on project manager's critical success factors.	➢ four factors specified by outsourced project managers are shared by in-house project managers, 1)Requirements/specifications 2)Involvement of key personnel 3)Monitoring and feedback 4) System testing ➢ 18 critical success factors were identified for the 8 discrete client acceptance criteria
Robbie, Nakatsu , Charalambos & Iacovou(2009)	United States	Comparison on Offshoring and domestic outsourcing	Delphi surveys	To identify factors involved in offshore and domestic outsourcing of software development projects	study suggested that traditional project management risks were important in both domestic and offshoring software development outsourcing context; however, the offshore context seemed to be more vulnerable to some traditional risks as well as factors that were unique to it

2007 Leah Riungu	Africa	offshore software development in Africa	questionnaires and voice interviews	The aim of the study is obtaining an initial general overview of offshore software development in Africa.	The success of Africa's software export industry depends on joint efforts from members of the governments, academia and industry.
Jun, Liu, Wang Qiuzhen, and Ma Qingguo (2011)	China	project risk management(vendor perspective)	survey based research design	This paper develops an integrative model to explore the moderating effects of uncertainty on the relationship between risk management and IS development project performance from a vendor perspective	The results reveal that project uncertainty can moderate the effects of Project planning and control on process performance and the effects of user participation on product performance.
2009 Muluneh	Ethiopia	Outsourcing management	Qualitative research	aims to empirically assess how IS/IT outsourcing is managed	The outsourcing organization has failed to meet its schedule, cost, requirements, and customer service objectives. The major causes for these problems were lack of detailed requirements from the beginning, lack of detail in the SLAs, lack of previous experience in software outsourcing management.
Iyasu in 2017	Ethiopia	Benefit and challenge of IS development	Qualitative research	The aim of the study identify the key driving forces for the national bank of Ethiopia to outsource it IS development , examine benefits and core challenges of the bank faced while outsourcing	The bank outsourced its information system because of political or external forces, standardization by which National Bank should have in relation to system to lead financial sectors. The bank benefited from some of the application outsourced but in reverse the bank has faced challenges and it has no outsourcing strategies to solve or minimize the challenges.

2.4 Gaps in literature

From the above exhaustive literature review on system development outsourcing the researcher identified below valuable gaps:

The first gap in the literature there are multiples of researches which has investigate IS outsourcing in different context as briefly shown in related work part. However, there is limited studies which asses' factors that affect outsourcing in the perspective of system development phase in more complete way .Few exception (Hanlie , Alta , Paula , & Marianne , 2010) which only investigates essential aspects of IS outsourcing management during the software development life cycle.

The second gap is there are few researches which emphasize both venders' and client ideas related on outsourced system development projects .Few exceptions (Sabherwal, 2003) which examines only the coordination of outsourced information system between client and venders.

Furthermore, there are few studies which use multiple methodology to investigate the situation. It is recommended that using multiple methodology make the research credible and reliable (Zohrabi & Mohammad, 2013). Therefore this study uses multiple methodologies to make the work more reliable.

Thus, this study is a response to the above deficiencies. The study, therefore, represents an attempt to provide a general survey and exploration of key factors on system development outsourcing system development perspective and other risk factors in outsourcing context in the cease of Ethio telecom.

2.5 Chapter Summary

The purpose of this chapter was to establish a theoretical basis for the empirical research done and it is a review of existing related literature. The first part discussed about the development of the IS outsourcing practice, addressed the central motivations for IS development outsourcing. The second part dealt with definitions of system development outsourcing, risk factors on system development outsourcing, outsourcing form system development phase and outsourcing from strategic perspective are dealt. While performing this, the gaps in the literature are identified. It was revealed that there is a lack of complete examination and analysis of the factors that affect the success system development outsourcing in the company context.

CHAPTER THREE: Methodology

3. Overview

The previous chapter provided a background information for the survey by reviewing relevant literatures. The objective of this chapter is to provide an overview of the research approaches used within the information systems discipline for answering the research questions. In the following section research approach, data collection methods and data analysis techniques are described and justified. Furthermore, arguments for the validity and reliability of the work is given.

3.1 Research approach

This study requires detail investigation to identify those factors that affect system development outsourcing. To explore the situation qualitative approach is adopted and the reason is discussed and explained below:

Qualitative research approach produces the detailed description of participants' feelings, opinions, and experiences and interprets the meanings of their actions. Qualitative research results provide the relationship of information processing with performance specifically and deeply (Rahman & Md , 2016).

Qualitative research methods can be used to better understand any phenomenon about which little is yet known, as well as to acquire new perceptions on issues about which much is already known, or in order to acquire more in-depth information that may be problematic to deliver quantitatively (Corbin & Strauss, 2008)

The basic premise of this research is exploring key factors of system development outsourcing at Ethio telecom. So qualitative research method is more suitable.

There are many qualitative research strategies that could be employed in IS research. The selection of a specific strategy primarily relies on the aim and the objectives of the study (Creswell, 2013).This study follows in-depth case study. Case study is well suited with information system empirical research (pare, 2004).

The main reasons that this study selects the case study as a strategy is described below:

This study is exploratory in nature and exploratory case study strategy is believed to be suitable in order to find out what is happening and to look for new perceptions. Case study research, through reports of past studies, allows the exploration and understanding of complex issues. It can be considered a robust research method particularly when a holistic, in-depth investigation is required

(Zainal & Zaidah, 2007). Case study strategy is suitable when studying exploratory research on multifaceted social phenomena in real-life settings (Eisenhardt, 1989).

3.2 Research design

Research design is blue blueprint for empirical research aimed at answering specific research questions it specifies the data collection process, the instrument development process and the sampling process (Bhattacherjee, 2012). The plan and the structure of the examination that the researcher undertake, to collect and analyze the research data is described below.

3.2.1 Data collection methods

In this study, multiple data collection methods are used. Semi-structured interview is used as main source of data collection with observation and documentation, which helps as additional sources for understanding the phenomenon. It is believed that using different types of procedures for collecting data and application of different sources can supplement the validity, reliability of the data and their interpretation (Zohrabi & Mohammad, 2013).

3.2.2 Semi-structured interview

The semi-structured interview guide provides a clear set of instructions for interviewers and can provide reliable, comparable qualitative data (Cohen, Deborah, & Benjamin , 2016). Semi-structured interview questions provide the opportunity for identifying new ways of seeing and understanding the topic at hand (Cohen, Deborah, & Benjamin , 2016). In this study, semi-structured interview is adopted for data collection.

Semi-structured interviews are conducted on selected representatives from two division of the company information system and customer service division which have high role on IPCC, CRM, TT systems at Ethio telecom. Semi structured interview creates the chance to gather “rich data from people in various roles and situations” (Myers & Michael, Qualitative Research in Business and Management ., 2009) .

To select participants for the interview purposive sampling technique is used. Purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within. Choosing the purposive sample is fundamental to the quality of data gathered thus, reliability and competence of the informant must be ensured (Dolores & Tongco, 2007). In this case the samples are selected based on expert’s involvement in the project of CRM, IPCC and TT systems.

For this study the purposive samples consists of IS specialist, IT solution engineers, technical support supervisors, project managers from client side and System engineers from vender side. Because they have direct involvement in Ethio telecom IS development outsourcing projects specifically (IPCC, CRM and TT). That enable them to have a detailed understanding of the phenomena understudy. Purposive sampling allows the researcher to choose subject which their opinion is relevant for the study.

For this study interview questions are adapted from two literatures (Le & Phuong, 2016) (Yalaho, Anicet, & Nazmun , 2009). The interview question contains 26 questions for project manager and company experts and 8 questions are constructed for venders. The questions are aligned with system development phase and overall outsourcing project issues which are relevant for system development.

Interviews are first conducted with IS staff at Ethio telecom which are directly involved in the IS outsourcing projects specifically on IPCC, CRM and TT. Those factors which affect system development process of the specified system are investigated based on the participants' experiences and viewpoints. Then, interview is conducted with venders who participate on development of those project. Finally, the researcher attempts to understand the views of the executives of IS project managers on future strategies and decisions about information system development outsourcing. Interviews are conducted in the interviewee's office, which facilitated the consultation of relevant documents if the interviewee needed to check details or share related materials. Prior to the interviews, participants are notified of the objectives of the study. All interviews were conducted in Amharic and transcribed into English. The interviews varied in length from 40 minutes to 1 hour. During the interview, notes are taken so that a complete and accurate record of the conversation can be obtained.

Respondents Category	**Title**	**Number of Respondents**
Client	Project manager	**1**
	IS Specialist	3
	IT Solution Engineer Specialist	2
	IT application support supervisor	2
	IT application coordinators	1
Vender	Software engineers	2

Table 2 Respondent category for interview

3.2.3 Observation

Observation methods are useful to researchers it provide researchers ways to check for nonverbal expression of feelings, determine who interacts with whom, grasp how participants communicate with each other, and check for how much time is spent on various activities (Barbara & Kawulich, 2005).Detailed notes are taken in which the participants communication, tool usage, and use of documents and other work artifacts are all noted. The collected data through observation is used as additional to complement data obtained through semi-structured interviews.

3.2.4 Document Analysis

Document analysis is an efficient and effective way of gathering data because documents are manageable and practical resources (Bowen & Glenn , 2009).In this study, different kinds of recorded data are collected to explore factors of system development outsourcing at Ethio telecom. Available, documents of system development outsourcing contracts, reports, email conversations and training documents are all collected. The documents are generally used to verify the participants' factual statements obtained in semi-structured interviews. The document analysis enabled the researcher to double-check regarding to the raised issues.

3.2.5 Data Analysis

For this study content analysis technique is adopted to analysis qualitative data. Content analysis is the procedure for the categorization of verbal or behavioral data for classification, summarization and tabulation purpose. Content analysis can be done on two levels:" Descriptive: What are the data? Interpretative: what was meant by the data?" (Dr Christopher & E .Sunday).

Content analysis is used for this study to enable the explanation of all interviews, documents and notes of observation and relating each one to the whole to gain a holistic picture of the phenomenon.

3.3 Reliability and Validity

Standards for judging the quality of research is in terms of validity and reliability (Myers, 2013).In this work, some strategies are adopted to increase the study's validity and reliability and to decrease possible biases.

To achieve triangulation multiple methods are used this includes semi semi-structured interviews, observation and document analysis. In the semi-structured interviews, data from two division of Ethio telecom is also picked up in order to advance a different course of inquiry and provide

multiple measures of the phenomenon under study. Usage of multiple sources increase the robustness of the results (Eriksson., Paivi, & Anne , 2015) .

The initial drafts of each of the case study reports are emailed and discussed to some participants of Ethio telecom to verify them for accuracy and to review them for comments, amendment, and further feedback and clarification where necessary. The revaluation of the rough drawing of the case study report "produces further evidence, as sources and participants may remember new materials that they had blanked out during the initial data collection point" (Myers & Michael , 2009).

Expression of some research participants is clearly putted in quotations in supporting the arguments in each case report. Some striking raw data collected from the fieldwork need to be included in the research write-ups in order to "allow the reader to get a better picture of the respondents' own concepts and categories, without relying solely on the interpretation of the researcher" (Lee, Nick, & Ian , 2008).

3.4 Chapter Summary

This chapter has shown the methodological approaches used in information system filed. Main focus is placed on selecting research approaches that are efficient at capturing and preserving the depth and richness of the information throughout the inquiry procedure in this study.

An outline of mixed research approach and justification that mixed approach would be more desirable for this study are provided. The qualitative approach facilitated the researcher to associate more closely with the participants, and to identify issues of substance and interpretation that they give to their organizational activity. Data collection methods that were employed included semi-structured interviews, observation and document analysis. To properly get the thoughts, experiences, ideas, opinions and knowledge of the participants. The qualitative content analysis is found to be the appropriate technique for analyzing the data. Finally, the issues related to methodological validity and reliability are described.

CHAPTER FOUR: Analysis, Findings and Discussion

4.1 Overview

Several issues emerged from the analysis of the interview. The aim of this chapter is to present the findings from the analysis of the case study. The researcher attempted to understand this phenomenon in terms of the meanings the participants bring to them based on their actual experiences in various IS outsourcing projects.

4.2 Case Study Analysis

In this section detailed analysis and descriptions of the case on system development outsourcing is discussed. The descriptions are developed mainly from the investigation of the data obtained from semi-structured interviews, documents and observations.

Therefore the cases are analyzed from the point of the research questions view and specific objectives of the study, by giving a brief outline of system development outsourcing as outlined in (Table 4)

System development outsourcing case analysis
factors which affect the effectiveness of system development outsourcing (Research Q1) ➢ System development perspective ✓ Requirement ✓ Test ✓ Deployment • Data migration • Cutover • Integration • Training and maintenance ➢ Risk factors ✓ Contract ✓ Cost ✓ Security ✓ Relationship ✓ Decision process ✓ Loss of IT expertise

Table 3 Case study analysis

4.2.1Observation and document analysis

Date found on observation is related on training and testing process. Beside this several documents, mail conversant related with training modules, documentation and incident support request are referred as described in the below paragraph:

From prior experience and participation on system testing process the following issues are observed. Due to language difference between client and venders the testers face problem to flow the communication as they want. The other issue observed on testing process is that the test is performed in staff's office this things interrupt testers to work with full intention.

From prior experience and participation on training sessions provided for technical supports during system launch it's noted most of the contents have general concept also the training section is not guided with practical sessions.

Based on observation and prior experience during system maintenance request for the support team it is noted that there is no manual that guide them. IT support team perform the support with trials. Also the solution taken for the same incident doesn't work for other days.

Several documentation and training modules related with IPCC, CRM and TT systems are recorded .The training modules shows how to use the system functionalities however the technical guides that help IT professionals and other error codes that help to identify the incidents type related to each systems are not clearly included.

Several mail conversation regarding on system incidents are recorded. Based on recorded mail conversation on incident escalation related on IPCC system and other support request. It's noted that most of the request didn't get solution on required time .Most of the responses are related with service level agreement.

4.2.2 Qualitative analysis

The analysis of the case in a way that covers as much as possible the identities of the individuals.

Category	Position	Psudename	No of participant
Client	Project manager	Client 1	1
	IS specialist	Client 2 Client 3 Client 4	3
	IT Solution Engineer Specialist	Client 5 Client 6	2
	IT application support supervisor	Client 7	2
	IT support coordinators	Client 8	1
Vender	Computer engineers	Vender 1 Vender 2	2
Total			11

Table 4 interviews participants

4.2.2.1 Factors which affect the effectiveness of system development outsourcing

As the respondent's feedback there are several factors which triggers the effectiveness outsourced system development process as presented and discussed below.

4.2.2.1.1 Requirement Factor

The exploration of the interviews shown that there are different issues which affect requirement process which are raised from both client and venders side. These are end-users involvement, users change their requirement, understanding user need, and empowering staffs as shown in (Table 5) and discussed below.

Interview evidence	Themes	Key theme
End user involvement in preparing requirement documentation is very important.	End user involvement	

Users may have only a vague idea of what they need so it's very important to clearly understand there expression.	Understanding users need	Requirement
If the requirements are clear, verifiable, accurate, consistent, complete and feasible then they are realistic to be put in the requirements document and then implemented.	Clear requirement	
User change their requirement after the system development. To deal with this situation backup plan is important.	Users change their requirement	
Empowering staffs who involve in requirement preparation is one issue which need the attention of higher level management. Sometimes there is difficulty to communicate with venders because stakeholders comes from different technical background.	Empowering staffs	

Table 5 Requirement Factor

According to the IT Specialist on OSS project (TT system) client-2: requirement analysis preparation process must be secured beside this as much as possible the requirement document must be clear and to the point to minimize vagueness.

Client 2: describes the requirement process as follows: *"The requirement analysis is done by different teams organized from customer service division which are key users on the required system and selected members of IS team. Then user's requirements are mapped by referring different telecom system standards example ETOM. During the requirement analysis process the experience of French consultant are used as benchmark. The requirement analysis is done in secured way which is not accessible for venders because if they know they will be prepared on it. Once the requirement preparation is settled and open to venders they will come with their module. If there is difference with our requirement they provide other options related with our module beside this they ask clarification for the requirement."*

Project manager (CRM & IPCC) explained that stakeholder involvement for every detail requirement is very important to have better result.

"Requirement is prepared by discussing with stakeholders. Vendors have base line for each system including CRM and IPCC .So the prepared requirement cross checked with venders if it is comply with the requirement, the next step will continue. If there is difference with requirement it is included on scope definition to prevent additional cost."

According to the IT solution Specialist on BSS project (IPCC system) client 5 the challenge on requirement can be seen from two angles, one is that client change their need once system development stared and the other is vendors didn't deliver the required product as intended.

"During requirement preparation the challenge was from both user side and venders .Users change their need after the requirement is settled .The problem with vender side is that they didn't deliver the product based on our requirement sometimes it leads to disagreement. To handle this situation meeting called for negotiation between user and venders then the meeting minutes issue sent for all participant based on this the requirement will be changed."

As IT Specialist on BSS project (CRM system) client 2 explanation the challenge on requirement preparation is decoding old system to the new one.

"*In requirement preparation of CRM system the challenging is understanding user requirement and decoding old system to the new one .The requirement did not include detail for example disposing method is not included .To manage all issue the requirement preparation must be strategic."*

According to Vender 1 CC engineer OSS project (TT), users request new requirement which is not included on the contract.

"Related to requirement the challenge from client side is that most of the time they come up with new requirement or modification request which is not included in the contract. It is difficult to deal with them it leads to disagreement."

4.2.2.1.2 Test Factor

The exploration of the interviews show that there are different factors which affect testing process. This are high fault rate, language barriers, test environment, training experience, missing requirement as shown in Table 6 .

Interview evidence	Themes	Key theme
Vendors code some of the functionality during system testing they didn't provide full functionality. This will increase fault rate.	High fault rate	Test
During testing the main factor that affect the testing process is language barriers.	Language barriers	
The test environment is not comfortable .There were no class reserved for test. Also the testers from venders side changed frequently this create misunderstanding in some test case.	✓ Test environment ✓ Consistency of testers	
Training is needed for testers before they start the real job however in CRM case the tester didn't take any training and some of them also lack prior experience.	✓ Training ✓ Experience	

Table 6 Test factor

According to the IT Specialist on OSS project (TT system)Client-2, Vendors code some of functionality during system testing so this create bias and affect testing process they didn't provide full functionality.

"The test process is done first both functional and nonfunctional test document is prepared from FRS on system base. If the system pass 95% of the test it will be accepted. During test process operation team, end-users and venders participated. Test is done by selecting model of the system. Observed challenge on this project is that some tests are done simply developer code the requested functionality on test time and send for R&D team for update. Due to this some test case are pass easily. "

According to the IT solution Specialist on BSS project (IPCC system) Client 5, the main factor that affect the testing process is language barriers. From prior experience on some test case this issues is clearly observed.

"On testing phase different types of tests are performed .The PAT document are prepared for functional, nonfunctional and performance test. Test process is done with vender tools. Finally pilot test perform before launch of the new system and it is done at night time. The challenge on

testing process is communication. Testers took long time on discussion due to language barriers sometimes the issue is transferred for the next day"

According to the IT Solution Specialist on BSS project (CRM system) Client 6, the test is performed in staff's office and there is no class room reserved for test .Also based on observation on some test process issue related on the test environment is clearly noted. Moreover, the testers from vender's side changed frequently. This creates misunderstanding in some of the test cases.

"*Test performed on two way functional and nonfunctional test. The design team prepare test case based on the requirement then project acceptance team will be created .The test Pass/ fail rate calculation depend on the management agreement .in General three type of test performed project test, user acceptance test and customer journey test .user acceptance test applied to check whether the user requirement is fulfilled as intended .project acceptance test is applied to check whether the project really show the expected result .customer journey test is performed after user acceptance test during launch in order to check that dose the system affects customers. The challenge during system test was the test environment is not suitable for performing the test. The other challenge is that testers from venders side changed frequently this create misunderstanding in some of test case."*

IT Specialist on BSS project (CRM system) client 2 stated that training is needed for testers before they start the real job. However, in CRM case the tester didn't take any training and some of them also lack experience. Based on the researcher experience on some test case this issue is clearly noted.

"*The test document is prepared from FRS then different types of test are applied like performance test, business scenario test, integration testing, and data base testing. To make the testing process effective testers must be skilled on the area. But the challenge on this project is that the testers simply organized from different team with no prior experience and training"*

According to Vender 2 CC engineer BSS project (IPCC/CRM) clients miss the requirement and request new functionality and modification this makes the communication process challenging.

"System test is done with client based on PAT document .The challenge faced during testing is that client's request new functionality which is not included on FRS document. Due to this the test is stopped with disagreement."

4.2.2.1.3 Deployment Factor

The exploration of the interviews has shown that there are different factors which occur during system deployment. These are consistency, getting support, data incompleteness, pilot period, training, documentation as shown in Table 7 and discussed below.

Interview evidence	Themes		Key theme
During deployment those system which pass test environment will not work in real environment. There is consistency problem .The other factor is product delivery time is not as planned.	✓ Consistency ✓ project time line		Deployment
There is difficulty on getting proper support from venders. Data incompleteness from Ethio telecom side was very challenging.	✓ Getting support ✓ Data incompleteness	Data migration	
No pilot period is applied the full products are launched directly. Also training and documentation was not properly provided.	✓ Pilot period ✓ Training ✓ Documentation	Cut over	

Table 7 Deployment factor

According to the IT Specialist on OSS project (TT system*) client 2, during* deployment those system which pass on test environment not work in real environment.

"The challenge during system deployment is system functionalities that pass during testing process does not work on real environment. For example in performance test, a test case which pass the stated performance requirement of software and hardware to serve the number of subscribers and concurrent user's .Shows lesser result on real environment than expected .Sometimes core function which are putted as pillar in the requirement fails the test .To handle such issue there is 'baby care time 'for about six month after deployment to recheck the system with venders. Due to the vast amount of issues raised on system faller baby care time is bypassed currently it took two years. "

According to Vender 1, use of multi-vendor product makes the communication process challenge during system deployment.

"Most of the time the challenge raised during system deployment and integration is when clients use multi-vender product. This make the coordination process challenging "

4.2.2.1.3.1 Migration

According to the IT Solution Specialist on BSS project (CRM system) client 5, the main challenge faced on data migration was difficulty on getting proper support from vender's .Also the data incompleteness from Ethio telecom side effects the data migration process.

"The problem during data migration is that it's difficult to get support from both internal and external venders. Specially getting Corporation from previous vendors was difficult sometimes both venders blame each other. The other is Ethio telecom data (customer data) on the data base was incomplete for example it may miss name of customers, age and it have dummy files .All garbage file migrated from old system to the new one .This create challenge on capacity . License of database is purchased for every user for example, if the company buy 60 million customer license and the old is 20 million the garbage data will take 40 million license .After a year expansion will be required because the license will be taken with garbage data. The other problem is design (data model) difference. During data migration small number of users are participated for this reason it is difficult to get responsible person on some tasks. The other challenge is consistency problem on data connection, due to this the data migration process was interrupted.

According to the Project manager (CRM & IPCC), getting clear data and coordination with end users was difficult.

"*During project migration getting pure data was challenging .Also coordination with users of customer service was difficult they thought everything is responsibility of project team."*

According to Vender 2, during data migration coordination with previous vendors was challenging.

"During data migration the challenge was getting proper feedback from previous vendors this makes the communication challenging"

4.2.2.1.3.2 Cutover

According to the IT Solution Specialist on BSS project (CRM system) no pilot period is applied the full products are launched directly plus training and documentation was not properly provided.

"Before cutover training was not provided properly. Also after cutover there was no support team for some period of time. The other problem is there was no pilot period CRM system is lunched

directly .Due to this user of the system are challenged also customer traffic increased. Related to documentation Huawei is better than previous vendors. Related on system support, most of the support is handled by internal staff. Due to the lag of those payable agreement venders didn't want to share everything .When venders are requested for support they inform users to receive documents from internal engineers .In general support and documentation provided by vendors are not satisfactory users perform many thing with their own effort.

Majority of respondent specify that the content of the documentation not helpful for technical person .Based on the analysis of recorded documents regarding on the documentation and the training module the data shows only how to use the system and all the functionalities and error codes to solve incidents regarding on the system are not clearly included. Here is some of respondent answer**:-**

According to the IT Specialist on OSS project (TT system*) client 2"the documentation is delivered during hand over. Venders are requested for clarification if needed. Vendors report their progress on regular bases if it have SLA .However currently the SLA is under negotiation this makes challenging to get the required support. From past experience previous vendors perform many task for free as compared to current vender.*

According to the IT solution Specialist on BSS project (IPCC system) client 6"*The documentation is not detailed as required for example, they didn't specify the integration or related tables for each database .The training is prepared for ordinary users of the system it is not helpful for technical person."*

According to the IT Specialist on BSS project (IPCC system) *client 1"The documentation is not proper operational document which help technical person to guide end users. The error code are not properly recorded in the document instead they put other company experience which use the same system with Ethio telecom. The document is bulky it is not easily captured. The other challenge is venders develop only the product and they use third party system for example they use oracle data base. Also venders use different operating system like IBM or SUCI so they can't give enough documentation for this because it's proprietary by itself. Currently daily support methods and handling experience are recorded by requesting venders and through daily activities. "*

4.2.2.1.3.3 Integration

The exploration of the interviews shows that there are different factors which occur during system integration this are multi-vender, system delay as shown in Table 8 and discussed below.

Interview evidence	Themes	Key theme
Challenges on integrated system is performance issue, to display the required data it takes several time because to fetch the required data it pass some sort of process. The other challenge on integrated system is if one of the system product fails to work it affect the other one.	➢ Delay on response time ➢ Multi-vender product (prone to failure)	Integration

Table 8 factors on system Integration

As respondents feedback the basic challenge on integrated system is having low performance related to the response time for any request. Also using multi-vender product will make the coordination process with venders make challenging. The other challenge factor is if one system fail to work it affect all systems which are integrated to it. Here is the respondents view:

According to the IT Solution Specialist on BSS project (CRM system) client 6 "*In general, customer relation management system(CRM)is part of business support solution BSS project .BSS project includes IPCC,CRM,CBS,VAS).CRM system integrate with internal and third party system .Internal systems are (IPCC, dealer management ,e-cafe) .Third party system includes police system and INSA system. The problem is on internal integration related with IPCC, there is dalliance when IPCC communicate with CRM to display the requested data .IPCC is one channel for CRM. If CRM system stop most of IPPC operation is interrupted. To increase the performance optimization is done at some extent because directory service need to respond with good speed"*

According to the IT solution Specialist on BSS project (IPCC system) client 5, IPCC *system is integrated with CRM system to fetch customer profile from CRM system. There are some challenges regarding on their integration for example, if there CRM system fails to respond IPCC system sign out immediately sometimes it route the call to wrong skill .Skill is working based on customer profile data which are fetched from CRM system so, if CRM performance is not proper it affect IPCC system. To handle this situation CRM DB, IPCC DB are monitored periodically."*

As Vender 1 explanation the main factor which affect system integration is when client use product from different venders.

"One of the factors that challenge system Integration process is when client uses multi-vender product for example TT system is ZTE product and IPCC is Huawei."

As respondents feedback the basic challenge on integrated system is having low performance related to the response time for any request. Also using multi-vender product will make the integration process challenging. The other challenge factor is if one system fail to work it affect all systems which are integrated to it. Here is the respondents view:

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As Vender 1 explanation the main factor which affect system integration is when client use product from different venders.

"One of the factors that challenge system Integration process is when client uses multi-vender product for example TT system is ZTE product and IPCC is Huawei."

4.2.2.1.3.4 Training

As the majority of respondent feedback the training is delivered in-house and offshore but they didn't find that much satisfactory as their expectation. Although it's prepared based on venders premise.

Here is some of the respondent's feedback:

According to the IT Solution Specialist on BSS project (CRM system): client 6,"*The training is given internal and offshore. however the training is not enough at all for both operational and project team .Only 5 days training given and the training content is general it is prepared to give*

hint on the system it's not satisfactory .The training is provide based on venders premise not as per clients need ."

According to the IT Specialist on OSS project (TT system*): client 2"Training is prepared onshore and offshore .The training is not that much helpful for technical person. To fill the gap the staffs are digging by themselves."*

According to the IT Solution Specialist on BSS project (IPCC system): client 5"*The training is given on interface level not the back side which is not that much important for experts. In addition to this the training is given for persons who are not familiar to the project for example, from 7 trainers only two of them are directly involved on the project."*

According to the IT Specialist on BSS project (IPCC system) "*venders believe that they deliver enough training but in client perception it's not enough. The training is provided for functional not technical."*

4.2.2.1.3.5 Maintenance

As respondent's feedback operational and project support is communicated for venders through mail, phone and ICare system. This issue is also noted by referring the recorded mail conversation .The challenge is getting on time support and venders are not egger to transfer what they know.

Here is some of the respondent's feedback;

According to the IT Solution Specialist on BSS project (CRM system): client 6, "*If technical and operational support is requested from users which needs vender involvement it is communicated directly in person, through phone or through mail. If the request is for operation team they use ICare system to log the request and fallow the case with this manner.as challenge most of the support sent to venders it's difficult to give operational support with on hand document although venders are not eager to share their knowledge"*

According to the IT Specialist on BSS project (CRM system): client 3.*"The support is given for end users based on the given privilege .However if it is business support or beyond the capacity of company expects the case is escalated to venders through TT and mail."*

According to client 7,*"Current position of the company in the area of system development have improvement as compared to previous one .The improvement is seen on, FRS preparation, testing , documenting , training and system performance. Nevertheless, the company still have system performance and maintenance issue, which needs enormous strategy and attention*"

4.2.3 Risk factors

4.2.3.1 Contract

The exploration of the interviews shows that the main factors that need attention related to contract are clear and detail description of contract document and proper service level agreement. As shown in Table 9 and discussed below

Interview evidence	Themes	Key theme
The contract document lacks clarity and detail which requires special attention.	Lack of detail and clarity	Contract
Proper service level agreement is critical for facilitating the operation. A	SLA	

Table 9 factors in contract

As the respondent's feedback the contract document is good as compared from previous project contract. But it doesn't mean that its content clarity on satisfactory level. There are different factors which raised on contract process. This are the contract document are not detail and there is challenge on time sign on of SLA. Current hot issue in the company is SLA it's been 6 month in negotiation. The recorded mail conversation regarding on system incident also support this idea.

According to the IT Solution Specialist on BSS project (CRM system): client 6, *"The contract document is not vague as compared to previous projects. However, there are some issues which need clarity .currently the service level agreement includes operation level activities which are used after launch there is no project SLA. The other challenging factor from internal users are after the system launch they raise different comment regarding to the content of the contract and requirement. Related on the progress report venders sent the progress on regular basis during the project .But after system launch venders needs every request to come from higher level management"*

According to the Project manager (CRM & IPCC): client 1, "*The challenge related to the contract is the service level agreement issue. SLA is still not signed since the negotiation process is not settled this affect current operation .The other is the penalty mechanism for the delay of delivering each project mile stone is not clear. If this thing managed well in the contract it will be helpful*."

According to the IT Specialist on BSS project (IPCC system) client 5*, "On the contract document not all requirements are included in the required detail. When clients request support on some requirements vendors respond that it's not included in the contract. Currently the SLA period is*

ended and it's been six month since the negotiation started yet still not settled. All those things are very challenging it needs special attention of higher managements. "

4.2.3.2 Loss of IT expertise

As the interview exploration team work, trust knowledge sharing are key factors for loss of IT experts in the company as shown table 10.

Interview evidence	Them	Key them
The intention given for in-house system development is not vital. User's resistance to use the system due to trust are the other factor.	✓ Trust ✓ The intention given for in-house system development	Loss of IT expertise

Table 10 factors for the loss of IT expertise

As IT application support supervisor client 7 feedback, the intention given for in-house project is not vital. It is recommended that if the company built its own research and development center. The other challenge is factor of trust, users and the management did not trust those system which are developed internally those things increase the rate of losing IT expertise found in the company.

"From prior experience the intention given for in-house development is not satisfactory .This affect expertise moral and sense of ownership on IS staffs sometimes it leads an increase on turnover of IT expertise. The company needs to have clear plan, follow up for in-house project. It is better that company build its own research and development center. Supporting the in-house system development by providing the required training and resource helps to develop standard and secured system. The other challenge is users resist to use system developed in-house "

4.2.3.3 Relation ship

As the interview exploration the basic factors to have good relationship with outsourcing partners are team work, trust and knowledge sharing as shown table 11

Interview evidence	Themes	Key them
Team work, trust knowledge sharing are good mechanism to build good relation ship	✓ Trust ✓ Knowledge sharing ✓ Team work	Relation ship

Table 11 factors on Relationship of venders and clients

As respondent feedback to strengthen relationship between vender and client team work, built trust, and knowledge sharing is key mechanism.

Here is some of the response:

According to the IT Specialist on OSS project (TT system*): client 2,"the challenging on dealing with ZTE is that they want every request to pass through higher management."*

According to the IT Solution Specialist on BSS project (IPCC system) client 5*"from prior experience vendors was smart in terms of behavioral aspects they didn't take thing worth they are smooth even when clients are harsh on them. To build team sprit some socialization program was started but it doesn't last. Currently communication with venders other than work is strictly forbidden to prevent bias."*

According to the IT Solution Specialist on BSS project (CRM system)*: client 6,"the management didn't use any mechanism to make good relationship with venders .Venders change their ideas once agreed on meeting this lead the project team to unwanted conflict. In some point venders try to be professional to make the testing period peaceful .However from Ethio telecom management side nothing is done to prevent corruption and favorable condition. The other challenge is language barrier it's difficult to communicate easily with venders. Using refreshment or other materials is not preferable to make the relationship smother instead of this it is better if there is knowledge sharing media as precondition before any system test. This will fill knowledge gap and it let the team to communicate easily."*

4.2.3.4 Cost

Ethio telecom use total cost of ownership (TCO) principle to handle the payment .Once the total payment settled the money will be released phase by phase. Also hidden cost is not raised as challenge.

Here is respondent's feedback:

According to the Project manager (CRM & IPCC): client 1 "*The payment is done phase by phase. Payment mechanism is performed as per the contract. For example the confirmation is taken from project team and the result of acceptance test will be cross checked with contract agreement based on this the payment released. Related to cost the company didn't owe additional payment everything is goes as planned "*

According to the IT Solution Specialist on BSS project (CRM system): client 4"*Related to cost the company didn't face any hidden cost. As experience when one module tested and if it's failed repeatedly the payment is deducted from the agreement .When such case occurs venders request*

to make new functionality to compensate the payment. As a solution the current practice instead of new tender user's new requirement referred and vender's option accepted."

4.2.3.5 Decision process

As the respondent's feedback, Ethio telecom's had taken outsourcing system development as option is for several reasons .The main reason is that there is no research and development team or department which handle huge and sophisticated project. The other is lack of expertise which have technical and specialized skill in the area. Also domestic software companies did not pass the evaluation criteria. Beside this Also respondents noted that before making decision on issues regarding on system development discussion with IT professionals is important to get better result. Furthermore respondents noted that top managements required to work on creating mechanism in building trust.

Here is the explanation on issues on decision process related to system development outsourcing

According to the Project manager (CRM & IPCC): client 1, "*the company have no capacity to do such big project internally due to many factors. Also software development is not included in the company strategy. The main objective the company is giving telecom service not software development as main activity. To encourage domestic venders, the tender was open for all software providers. However all domestic venders fails during evaluation because of experience and related reasons*. "

According to the IT Specialist on OSS project (TT system) client 2,"*The reason that the company takes outsourcing as strategies seen in two ways, one is that there is no enough expertise which accomplishes such project .Also in the company there is no research development team who handle such huge project .The other is venders provide end to end service from the infrastructure up to the final service. Most of the time top management make decision without considering experts judgment on several issues however to have good result company managers must considers experts idea before making decision"*

According to the IT Specialist on BSS project (IPCC system): client 3 *"There are several reasons for outsourcing system development the major one is the need for standardize system since, the vision of Ethio telecom is Bing world class telecom service provider the company needs standard system to give better service . The challenge on internally developed system is higher managers didn't have trust on developers skill .Beside this internal staffs resist to use those systems.so top managements work on building trust"*

4.2.3.6 Security

As respondent feedback the privilege of venders is invoked after project handover. Also different security measurement ware taken to protect customer information and company sensitive data. This includes security related contract agreement.

Here is respondent feedback:

According to the IT Solution Specialist on BSS project (IPCC system): client 5,"*All data was accessible to venders during project phase .However after handover all privilege is invoked from venders and blocked with security mechanism. If modification needed they work with our user "*

According to the IT Solution Specialist on BSS project (CRM system): client 6," there is security policy t*o prevent sensitive information or customer information for both internal staff and venders. Security section follow all business log .from prior experience the project team didn't face challenge related to security."*

4.3 Finding and Discussion

There are different factors which triggers system development outsourcing process. In the previous section of the analysis part, factors which affect effectiveness of system development outsourcing process was analyzed from the perspective of the selected interviews, document analyses, observation. In this section how the outcome of the research is discussed in relation to the specific objectives, research questions, how the research is related with others literatures and studies discussed. The following table 12 summarizes the discussion as below.

S/N		Categories	Key driving forces evidence collected from the interviews
1	Factors of system development outsourcing	Requirement	Factors which affect the requirement process are end-users involvement, users change their requirement , understanding user need and empowering staffs
		Test	Factors which affect the test process are high fault rate, language barriers, test environment, training ,experience and missing requirement
		Deployment	Factors which affect system deployment are consistency, getting support, data incompleteness, pilot period, training and documentation

		Integration	Factors which affect Integration process is using multi-vender product, delay on response time.
		Training and maintenance	Training and maintenance are basic on outsourced projects for clients. However as respondent's feedback the delivered training is not satisfactory to give support for system users. Also there is problem on creating knowledge transfer mechanism
2		Contract	Factors which are basic in contract preparation and implementation are clear (detail) description of contract document and on-time sign on service level agreement
		Cost	Ethio telecom use Total cost of ownership (TCO) principle related to cost. TCO differs from a regular budget because the budget usually focuses on the immediate (or initial) costs, encompassing one time purchases. Related to cost the company didn't face any challenge
		Security	To protect security related issue contract agreement and us company regulations are used. Regarding on security issue related on customer data the company didn't face challenge
		Decision process	To have better result discussing with IT professional is very important before making decision regarding system development. Also top managements required to work on creating mechanism in building trust
		Loss of IT expertise	Factors that let the company to loss its IT experts are trust and the intention given for in-house system development.
		Relationship	To build relationship with client and venders team work, trust knowledge sharing are key factors

Table 12 factors in system development outsourcing

4.3.1 Factors of system development outsourcing from the perspective of development phase

4.3.1.1 Requirement

Ethio telecom faced different challenge regarding to requirement development and analysis. As majority of the participant noted there are different factor which need special attention during requirement preparation .This are end to end user involvement, understanding user need, User's change their requirement, empowering staffs.

The findings emphasize that giving special attention to end user involvement is very important. This finding also noted by other researchers. Other researchers also noted that end user involvement was highlighted as a key factor on requirement definition (Sujani & Nalli, 2006).
The other factor which are noted by respondent is understanding user requirement. Other researchers also prove that in order to develop useful and usable systems understanding users' needs and contexts is very important throughout the development (Sari & Marjo , 2001).

The other factor which is found as challenge on requirement process is user's change their requirement after system is implemented. Other studies shows that since requirements cannot be fully described at the start of the project, it might change continually over the development cycle. If this factor was not successfully mitigated, time and budget may overrun, testing may not cope with this continually changes (Nageldinger & Guido, 2015).

4.3.1.2 Test

As majority of the participant noted there are different factor which need special attention during system testing. High fault rate, Language barriers, inadequate Communication, Test environment, experience, missing requirement.

It's found that Language difference make the communication process challenging. Other researchers also found that if a system developed offshore language difference one barrier sometimes it may end with error result (Ramrathnam & Ahmed, 1993)

As respondent feedback some functionality are tested while the tester making the code. This will cover the fault also may lead improper product delivery. Other study also emphasize that high fault rate in newly designed components occurs when the component was developed from scratch, then it is tested and used for the first time. This means many of the undiscovered errors and faults might be revealed (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014).

Inadequate communication between testers and other system/software engineers will lead for improper result and take the test longer than planned. Other study also shows that if testers not understand the work being performed by other engineers. There will be incompatibilities between outputs and associated inputs (Donald & Firesmith, 2012).

Before making any testing task providing training to empower testers is very important. Based on observation and respondent feedback there was no prior training to do the test process. The testers are selected randomly from the team. Having sufficient expertise and experience for testing process is very essential for any project success. Other researchers also noted that provide appropriate amounts of test training (both classroom and on-the-job) for both testers and those overseeing testing is necessary to have skilled tester (Donald & Firesmith, 2012). Testing team experience has a significant influence on the testing process. Unqualified testers may destroy the whole process, since they might misuse the available tools, resources and techniques (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014).

Based on observation and respondent feedback the test is performed on staffs office three is no room reserved for test purpose. So all necessary resources must be full filled for good result. To make the testing processes effective providing sufficient test resources is crucial this includes comfortable test environment (Donald & Firesmith, 2012).

4.3.1.3 Deployment

As majority of the participant noted there are different factor which need special attention during system deployment and after deployment including integration and training issues. This are experience, pilot time, consistency, proper documentation, project time line, proper documentation, training and maintenance, end user resistance.

It's found that most functionality which work on test environment fail to work on real environment there is consistency problem. If not all faults were discovered and mitigated before system operation. The cost of discovering and maintaining such faults exceeds (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014).

As respondents feedback it's found that staffs who participate in the deployment process lacks prior experience on the area. So it is better the company works on empowering its staffs for better result. If staffs lack experience and if the system is complex it is difficult for them to install the system or it might be installed incorrectly. Other studies also shows that empowering staffs who lack experience on the system nature and functionality is very important (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014).

The finding from respondent feedback CRM system is directly deployed there was no pilot period as compared to the previous systems. Pilots are useful for testing the service with a small part of the user base before rolling it out to the whole business. Other researcher also indicate that piloting is important because it reduce the risk of propagating mistakes by detect (Roxana , 2010)

According to majority of respondent and the collected training document proved that the provided documents are not enough to understand all functionality of system and to provide technical guide for end users. In the handover of final project providing proper documentation to the owner is very important to develop safe, sustainable, operability and maintainability. (Nageldinger & Guido, 2015). One of the criteria by which a project is evaluated as successful is the quality of Handover documentation (Nageldinger & Guido, 2015).

During system launch there was challenge from user side on usability of the system they are afraid of using new system till they adopt. Other researchers study shows that difficulty in using the system is common for the end-users to find it difficult to use any newly installed system (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014).

Majority of the respondent who participant on CRM, IPCC and TT system noted that most of the outsourced system development project exceed the time line. Time contention may force the developers to discard some functionalities which might be core ones, neglect some nonfunctional requirements .Other is design quality issues and do the testing poorly in order to go in progress and deliver on time. Other studies emphasize that time is the major risk factor that threats all system development life cycle phases, mainly the implementation and testing phases (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014).

Training and maintenance are basic on outsourced projects for clients. However the observation and respondents response shows that the delivered training is not enough to give technical support for system users. Also the training is prepared by vender's premises not with client. To solve training and support issues must be devised clearly in the contract document. The contract should clearly define resources to be supplied by the vendors and the user in terms of number of person hours, qualification of personnel, calendar time when people are to be available, hardware, documentation, and training (Raoul & .Freeman, 1995).Beside this it's found that there is challenge on creating knowledge transfer mechanism from vendors to client .

The finding shows that the major challenge on system integration is due to use of multivendor product and responsiveness of system in terms of speed. When system is developed by different vendors coordination process challenging also if one system fail to work it affects the other its

prone to failure. Other researchers also emphasize that if the same component were developed by different programmers in the team, then different versions for the same component may exist, causing problems in integration (Hijazi, Haneen, Shihadeh , Hasan , & Thair , 2014). Beside this systems which are integrated have dalliance to respond the requested data.

4.3.2 Risk factor

As the finding form the interviews implication there are different risk factor that ethio telecom faces from the perspective of contract, relationship with venders, cost, IT expertise and security issues as discussed below.

4.3.2.1 Contract

The finding shows that there is lack of detail and clarity in the contract document. The contract should include clear requirements and deliverables (Jerry & Saittab, 2015). For success of offshore system development efficient contract managements very important (Khan, Siffat , Mahmood, & Rashid, 2009). Extensive efforts must be taken to ensure that every detail of the outsourcing arrangement is spelled out in the contract.

The other finding is that the negotiation time on SLA is pass the schedule time this affects the company services.

4.3.2.2 Relation ship

The finding of interviews prove that there is no trust between the client and venders. Also the company didn't support team work with outsourcing partner. To ensure the successful outcome of outsourcing projects it's necessary to strength the relationships between clients and vendors are (Khan, Siffat , Mahmood, & Rashid, 2009). For maintaining and establishing trust in system development outsourcing healthier relationship between client and vendor is mandatory (Khan, Siffat , Mahmood, & Rashid, 2009).Furthermore, the finding shows that venders are not happy to share what they know related on the project.

4.3.2.4 Decision process

As the respondent's feedback, Ethio telecom's had taken outsourcing system development outsourcing due to lack of expertise which handle big project. The finding from the interviews shows that to have better result the managements should discussing with IT experts on any amendments regarding on system development before passing any decision .The finding also implies managements need to give attention or credit for internal IT experts to build trust.

4.3.2.3 Cost

Ethio telecom use Total cost of ownership (TCO) principle related to cost. TCO differs from a regular budget because the budget usually focuses on the immediate (or initial) costs, encompassing one time purchases and the more obvious operating costs. Keeping the completeness of outsourcing contracts and associate costs in order to minimize risks is very important (Tafti & Mohammed , 2005). As the finding from the interview shows that the company didn't face any problem regarding on cost.

4.3.2.5 Lose of IT expertise

As finding from respondent implies that even if IT experts who have the capacity to code and handle complex projects there is resistance to accept their effort .Both higher management and staff are resist to use the systems which are built in-house there is trust issue. Due to this the company is susceptible to loss its IT expertise. Other researchers also have similar finding whit this idea. The risks of losing IT knowledge extend beyond inhibiting a firm's ability to efficiently provide services. Even during contract negotiations a lack of adequate IT expertise can greatly shift the advantage to the vendor (Tafti & Mohammed , 2005).

4.3.2.6 Security

As respondent feedback the company didn't face regarding on security .One of the measure that the company uses to protect privacy of customer information is through contract. Beside this company have its own rule and regulation in protecting customer's data. One of the major factors that can substantially reduce the risks of privacy and security infringement is existence of practical and relevant laws and regulations (Tafti & Mohammed , 2005).

4.3.3 Proposed Conceptual Framework

The proposed framework is based on reuse of existing models found in the literature located in Figure 2 & Figure 3.The results of this research stimulate an improved conceptual model it includes factors found from empirical investigation as illustrated in Figure 18.

This revised proposed conceptual framework provides a more holistic understanding of the key Factors which facilitate or inhibit system development success in the context of outsourcing to Ethio telecom. As shown in Figure 4.1, the framework suggests that system development process affected by 13 main factors which is categorized as outsourcing risk factors and factors of system development

There are several factors which affect the success of system development outsourcing process categorized under requirement preparation, test, and deployment process. For the success of requirement, process end to end user involvement, understanding user need, clear requirement and empowering staffs who involve in the requirement process are key factors. Factors which affect the test process are Language, high fault rate, test environment, experience and requesting new issue by missing the requirement. Factors which affect system deployment categorized in to three part this are system integration, data migration and cutover. In general key factors which affect the effectiveness of system development process are experience, pilot time, consistency, project time line, proper training and getting support.

Factors which affect system development effectiveness which is considered as outsourcing risk factor from the point of contract, relationship with venders, cost, IT expertise, decision process and security. As the finding implies providing detail and clear documentation is very crucial also the SLA sign on time must be durable. Factors which have high impact for the success of good relationship between client and venders are team work, building trust and knowledge sharing .Factors which affect IT professionals is trust this impacts the availability of local IT knowledge in the company. As the finding noted to get better result discussing with IT professionals before making decision regarding on system development is important .Also top man agents must work on building trust between client and venders. Furthermore the study finding implies currently the company did not face any issue regarding cost and security.

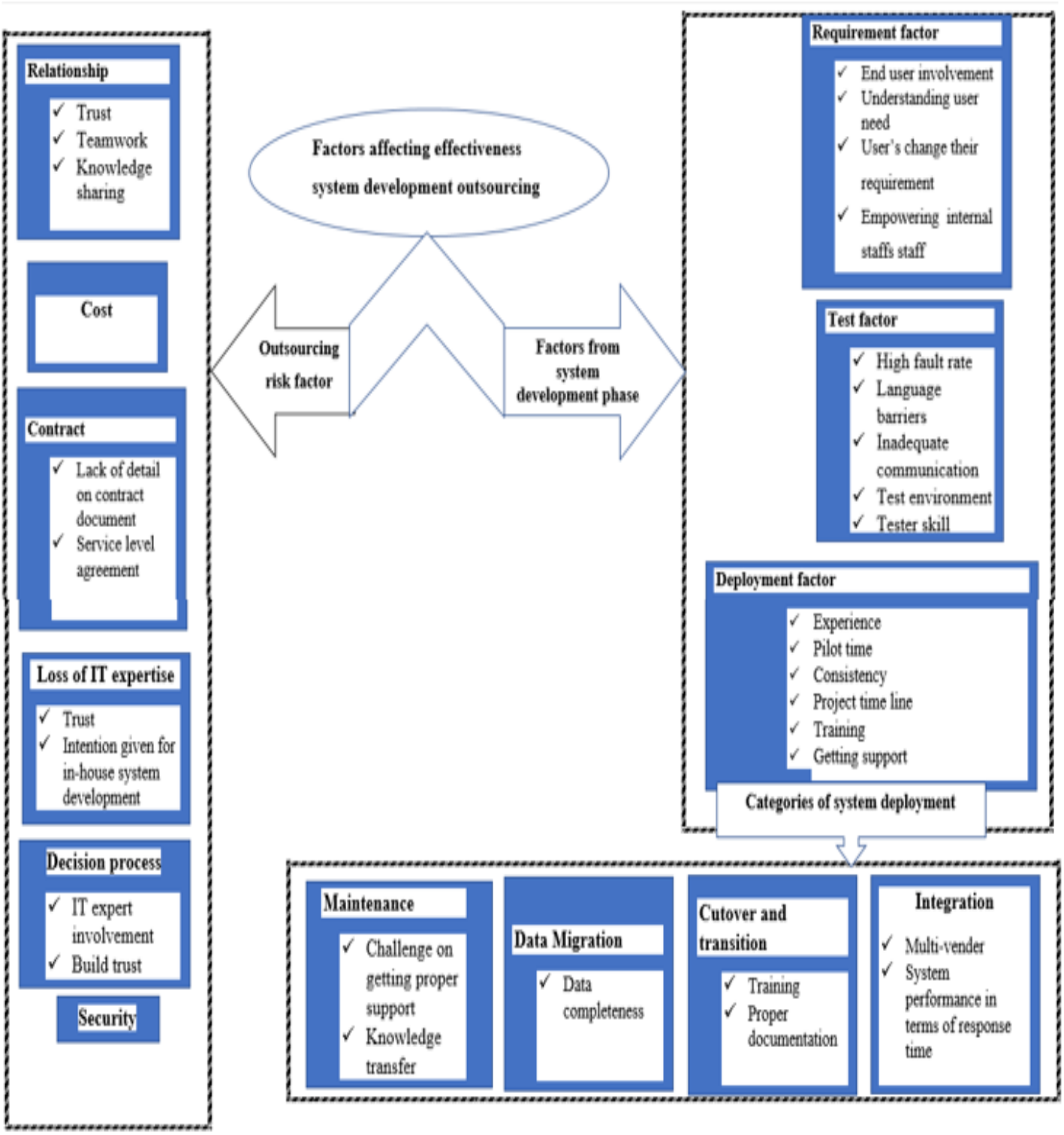

Figure 4 Revised proposed conceptual framework on factors of system development outsourcing

Experts in the company validate the proposed conceptual framework. Expertise commented that it provides a more holistic understanding of the key factors of system development outsourcing which inhibit for the success outsourced project at Ethio telecom.

4.4 Chapter Summary

Information system Development outsourcing had different factors which contribute for its success. To assess the benefits and challenges of Information system development outsourcing function the researcher took Ethio telecom as case organization .The objective is assessing factors of system development .In order to achieve the required objective of the study interview questions derived from the objective result are analyzed and interpreted in this chapter. To manage the interviews analysis, the researcher organized the analysis and interpretation in to: Factor of system development outsourcing (from system development life cycle process & other outsourcing risk factor)

CHAPTER FIVE: Conclusion and Recommendations

5.1 Conclusions and Recommendations

Outsourcing Information system development is currently growing at significant level in Telecom Company. It is the practice that refers to shifting corporate activities of an organization to external party vendor either within the country or outside the country so that the organizations can concentrate on its core business. System development function outsourcing is also one of one of the company strategizes because of several reasons.

The main objective of the research to provide an understanding and analysis of the key factors which need attention for effective implementation of system development outsourcing for Ethio telecom .In this research assessment of different literatures related to outsourcing information system development function are done.

To achieve the objective of the research the study employed a qualitative case study approach using multiple methods of data collection methods used this are semi structure interview, observation and documents. Purposive sampling techniques are utilized for selecting eleven employees who had an ample knowledge and had been participating in the outsourcing projects in the areas of information system development for interview. Detailed investigation and understanding on factors of system development outsourcing process on OSS (TT) & BSS (IPCC, CRM) project at Ethio telecom from multiple participants with different views, perceptions and experiences are provided.

Key findings yielded from empirical investigation identifies factors that impact system development process and the performance of final system.

System development factors

- Requirement(end user involvement , understanding user need , user's change their requirement , empowered staff)
- Test(High fault rate, language barriers, inadequate communication, test environment, Tester skill
- Deployment(Experience, pilot time ,consistency ,proper documentation, project time line)
    - ✓ Data migration (Data completeness)
    - ✓ cut over(proper documentation, training)
    - ✓ integration(Multi-vender, responsiveness)
    - ✓ maintenance (challenge on getting support, knowledge transfer)

Outsourcing Risk factors

- Contract (Lack of detail on contract document, service level agreement)
- Cost
- Security
- Loss of IT expertise(Trust, intention given for in house system development)
- Relationship (Trust, teamwork, knowledge sharing)
- Decision process(build trust, IT professionals involvement)

This study identifies several factors that affect system development outsourcing. From the identified factors the most critical ones are categorized under requirement, testing, deployment, data migration cutover, training and maintenance, contract, cost, security, loss of IT expertise, and relationship process .It is clear that most of the identified factors have significant impacts on system development outsourcing.

5.2 Recommendations for Practices

From the identified factors the most critical ones that have an impact on performance of final system are categorized under requirement, testing, deployment, data migration cutover, training, maintenance, contract, loss of IT expertise, and relationship process. Therefore by critically considering the identified factors during system development process the company can prevent issues raised related to performance.

Those factors which are identified in this study can serve as a checklist that can guide project team in identifying probable risk factors and help them in designing strategies to mitigate and avoid the problems. Although, by carefully understanding the key factors which triggers effectiveness system development outsourcing, a more comprehensive strategy guiding can be devised.

To run the operation efficiently the company should give high focus on contract management to have clear requirements and deliverables. Beside this the negotiation time taken for the SLA singe on must be durable. Extensive efforts must be taken to ensure that every detail of the outsourcing arrangement is spelled out in the contract.

Maintaining and establishing good relationship between client and vender is very important for the success of any project. The company must give attention on building good team sprit this helps to build trust and to have healthier relationship. Also it is recommended that the company provide knowledge sharing medium from venders to client.

As the study shows Company have shortage of experienced IT expertise. So, the company must give attention for internal IT expertise also its better if the company build its own research and development center to encourage internal expertise.

5.3 Recommendations for Future Research

This research provides draws valuable lessons with regard to system development outsourcing, however there are some limitations which are open for future research.

- This study more focus on identifying factors on system development from the perspective offshore outsourcing. Future researches can be done on from the perspective of in house system development process.
- This study is a single case and specific to the telecom sector, future research conducted in other different environments that would verify the findings of this study and may yield additional insights.
- Conducting future study on system development outsourcing with multiple case study with different environment can be done or a comparison between public sectors/telecom with other organization can be done.

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Appendix 1

Interview question guides

Interview questions	Category used for interview questions	Respondent category
1. Your role in the organization? **2.** How long you have been working in the organization. **3.** How much prior experience has your organization had with outsourcing? How large is your organization?	General questions	**Vender**
4. What was the most important reason to acquire this project for you*(CRM, IPCC and TT)? **5.** What are the Problems encountered in (CRM, IPCC, and TT) System development? a) During initial Stages (project start-up)? b) During requirements analysis? c) During design? d) During implementation? e) During programing and testing? f) During integration? Which risks did you see while integrating your service/product with the existing product/service of the customer? (e.g. interface compatibility) (IPCC & CRM integration) g) System testing? How did you test your system? Give example to see if they match with the requirements and which risks occurred while testing? h) During deployment (cutover, data migration, transition and maintenance)? **6.** Specific strategies and coordination mechanisms used to address the problems Identified in #5 above. Steps taken by you and your team and by the client? **7.** Has a client ever claimed that the system you delivered failed to perform properly?	System development Outsourcing process from (SDLC view)	

a) If so, what do you think was the source of their dissatisfaction? Was that reasonable? b) Did the client express its dissatisfaction *during development* or *after* the final delivery? c) How is SLA issue handle (its implementation in general) d) If the client expressed dissatisfaction after final delivery of system how do you handle it? e) Has your organization been sued for breach of contract? f) If so, what was the alleged breach? g) Did you retain a lawyer? h) How was the matter resolved? **8.** Have you ever sued a *client* for breach of contract? a) If so, what was the alleged breach? b) Did you retain a lawyer? c) How was the matter resolved?		
1. How many years have you been involved in system development or IT management? **2.** What was your role in the system development projects you've worked on? **3.** Have your projects been mostly large projects with large budgets and many members of the team, or smaller projects (single contractor or small team)?	Respondent background	**Client**
4. Why did your organization choose outsourcing over in house development? **5.** Why did your organization choose international outsourcing over domestic outsourcing? In other words, why have you outsourced to foreign countries instead of inside the country to some other companies?	Decision process	

6. Who was the external vendor involved in the system development (CRM, IPCC and TT)? Where was the vendor located? Did your organization have any prior experience with this vendor? **7.** What do you think of the factor of trust when selecting outsourcing vendors? **8.** How to build trust with venders. **9.** What is your expectations regarding on management's decision related with system development outsourcing **10.** Which are the common negative consequences of international outsourcing and which measures were taken to avoid these negative consequences (in case of IPCC, CRM and TT system)?		
11. Did you and your organization have certain expectations other than those included in the contract? Did you feel the vendor did?	Contract	
12. What kind of problem encountered in managing relationship and how did you or your team overcome the problem?	Relationship	
13. How the cost is related issues managed? Did you adopt a customized payment mechanism? What problems were encountered in this phase?	Cost	
14. What are your security and confidentiality guidelines in protecting sensitive information? **15.** Have you experienced obstacles to project success related to technical security problems? If yes what measures are taken/ how do you or your team handle such issues?	Security	
16. How do you feel about your company's position or activity in the area of System development outsourcing?	Loss of IT expertise	

17. What do you think your company could do to improve employee commitment levels during System development outsourcing?		
18. Please describe the requirement analysis process. How did your organization and the vendor interact during this? What coordination mechanisms were used?	Requirement	
19. How the produced System was tested (CRM, IPCC and TT system test performed)? **20.** How many different types of tests did you conduct?	System Testing	
21. What are the main problems have you encountered in system deployment process (data migration and cutover)? What was impact have these problems had within your organization? What suggestions do you have for remedying the problems?	Deployment	
22. How the ready software products along with the documentation were delivered? **23.** Did the outsourcing service provider report to you about the progress on a regular basis? How did they report?	Delivery of the products and documentation	
24. In which areas did you got training? **25.** Was the training provided at your premise or the outsourcing service provider's premise? **26.** How you handle maintenance or support request from system users.	Training & maintenance	