ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

ASSESSMENT OF THE RISK MANAGEMENT PRACTICES OF ETHIO-TELECOMS' FIXED BROADBAND SERVICE EXPANSION AND UPGRADING PROJECT: THE CASE OF CENTRAL NORTH REGION, DEBRE-BERHAN

PREPARED BY: ABREHAM ABEBE

MARCH 2024
ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

ASSESSMENT OF THE RISK MANAGEMENT PRACTICES OF ETHIO-TELECOMS FIXED BROADBAND SERVICE EXPANSION AND UPGRADING PROJECT: THE CASE OF CENTRAL NORTH REGION, DEBRE-BERHAN

BY
ABREHAM ABEBE

A RESEARCH PROJECT WORK SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A MASTER OF ARTS DEGREE IN PROJECT MANAGEMENT

ADVISOR SEIFU MAMO (PhD).

MARCH, 2024

ADDIS ABABA, ETHIOPIA

DECLARATION

I, Abreham Abebe, declare that this research entitled "Assessment of The Risk Management Practices of Ethio-Telecoms Fixed Broad-Band Service Expansion and Upgrading Project: The Case Central North Region, Debre-Birhan" is the outcome of my own effort and study. All sources of materials used for the study have been duly acknowledged. This study has not been presented for a degree in any university.

Abreham Abebe	_____	_____
Candidate	Signature	Date

CERTIFICATION

This is to certify that Abreham Abebe has carried out his project work on the topic entitled "Assessment of The Risk Management Practices of Ethio-Telecoms Fixed Broad-Band Service Expansion and Upgrading Project: The Case Central North Region, Debre-Birhan" under my guidance and supervision. Accordingly, I hereby assure that his work is appropriate and standard enough to be submitted for the award of Master of Arts Degree in Project Management.

Seifu M. (PhD)	_____	_____
Name of Advisor	Signature	Date

APPROVAL

The thesis entitled "Assessment The Risk Management Practices of Ethio-Telecoms Fixed Broad-Band Service Expansion and Upgrading Project: The Case Central North Region, Debre Berhan" Submitted by Abreham Abebe in partial fulfillment of the requirements for the award of a Master's Degree in Project Management to the school of commerce department of Project Management; the University of Addis Ababa compiles with the regulations of the university and meets the accepted standards with respect to originality and quality for the award of Master's degree in Project Management.

Seifu M. (PhD)	_____	_____
Name of Advisor	Signature	Date
Wasihun M. (PhD)	_____	_____
Internal Examiner	Signature	Date
Maru S. (PhD)	_____	_____
External Examiner	Signature	Date

ACKNOWLEDGEMENT

I would like to express my deepest gratitude & thanks to the almighty GOD. In addition, I would like to thank my advisor Dr. Seifu Mamo, my family, friends & all who have done good deed for me in achieving this degree & day. Last but not list I'm grateful for my colleagues and project participants who have been helping me truly & with what I needed.

Table of Contents

LIST OF TABLES

LIST OF ACRONYMS

4G/LTE	Long Term Evolution
ADSL	Asymmetric Digital Subscriber Line
BB	Broadband
CDMA	Code Division Multiple Access
CS	Core Switch
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
DWDM	Dense Wavelength Division Multiplexing
EPON	Ethernet Passive Optical Network
FBB	Fixed Broadband
FBBS	Fixed Broadband Service
FL-NGN	Fixed Line-Next Generation network
FTTC	Fiber to the Cabinet
FTTH/B	Fiber-To-The-Home/Building
GDP	Gross Domestic Product
GNIpc	Gross National Income per capita
GPON	Gigabit Passive Optical Network
IPNGN	Internet Protocol Next Generation network
IPOE	Internet Protocol over Ethernet
MDU	Multiple Dwelling Unit
MSAG	Multi-Service Access Gateway
MSAN	Multi-Service Access Node
OLT	Optical Line Terminal
PM	Project Management
PPPOE	Point to point Protocol Over Ethernet
PRM	Project Risk Management
RBS	Risk Break-down Structure
RMP	Risk Management Process
SPSS	Statistical Package for the Social Sciences
TCP/IP	Transmission Control Protocol/Internet Protocol

VDSL	Very High-speed Digital Subscriber Lines
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal
Wi-Fi	Wireless Fidelity
WiMAX	Worldwide Interoperability for Microwave Access

ABSTRACT

The main purpose of this study was to assess the project risk management practices in Ethio-Telecoms FBBS expansion and upgrading project through examining the risk management processes which include the planning, identification, qualitative & quantitative analysis, response planning, response implementation, and monitoring of the risks within the project. The study applied a descriptive research design and quantitative research approach. Primary data was collected by a census survey conducted on 20 project participants using a close-ended questionnaire. The data collected was analyzed using IBM SPSS Statistics for windows and the numerical results with frequency, percentage, mean & standard deviation are presented in tabular form. The findings revealed that the average mean value of risk planning 3.83 suggests that most project participants agreed with the risk planning process. This indicates their recognition of the importance of scientific PRM planning, stakeholder involvement, utilization of tools and techniques, training, and the integration of the risk management plan within the project management plan. The average mean value of risk identification 3.85 suggests that most project participants agreed with the risk identification process. This indicates their recognition of the importance of identifying factors, utilizing inputs, engaging team members, using tools and techniques, maintaining a continuous process, and producing outputs. The average mean value of qualitative risk analysis 3.75 suggests that most project participants agreed with the qualitative risk analysis approach. This indicates their recognition of the use of inputs, risk matrix, tools and techniques, consideration of risk characteristics, use of factual information and data, and updating of project documents. On the other hand, the average mean value of quantitative risk analysis 3.87 indicates that most project participants agreed with the quantitative risk analysis approach. This implies their recognition of the use of inputs, tools, and techniques, numerical analysis of risks, clear identification of project risks, and the production of outputs such as updated project documents. The average mean value of planning risk response 3.7 suggests that most project participants agreed with the risk response planning process. This finding aligns with existing literature on risk management, which emphasizes the importance of proactive risk management and effective risk response planning for project success. The average mean value of Risk response implementation is 3.78 suggests that most project participants agreed with the implementation of risk response. This finding aligns with the previous findings that indicated general agreement and support for risk response planning and implementation. Also, the average mean value of risk monitoring 3.7 suggests that most project participants agreed with the risk monitoring process. This finding aligns with the previous findings that indicated general agreement and support for risk management practices. The researcher recommends exerting the attention & effort of the project participants on the points where minor gaps & neutral responses of the respondents are identified.

KEY WORDS: FBBS, Project Risk Management, Risk Management Processes.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

A project is a temporary endeavor undertaken to create a unique product, service, or result. Unique product, service, or result. Projects are undertaken to fulfill objectives by producing deliverables. An objective is defined as an outcome toward which work is to be directed, a strategic position to be attained, a purpose to be achieved, a result to be obtained, a product to be produced, or a service to be performed. A deliverable is a tangible or intangible product, result, or capability that is unique and verifiable to perform a service that is required to be produced to complete a process, phase, or project. The end of the project is reached when one or more of the following is true: The project's objectives have been achieved; the objectives will not or cannot be met. A project is aimed at moving an organization from one state to another state to achieve a specific objective. Projects enable business value creation. PMI defines business value as the net quantifiable benefit derived from a business endeavor. The benefit may be tangible, intangible, or both (Project Management Institute 2017).

Risks in project management are defined as uncertain events or conditions that, if they occur, have the potential to impact project objectives either positively or negatively. According to the Project Management Institute (PMI), risks are defined as "an uncertain event or set of circumstances that, should it occur, will affect the achievement of the project's objectives" (PMI, 2021).

Fixed-broadband subscriptions refer to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 Kbit/s. This is classified as, Fixed Wired BB: which includes cable modem, DSL, fiber-to-the-home/building (FTTH/B), & other fixed (wired)-broadband subscriptions (like power-line* communications, etc.), and Fixed Wireless BB: which includes satellite broadband (like VSAT) & terrestrial fixed wireless broadband (like AiroNET). It should include fixed WiMAX and any other fixed wireless technologies. It includes both residential subscriptions and subscriptions for organizations. It also clarifies Wi-Fi networks considered as FBB are: Wi-Fi used on top of other fixed-broadband subscriptions to distribute the signal at home, Wi-Fi used as a last mile technology and associated with a specific monthly fixed-broadband contract, and Wi-Fi hotspots (public, private, free, paid) (ITU 2018).

Fixed wired broadband Internet is a high-speed Internet service provided through copper or fiber with different access methods like ADSL, VDSL, EPON, and GPON. Fixed Wired Broadband Internet service is provided with limited and unlimited usage Options: Limited Fixed Wired Broadband Internet service is a packaged service based on volume; mainly targeting residential customers. This offer is provided in 1GB, 2GB, 4GB & 6GB monthly packages. Unlimited Fixed Wired Broadband Internet service is unlimited in volume and sold with a fixed monthly rent with different access speed options starting from 256Kbps; the payment is one fixed monthly payment irrespective of the volume of usage (Ethio-telecom 2020).

Ethio-telecoms IPCORE or IPNGN network is established to carry GSM/CDMA/FL-NGN and Broadband services. The whole network is divided into two planes: Plane A and Plane B. Plane A only carries CDMA and DATA services and Plane B carries GSM and FL services to guide users' traffic properly and optimize link load. In case Plane A has problems, CDMA and DATA service traffic will switch to Plane B; and vice-versa. Its architecture consists of three layers: core/backbone, distribution/aggregation, and access/edge layers. The core layer includes Gateway, Backbone, and Route-reflector/Core routers which incorporate connecting to external networks(internet), traffic forwarding, reflecting VPNV4 route, and high capacity communication facility. The distribution layer connects the Core layer with access layers in which every data & internet configuration is performed and contains the Edge Router/ER, broadband Remote Access Server/ BRAS, and General Excellent Router/GER. The access layer is where broadband access devices & Ethio Telecom's other networks are connected (entry point for access media). Ethio-telecom provides broadband services based on media type connected to the ET IP NGN network: fiber and copper-based services (Mohamed 2022).

The company is working on the expansion of the broadband network, intending to expand its customer base by 215pc to 669,400 users. For this, it is upgrading and swapping 910 multi-service access gateways (MSAG), devises that connect customers' telephone lines to the core network to provide telephone and broadband services. It is also installing 202 new MSAG devices (Addis Fortune 2023).

According to (Hadera 2020) Managing risks and preparing a risk management plan will help the project to identify and estimate the level of the impact of the risk and help with prior preparation

for risk impacts. It assessed the practice risk management of IT projects in Ethiopian Airlines Digital Project Management Office (PMO) by examining risk management processes. He found moderate the mean value for each risk management process and Most of the risk management practices were used with some differences between theoretical risk management & actual practice of risk management in the study area and suggests the organization to improve those differences.

Risk is a threat that, if not properly managed, can negatively impact a project's success. For any size project, risk management is an essential component of project management. The success of information technology projects greatly depends on risk management; yet, these techniques are not always applied in practice. The findings of the study showed the risk identification, qualitative risk analysis, monitoring, and control were fairly practiced. While the practice of risk planning and risk response was poor. Whereas, the practice of quantitative risk analysis was very poor. It is recommended to look into best practices to apply standard project risk management processes, tools, and techniques in future projects to achieve projects' objectives successfully (Andenet 2018).

Project risk management is more than merely identifying, evaluating, and treating risks and has become an important part of the overall project management process. Neglecting or avoiding it would be disastrous. If risk management is applied to all projects in a company, the effectiveness could also be determined by closely monitoring the cost of the risk management activities and comparing that against the cost that resulted when risk events occurred, and the cost of risk events that could have occurred but did not (Kohlmeyer 2012). Active and structured risk management in the project is one of the key success factors in the project. is a critical issue to standardize and actively manage the risk management process which made risk management one of the success factors of the entire project (Artur 2018).

The FBBS expansion and upgrading project is conducted on the access layer of the IPCORE and IPNGN network by: upgrading existing access devices to their current version, installing new access devices to replace (share load) with old ones, relocating access devices from low-to-high-demand areas, expanding/installing accessibility (access devices) to new areas. The proposed study aims to assess the risk management practices used by Ethio-Telecom in FBBS expansion and upgrading projects. so that valuable lessons can be learned and suggestions can be made for future project initiatives.

1.2 Statement of the Problem

According to the PMB book, project risk management has six processes: Plan risk management, Identify risk, Perform qualitative risk analysis, perform a quantitative risk analysis, plan risk response, and monitor and control risks (Project Management Institute (PMI), 2013). Rodrigues-da-Silva et al, (2014) state that project risk management has six processes: (1) Identify risks (2) Analyze and evaluate risks (3) Plan and act against the risk (4) Control the risks (5) Report and Integrate Against the risks and (6) Support risk project management(Rodrigues-da-Silva & Crispim, 2014). The research gap identified in the literature review is the lack of organized and systematic risk management practices in projects undertaken in Ethiopia, including the specific context of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Berhan. The existing literature and research studies conducted in Ethiopia indicate that risk management practices in projects are either nonexistent or insufficiently implemented.

Different projects seem to identify and analyze risk more randomly than in an organized and systematic way. Many projects don‘t seem to make risk management part of their project management plan either. From the articles and research done by different practitioners, we can see the importance of risk management in projects but there seems to be a problem in the approach projects are managing risk. According to research done by Yimam (2014), the risk management maturity survey indicates that practically there are little or no risk management practices in projects undertaken in Ethiopia. In line with this, several types of research were being conducted regarding project risk management practices in projects undertaken in Ethiopia (e.g. Getachew, 2014; Temesgen, 2015; Frezewud, 2016; Kalkidan, 2017; Bereket, 2017 and others). And other few studies have been done relating to project risk management in Ethiopia. However, prior literature in Ethiopia has left not enough documentation on project risk management. The research gap identified in the data is the lack of organized and systematic risk management practices in projects undertaken in Ethiopia, including the specific context of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Berhan. The existing literature and research studies conducted in Ethiopia indicate that risk management practices in projects are either nonexistent or insufficiently implemented. To fill this research gap, the study focused on proposing and implementing a structured and comprehensive risk management framework for the Ethio-Telecoms project.

The research gap identified in the study is the need to assess the risk management practices of Ethio-Telecoms in the context of its changing environment, including market competition and organizational restructuring. The establishment of the Strategic Planning & Program Management Division indicates the company's recognition of the importance of project management. However, there is a gap in understanding the effectiveness of the risk management practices employed within this division and how they align with the changing dynamics of the ICT/Telecom industry in Ethiopia. To fill this research gap, the study was focused on evaluating the risk management practices within Ethio-Telecoms' Strategic Planning & Program Management Division. This involved examining the processes, tools, and techniques used for risk identification, analysis, response planning, and monitoring.

Based on a model run for 139 countries (general fixed broadband model), an increase of 10 percent in fixed broadband penetration yielded an increase of 0.8 percent in gross domestic product (GDP) per capita (ITU 2019). According to price data collected by ITU in 2022G.C the Ethiopian FBB service affordability is ranked 156th out of 179 countries based on Gross National Income per capita(GNIpc) scoring 16.34%GNIpc with the price of $9.69 for 2Mbit/sec speed of FBB (ITU 2022). The research gap is the disparity between the positive impact of fixed broadband penetration on GDP per capita and the relatively low affordability of fixed broadband services in Ethiopia. While an increase in fixed broadband penetration has been shown to contribute to economic growth, the data indicates that the affordability of fixed broadband services in Ethiopia, as measured by the price relative to Gross National Income per capita, is comparatively low. To fill this research gap, the study focuses on examining the factors influencing the affordability of fixed broadband services in Ethiopia and proposes strategies to improve affordability while promoting increased penetration and adoption.

Ethiopia’s ICT landscape is rapidly evolving. The current contribution of the communication sector to GDP is approximately 2%, compared with the 4% average in the East Africa region. Ethiopia’s wireless penetration stands at 56.2%, as compared to the Sub-Saharan average of 75%. Fixed and mobile line telephone density, which shows mobile plus fixed telephone subscribers per 100 inhabitants, was 1% and 54%, respectively, in 2020/21. Most services, such as mobile, fixed, IP, VolP, and VSAT, were government-owned and/or operated by Ethio Telecom until Safaricom joined the market (International Trade Administration 2021). The

research gap is the disparity between the current contribution of the communication sector to Ethiopia's GDP and the regional average in East Africa. Additionally, there is a gap in telephone density, specifically for fixed lines, which is significantly lower than the Sub-Saharan average. The entry of Safaricom into the market as a new player also introduces changes to the telecommunications landscape. However, the data does not provide insights into the specific impacts of these developments on Ethiopia's communication sector and the potential challenges or opportunities they present. To fill this gap, the study focused on analyzing the factors influencing the contribution of the communication sector to Ethiopia's GDP and the implications of the entry of Safaricom into the market.

The company has begun implementing its newly devised three-year LEAD Growth Strategy starting from July 01, 2022, with a vision of providing services beyond connectivity, enabling inclusive growth by providing digital and financial services and simplifying the daily activities of organizations and individuals. In the 2015 fiscal year, our company plans to make multifaceted efforts to provide quality services that increase customer satisfaction and improve experience, especially through network and system capacity enhancement and improvement projects to secure the company’s market share, as well as new technologies to provide services. Data traffic growth-based expansions of 3G and 4G/LTE Advanced services, network capacity and coverage enhancement activities, 5G pre-commercial expansion, backhaul and transport network capacity enhancement activities, Fixed broadband capacity enhancement, enterprise, solutions, mobile money and digital financial services, cloud services, Operations support system and Corporate Solutions projects as well as security solutions and technologies to provide new services and various civil construction projects are planned to be implemented (Ethio telecom, 2023).

Projects are associated with risks both negative and positive meaning things may not go well as planned. Projects are singular corporate ventures that are huge, complex, and frequently require major financial investments and cutting-edge technology. These projects are full of risk and uncertainty by nature since they are so closely tied to people and organizations. These risks must be recognized, comprehended, and managed to realize the significant rewards and opportunities that result from the successful completion of projects. A project organization must be dedicated to risk management throughout the entire project if it is to be effective. During the project,

effective risk management should be actively sought after at all levels of the business. Project risk could already be there when a project is launched. Without a proactive approach to risk management, moving forward with a project is likely to result in more issues from mismanaged dangers.

To accommodate the rising demand for high-speed internet connectivity, Ethio-Telecom has been extending its fixed broadband services. These projects are not without risk, though. The successful management of the risks involved in these projects is essential to their success. The issue is that an in-depth analysis of the risk management techniques used in Ethio-Telecom's project to expand and upgrade fixed broadband service in the Central North Region of Debre-Berhan is lacking. Although Ethio-Telecom has adopted risk management procedures, it is unknown how well these procedures can reduce the project's hazards. Whether Ethio-Telecom is effectively managing the project's risks is difficult to say without a detailed evaluation of the risk management procedures.

1.3 Research Questions

This study addresses the following research questions based on problems identified in the previous section.

1) How effective are the risk planning practices in the implementation of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan?

2) To what extent are the risk identification practices employed in the project management of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan, considered adequate?

3) What are the different risk analysis methods utilized in the assessment of potential risks associated with Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan?

4) How thorough are the risk response planning strategies developed for addressing identified risks within Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan?

5) How efficient are the risk response implementation measures taken during the execution of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan?

6) How effective are the risk monitoring mechanisms in place for tracking and managing risks throughout Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan?

1.4 Objectives of the Study

1.4.1 General Objective

The main objective of the study was to assess the risk management practices of Ethio-Telecoms' Fixed Broadband Service expansion and upgrading project: The Case of Central North Region, Debre-Birhan.

1.4.2. Specific Objectives

The specific objectives of the study were:

1. To assess the effectiveness of risk planning practices in the implementation of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan.
2. To evaluate the adequacy of risk identification practices employed in the project management of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan.
3. To analyze the different risk analysis methods utilized in the assessment of potential risks associated with Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan.
4. To examine the thoroughness of risk response planning strategies developed for addressing identified risks within Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan.
5. To evaluate the efficiency of risk response implementation measures taken during the execution of Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan.
6. To assess the effectiveness of risk monitoring mechanisms in place for tracking and managing risks throughout Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan.

1.5 Significance of the Study

There is little known about the practices of risk management in Ethio-Telecom projects and there is a gap in risk management in telecom projects within the country. The findings & recommendations of this study show how risk management is practiced within the project (at the individual risk management process level) and plays a role in giving new outlooks for both project practitioners & academia. It also provides valuable information for the improvement and growth of risk management practices within Ethio-telecom (for project participators, executive managers, & strategists) and to other companies of the same domain. The findings of this study serve as reference/input for future studies or research on project risk management, especially for those who focus on telecom projects since it's based on knowledge of the past literature on risk management practices.

1.6 Scope of the Study

Geographical Scope: The study focused specifically on the Central North Region, Debre-Birhan in Ethiopia. It examined the risk management practices implemented in the Ethio-Telecoms' fixed broadband service expansion and upgrading project within this region.

Conceptual Scope: The study explored various aspects of risk management practices related to the implementation of the fixed broadband service expansion and upgrading project. It covered risk planning, risk identification, risk analysis methods, risk response planning strategies, risk response implementation measures, and risk monitoring mechanisms.

Methodological Scope: This study used descriptive research designs and a Quantitative research approach. The scope of the study is limited to the period from May 2023 to March 2024.

1.7 Limitations of the Study

The study was focused on the assessment of risk management practices primarily on quantitative data collection methods, such as surveys or questionnaires. This limited the collection of qualitative data. The study also, focused specifically on Ethio-Telecoms' fixed broadband service expansion and upgrading project in the Central North Region, Debre-Birhan. The findings limited generalizability to other regions or projects within Ethio-Telecoms or other telecom companies.

1.8 Definition of Terms

Fixed Broadband Service Expansion and Upgrading Project: This refers to a specific project undertaken by Ethio-Telecoms to expand and enhance its fixed broadband services in the

Central North Region, Debre-Birhan. It involves activities aimed at improving the infrastructure, capacity, and quality of the fixed broadband network to provide faster and more reliable internet services to customers in the designated region.

Risk Analysis Methods: These are the approaches and techniques used to assess and analyze identified risks in the fixed broadband service expansion and upgrading project. Risk analysis methods involve evaluating the likelihood of occurrence, potential impact, and interdependencies of risks to prioritize and understand their significance.

Risk Identification Practices: These refer to the methods and techniques used to identify potential risks associated with the fixed broadband service expansion and upgrading project. Risk identification practices involve systematically identifying and documenting risks that could impact project objectives, stakeholders, or the overall success of the project.

Risk Management Practices: These refer to the strategies, processes, and activities employed by an organization to identify, assess, mitigate, and monitor risks throughout a project or operational activities. Risk management practices involve systematic approaches to managing uncertainties and potential adverse events that could affect project objectives or organizational goals.

Risk Monitoring Mechanisms: These are the processes and systems in place to track, assess, and manage risks throughout the fixed broadband service expansion and upgrading project. Risk monitoring mechanisms involve ongoing monitoring and evaluation of identified risks, their status, and the effectiveness of risk response measures, to take timely corrective actions if needed.

Risk Planning Practices: These are the activities and processes involved in developing a risk management plan for the fixed broadband service expansion and upgrading project. Risk planning practices include the identification of potential risks, their prioritization, and the development of strategies and actions to mitigate or address those risks.

Risk Response Implementation Measures: These refer to the activities and actions taken during the execution phase of the fixed broadband service expansion and upgrading project to implement the planned risk response strategies. Risk response implementation measures involve putting into action the identified risk mitigation or contingency plans and monitoring their effectiveness.

Risk Response Planning Strategies: These are the actions and measures developed to respond to identified risks within the fixed broadband service expansion and upgrading project. Risk response planning strategies involve determining appropriate risk response options, such as risk avoidance, risk mitigation, risk transfer, or risk acceptance, and developing contingency plans to address potential risks.

1.9 Organization of the Study

This study contains five chapters. Chapter one deals with the introductory parts of the study compromising; the statement of the problem, the general & specific objectives of the study, research questions, the significance of the study, and delimitation & limitations of the study. Chapter two reviews literature related to the study. Chapter 3 focuses on research design and methodology including methods of data collection and data analysis for the accomplishment of study objectives, Chapter four is dedicated to data presentation & analysis and Chapter Five provides a conclusion and possible recommendation depending on the findings. The other miscellaneous part includes references, questionnaires, and Consent forms.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter is about providing deep concepts and insights into the practices of the risk management process through a review of both theoretical and empirical literature in the past. This portion also gives an insight into the project in question through an overview. It tries to show the relation or connection of existing literature to this study, which paves a way in identifying design and methodology for meeting its objectives.

2.2 Overview of Ethio-Telecoms FBBS Expansion and Upgrading Project in Central North Region, Debre-Birhan

The project conducted on the access layer of the IPCORE and IPNGN network by: upgrading existing access devices to their current version, installing new access devices to replace (share load) with old ones, relocating access devices from low-to-high demand areas, expanding/installing accessibility (access devices) to new areas which was taken on a total of eighty-three access devices. The list of access devices in question includes: DSLAM, MDU, MSAG, and MSAN. These access devices are purchased from and installed with cooperation of two vendor companies namely ZTE Corporation and Huawei Technologies PLC.

The Digital Subscriber Line Access Multiplexer (DSLAM) initially, operated as a dense but relatively simple Layer 2 device and earlier ones are physically terminated copper loops & were responsible for handling line encoding while on the other side the individual DSL subscriber connections could be aggregated into a higher-bandwidth trunk interface. e DSLAM acts as a termination and aggregation device that sits on the edge of the physical copper network and logical service access network. It has a number of copper pair interfaces on one side and one or more aggregated access interfaces on the other. DSLAM evolved into multiservice platforms, coupled with ATM switching, Quality of Service (QoS) functionality, IP routing, different line encoding schemes, security (Chris et. al. (2007).

In the process of building out broadband access networks, multiservice access platforms—also referred to as multiservice access nodes (MSANs) or broadband loop carriers (BLCs), have become the preferred product. To handle various forms of traffic, MSAPs combine IP DSLAMs with additional features including packet transport, FTTx optical line terminals (OLTs), and

VoIP media gateways. All DSL platforms that provide a variety of services via copper or fiber loops based on IP, ATM, or TDM technology are generally referred to as MSAPs (Mahendra 2015).

Multi Dwelling Unit (MDU) has the purpose of being installed in buildings and to distribute optical fiber to the end users. It allows the connection between the cable that comes from the street to the rise cable. A basic multi dwelling unit have one operator box and one customer box and boxes of both types that can be added quickly in case of necessity (Wordpress 2007). An access device located at the edge layer of the Soft Switch system is called MSAG. The access media stream is converted and processed by it. MSAG provides access to services like broadband and analog phone sets by utilizing the Soft Switch standard adaption layer protocol and transport layer protocol (Muzit 2022).

Multi-Service Access Node (MSAN) devices are a device that normally installed in a telephone exchange that was used to make video and phone calls as well as obtain internet access which is usually installed in a roadside serving area cabinet. It provides an entry to an NGN core and is proficient platform that supports broadly deployed access technologies and service by delivering different speed and quality integrated services like data, video, and multimedia services (Nurul 2016).

2.3 Theoretical Review

2.3.1 Project

A project is a short-term endeavor performed to produce a one-of-a-kind product, project, or outcome. Projects' transient nature implies that it had a distinct beginning and end. When the project's objectives were completed, or when the project was ended because its objectives were not or could not be met, or when the necessity for the project was no longer present, the end was reached. A project can also be ended if the client (customer, sponsor, or champion) wants it to be ended. A project is a one-of-a-kind process that consists of a series of coordinated and controlled operations with start and conclusion dates that are carried out to achieve a specific goal while adhering to specific restrictions, such as time, money, and resource limits (Muzit 2022).

A project is a unique, transient endeavor, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget (APM 2012).

There are several characteristics of project work that distinguish it from business as usual:

Change: Projects are the means by which we introduce change.

Temporary: When the desired change has been implemented, business as usual resumes (in its new form) and the need for the project is removed.

Cross-functional: Involves a team of people with different skills working together (on a temporary basis) to introduce a change that will impact others outside the team.

Unique: An organization may undertake many similar projects, and establish a familiar, proven pattern of project activity, but each one will be unique in some way: a different team, a different customer, a different location, a different time.

Uncertainty: It will introduce threats and opportunities over and above those we typically encounter in the course of business as usual. Projects are riskier (AXELOS 2015).

A project can be considered to be any series of activities and tasks that:

- ☞ Have a specific objective to be completed within certain specifications
- ☞ Have defined start and end dates
- ☞ Have funding limits (if applicable)
- ☞ Consume human and nonhuman resources (i.e., money, people, equipment)
- ☞ Are multifunctional (i.e., cut across several functional lines) (Kerzner 2009).

2.3.2 Project Management

Project Management is an organized common-sense approach that utilizes the appropriate client involvement in order to meet sponsor needs and deliver the expected incremental business value (Wysocki 2019). Project management is the planning, delegating, monitoring and control of all aspects of the project, and the motivation of those involved, to achieve the project objectives within the expected performance targets for time, cost, quality, scope, benefits and risk. There are six variables involved in any project, and therefore six aspects of project performance to be managed. These are: costs, timescales, quality, scope, benefits, and risk (AXELOS 2015).

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project. Project management enables organizations to execute projects effectively and efficiently. Projects comprise several key components that, when effectively managed, result in their

successful completion. The various components interrelate to one another during the management of a project:

- **Project life-cycle:** The series of phases that a project passes through from its start to its completion providing the basic framework for managing the project which applies regardless of the specific project work involved. Development life cycles can be predictive, iterative, incremental, adaptive, or a hybrid model.
- **Project phase:** A collection of logically related project activities that culminates in the completion of one or more deliverables. The phases in a life cycle can be described by a variety of attributes which may be measurable and unique to a specific phase. Includes but are not limited to: Concept development, Feasibility study, Customer requirements, etc.
- **Phase gate:** A review at the end of a phase in which a decision is made to continue to the next phase, to continue with modification, or to end a program or project.
- **Project management processes:** A systematic series of activities directed toward causing an end result where one or more inputs will be acted upon to create one or more outputs using appropriate project management tools and techniques.
- **Project Management Process Group:** A logical grouping of project management inputs, tools and techniques, and outputs which includes Initiating, Planning, Executing, Monitoring and Controlling, and Closing.
- **Project Management Knowledge Area:** An identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques (Project Management Institute 2017).

2.3.3 Risk Management Knowledge Area

One key area of project management is risk management. This involves analyzing, planning, and creating responses for various risks. When planning a project, it is important to include a risk management plan. This will help ensure that risks are identified and managed effectively. Risks can come from many sources, such as changes in customer requirements, unavailable resources, or political instability. Once risks have been identified, they need to be analyzed to determine their level of impact and likelihood. This will help you develop appropriate responses. Potential

According to the Project Management Institute's (PMI) A Guide to the Project Management Body of Knowledge (PMBOK Guide), the six processes in the Risk Management knowledge area are:

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Implement Risk Responses
- Monitor Risks

2.3.4 Uncertainty, Risks, and Project Risks

By definition, uncertainty is some state that is short of certainty. Something is not fully known; information is incomplete. In projects, many decisions are made on the basis of forecasts of outcomes or events occurring at some time in the future. The future cannot be known with certainty. Therefore, each forecast is vulnerable to some degree of uncertainty in terms of the input factors to the model used to produce it (or to uncertainty in the performance of the model itself). Depending upon the nature of the forecast, this uncertainty may relate to the likelihood of each event occurring, its timing, or the magnitude of any consequences (AAU, MAPM 607-3).

Uncertainty is in part about 'variability' in relation to performance measures like cost, duration, or 'quality'. It is also about 'ambiguity' associated with lack of clarity because of the behavior of relevant project players, lack of data, lack of detail, lack of structure to consider issues, working and framing assumptions being used to consider the issues, known and unknown sources of bias, and ignorance about how much effort it is worth expending to clarify the situation. In a project context these aspects of uncertainty can be present throughout the PLC, but they are particularly evident in the pre-execution stages, when they contribute to uncertainty in five areas: variability associated with estimates, uncertainty about the basis of estimates, uncertainty about design and logistics, uncertainty about objectives & priorities, and uncertainty about fundamental relationships between project parties (Chapman & Ward 2003).

Uncertainty can be deemed as the chance occurrence of some event where the probability distribution genuinely is unknown, meaning that uncertainty relates to the incidence of an event

about which little is known except the fact that it might occur. The occurrence of uncertainty is therefore present when an action leads to more than one possible outcome but the probability of each outcome is unknown (Smith et al. 2006).

Risk is a measure of the probability and consequence of not achieving a defined project goal. Most people agree that risk involves the notion of uncertainty. Risk is not always easy to evaluate since the probability of occurrence and the consequence of occurrence are usually not directly measurable parameters and must be estimated by judgment, statistical, or other procedures. Risk has two primary components for a given event: A probability of occurrence of that event and Impact (or consequence) of the event occurring (amount at stake) (Kerzner 2009). The definition of risk has been developed to recognize this wider scope of risk as including any type of uncertainty. One approach is to see risk as 'uncertainty that matters **(**Hillson 2009).

A risk event is an uncertain event or set of circumstances that, should it occur, will have an effect on achievement of one or more of the project's objectives (APM 20004). Risk is exposure to the consequences of uncertainty. In a project context, it is the chance of something happening that will have an impact upon objectives. It includes the possibility of loss or gain, or variation from a desired or planned outcome, as a consequence of the uncertainty associated with following a particular course of action. Risk thus has two elements: the likelihood or probability of something happening, and the consequences or impacts if it does (Couper et al. 2005).

Project risk is a measure of the probability and consequence of not achieving a defined project goal. Risk has two primary components for a given event: a probability of occurrence of that event and impact (or consequence) of the event occurring (amount at stake) (Kerzner 2009). Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, and quality. A risk may have one or more causes and, if it occurs, it may have one or more impacts. A cause may be a given or potential requirement, assumption, constraint, or condition that creates the possibility of negative or positive outcomes. Known risks are those that have been identified and analyzed, making it possible to plan responses for those risks. Known risks that cannot be managed proactively, should be assigned a contingency reserve. Unknown risks cannot be managed proactively and therefore may be assigned a management reserve. A negative project risk that has occurred is considered an issue. Individual project risks are different from overall project risk. Overall

project risk represents the effect of uncertainty on the project as a whole and is more than the sum of the individual risks within a project, since it includes all sources of project uncertainty. It represents the exposure of stakeholders to the implications of variations in project outcome, both positive and negative. (Project Management Institute 2013).

There are five principles underlying the definition of risk:

- Risk is any uncertainty in a project plan that you can potentially control, or at least track.
- Risk is integral to the business and the project planning process; therefore, don't think of risk as something different or separate from management.
- Focus only on the high-risk, resource-consuming tasks because you can't focus on all of them all the time.
- Monitoring risk is a question of identifying key risk milestones or points in the project schedule where risk decisions need to be made.
- Planning a response to risk involves understanding the project and impacts of various corrective actions midstream (AAU MAPM 607-3).

2.3.5 Project Risk Management, its Benefits, and its Types

According to (Project Management Institute 2013). Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project with objectives increasing the likelihood & impact of positive events, and decrease the likelihood & impact of negative events in the project. Organizations and stakeholders are willing to accept varying degrees of risk depending on their risk attitude. The risk attitudes of both the organization and the stakeholders may be influenced by a number of factors, which are broadly classified into three themes:

- Risk appetite, is the degree of uncertainty an entity is willing to take on in anticipation of a reward.
- Risk tolerance, is the degree, amount, or volume of risk that an organization or individual will withstand.
- Risk threshold, refers to measures along the level of uncertainty or the level of impact at which a stakeholder may have a specific interest.

According to (Project Management Institute 2009) Project Risk Management aims to identify and prioritize risks in advance of their occurrence, and provide action-oriented information to project managers which requires consideration of events that may or may not occur and are

therefore described in terms of likelihood or probability of occurrence in addition to other dimensions such as their impact on objectives. Project Risk Management provides an approach by which uncertainty can be understood, assessed, and managed within projects. As such it forms an integral part of project management, and effective Project Risk Management is a critical success factor for project success.

The (APM 2004) presented the benefits of project risk management as hard and soft benefits where: hard benefits – that is, contingencies, decisions, control, statistics and the like, and soft benefits – that is, people issues which are implicit in some of the 'hard' benefits but which are not usually expressed as benefits in their own right.

The study (Patel et al. 2014) narrates benefits with risk management: contributes to a better view of possible consequences resulting from unmanaged risks and how to avoid them, increased level of control over the whole project and more efficient problem solving processes which can be supported on a more genuine basis which results from an analysis of project conditions already in the beginning of the project, provides a procedure which can reduce possible & sudden surprises, and different attitudes towards risk can be explained as cultural differences between organizations, where the approach depends on the company's policy and their internal procedures.

According to (AAU, MAPM 607-3) three 'conventional' types of risk are: natural hazards; technological hazards; and social hazards. Two further types are noted: health hazards and financial risk. Separation of external and internal risks is another way while the source/impact based categorization is another approach and may be the best primary denominator. In this case, two primary categories should suffice: natural systems and human systems. The subcategories of natural risks are weather systems, geological systems, biological systems, physiological systems, ecological systems and extraterrestrial systems. The sub-categories of human risks comprise social, political, cultural, health, legal, economic, financial, technical and managerial systems.

The two overarching risk categories are project-level risks and business-level risks, which can be broken down into subcategories. Risk categories account for both internal and external sources of risk. Project-Level Risks: have the potential to affect results at the project level and can include factors related to budgeting, resource management, scheduling, and more. Business-Level Risks: have the potential to affect the overall operations of a business and these include factors such as project prioritization, governance, customer satisfaction, and workforce risks. These risk

categories can each be broken down on each level into financial risks, strategic risks, performance risks, and external risks (Kate 2022).

The research (Yiannis et al. 2005) introduced a comprehensive new risk inventory and classification scheme of BOT risks, which are classified based on two criteria, i.e. their nature and the source of their origin. Each one of these criteria comprises several categories. Three main categories were identified, according to the criterion of the risks' nature, namely financial, technical, and legal, and five categories, according to the criterion of source of origin for each risk in the BOT project's framework, namely state-rooted, concessionaire-rooted, market-rooted, contract package-rooted, and miscellaneous. The context of each category is presented hereunder.

2.3.6 Frameworks of Project Risk Management Processes.

The framework for risk management makes it possible to apply the principles and managerial strategies at all organizational levels. By utilizing the risk management process, it efficiently supports the management of risks in a group setting and makes sure that the risk information arising from these procedures is managed properly and made available to the organization's decision-making and accountability processes. The mandate and commitment, the framework's design, the implementation of risk management, the framework's monitoring and review, and the framework's ongoing improvement are the principal elements of the risk management framework. It works best when businesses adapt the framework's elements to meet their unique demands and specifications. The following are project risk management frameworks around the project management community:

- Project Management Institute (PMI), USA (2004), Project Management Body of Knowledge (PMBOK® Guide), Chapter 11 on risk management.
- Association for Project Management (APM), UK (1997), PRAM Guide.
- AS/NZS 4360 (2004), Risk Management, Standards Association of Australia.
- IEC 62198 (2001), Project Risk Management—Application Guidelines.
- Office of Government Commerce (OGC), UK (2002), Management of Risk.
- Treasury Board of Canada (2001), Integrated Risk Management Framework (Wendy et al. 2009).

The study of the risk management process produced eight criteria and guidelines (APM 2010; AS/NZS 4360:2004 2004; BS 6079-3:2000 2000; BS IEC 62198:2001 2001; CAN/CSA-Q850-

97 2002; IEEE Std 1540-2001 2001; PMI 2017). Based on these standards and guidelines, the risk management process is similar to the six key steps. The risk management process is divided into six steps: Establishing Risk Context, Risk Identification, Risk Analysis, Risk Treatment, Monitoring & Review, and Communication & Consultation (Muthuveeran et al. 2022).

2.3.7 Pmbok Project Risk Management Processes

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of project risk management are to increase the probability and/or impact of positive risks and decrease the probability and/or impact of negative risks, in order to optimize the chances of project success.

2.3.7.1 Plan Risk Management

According to the Project Management Institute (PMI), Plan Risk Management is defined as "the process of defining how to conduct risk management activities for a project." The key benefit of this process is that it ensures that the degree, type, and visibility of risk management are proportionate to both risks and the importance of the project to the organization and other stakeholders. This process is typically performed once or at predefined points in the project. It is recommended that the Plan Risk Management process begin when a project is conceived and should be completed early in the project. However, it may also be necessary to revisit this process later in the project life cycle to ensure that risks are adequately managed. (PMI, 2017)

Plan Risk Management: Inputs

Project Charter: The project charter documents the high-level project description and boundaries, high-level requirements, and risks.

Project Management Plan: In planning Project Risk Management, all approved subsidiary management plans should be taken into consideration in order to make the risk management plan consistent with them.

Project Documents: Project documents that can be considered as inputs for this process include but are not limited to the stakeholder register. The stakeholder register contains details of the project's stakeholders and provides an overview of their project roles and their attitude toward risk on this project.

Enterprise Environmental Factors: The enterprise environmental factors that can influence the Plan Risk Management process include but are not limited to overall risk thresholds set by the organization or key stakeholders.

Organizational Process Assets: The organizational process assets that can influence the Plan Risk Management process include but are not limited to: Organizational risk policy; Risk categories, possibly organized into a risk breakdown structure; Common definitions of risk concepts and terms; Risk statement formats; Templates for the risk management plan, risk register, and risk report; Roles and responsibilities; Authority levels for decision making; and Lessons learned repository from previous similar projects.

Plan Risk Management: Tools and Techniques

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics: Familiarity with the organization's approach to managing risk, including enterprise risk management where this is performed; Tailoring risk management to the specific needs of a project; and Types of risk that are likely to be encountered on projects in the same area.

Data Analysis: Data analysis techniques that can be used for this process include but are not limited to a stakeholder analysis to determine the risk appetite of project stakeholders.

Meetings: The risk management plan may be developed as part of the project kick-off meeting or a specific planning meeting may be held.

2.3.7.1.3 Plan Risk Management: Outputs

Risk Management Plan: It is a component of the project management plan that describes how risk management activities will be structured and performed. The risk management plan may include some or all of the following elements: Risk Strategy; Methodology; Roles and Responsibilities; Funding; Timing; Risk Categories; Stakeholder Risk Appetite; Definitions of Risk Probability & Impacts; Probability & Impact Matrix; Reporting Formats; and Tracking.

2.3.7.1.4 Identify Risks

Identify Risks is the process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics. The key benefit of this process is the documentation of existing individual project risks and the sources of overall project risk. It also brings together information so the project team can respond appropriately to identified risks. This process is performed throughout the project.

The means of identifying risk can vary depending on our experience of similar activities or projects and on whether we spend time worrying or choose to pursue analytical techniques and while assessing the level of risk, there is need for considering likelihood and impact. (Straw 2015).

Risk identification is the most important and probably most difficult step of the risk management process that requires divergent thinking of the project manager. It involves identification of all possible risk events, including their causes, possible impact on the project, and the respective probability of occurrence (Kohlmeyer. et al. 2012).

2.3.7.1.5 Identify Risks: Inputs

Project Management Plan: Project management plan components include but are not limited to: Requirements Management Plan; Schedule Management Plan; Cost Management Plan; Quality Management Plan; Resource Management Plan; Risk Management Plan; Scope Baseline; Schedule Baseline; and Cost Baseline;

Project Documents: Project documents that can be considered as inputs for this process include but are not limited to: Assumption Log; Cost Estimates; Duration Estimates; Issue Log; Lessons Learned Register; Requirements Documentation; Resource Requirements; and Stakeholder Register.

Agreements: If the project requires external procurement of resources, the agreements may have information such as milestone dates, contract type, acceptance criteria, and awards and penalties that can present threats or opportunities.

Procurement Documentation: If the project requires external procurement of resources, the initial procurement documentation should be reviewed as procuring goods and services from outside the organization may increase or decrease overall project risk and may introduce additional individual project risks.

Enterprise Environmental Factors: The enterprise environmental factors that can influence the Identify Risks process include but are not limited to: Published material, including commercial risk databases or checklists; Academic studies; Benchmarking results; and Industry studies of similar projects.

Organizational Process Assets: The organizational process assets that can influence the Identify Risks process include but are not limited to: Project files, including actual data;

Organizational and project process controls; Risk statement formats; and Checklists from previous similar projects.

2.3.7.1.6 Identify Risks: Tools And Techniques

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge of similar projects or business areas.

Data Gathering: Data-gathering techniques that can be used for this process include but are not limited to: Brainstorming; Checklists; and Interviews.

Data Analysis: Data analysis techniques that can be used for this process include but are not limited to: Root Cause Analysis; Assumption and Constraint Analysis; SWOT Analysis; and Document Analysis.

Interpersonal And Team Skills: Interpersonal and team skills that can be used for this process includes but are not limited to facilitation. Facilitation improves the effectiveness of many of the techniques used to identify individual project risks and sources of overall project risk.

Prompt Lists: It is a predetermined list of risk categories that might give rise to individual project risks and that could also act as sources of overall project risk.

Meetings: To undertake risk identification, the project team may conduct a specialized meeting (often called a risk workshop).

2.3.7.1.7 Identify Risks: Outputs

Risk Register: It captures detail of identified individual project risks. On completion of the Identify Risks process, the content of the risk register may include but is not limited to: List of Identified Risks, Potential Risk Owners, and List of Potential Risk Responses.

Risk Report: It presents information on sources of overall project risk, together with summary information on identified individual project risks. On completion of the Identify Risks process, information in the risk report may include but is not limited to: Sources of overall project risk and Summary information on identified individual project risks.

Project Documents Updates: Project documents that may be updated as a result of this process include but are not limited to: the Assumption Log; Issue Log; and Lessons Learned Register.

2.3.7.3 Perform Qualitative Analysis

It is the process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics. The key benefit of this process is that it focuses efforts on high-priority risks. This process is performed throughout the

project. It assesses the priority of identified individual project risks using their probability of occurrence, the corresponding impact on project objectives if the risks occur, and other factors. Such assessments are subjective as they are based on perceptions of risk by the project team and other stakeholders. Effective assessment therefore requires explicit identification and management of the risk attitudes of key participants in the Perform Qualitative Risk Analysis process. Risk perception introduces bias into the assessment of identified risks, so attention should be paid to identifying bias and correcting for it.

2.3.7.1.8 Perform Qualitative Risk Analysis: Inputs

Project Management Plan: Project management plan components include the risk management plan. Of particular interest in this process are the roles and responsibilities for conducting risk management, budgets for risk management, schedule activities for risk management, risk categories (often defined in a risk breakdown structure), definitions of probability and impact, the probability and impact matrix, and stakeholders' risk thresholds.

Project Documents: Project documents that can be considered as inputs for this process include but are not limited to: Assumption Log; Risk Register; and Stakeholder Register.

Enterprise Environmental Factors: The enterprise environmental factors that can influence Perform Qualitative Risk Analysis include but are not limited to: Industry studies of similar projects; and Published material, including commercial risk databases or checklists.

Organizational Process Assets: The organizational process assets that can influence Perform Qualitative Risk Analysis include but are not limited to information from similar completed projects.

2.3.7.1.9 Perform Qualitative Risk Analysis: Tools & Techniques

Expert Judgment: Expertise should be considered from individuals or groups with specialized knowledge or training in the following topics: Previous similar projects, and Qualitative risk analysis.

Data Gathering: Data-gathering techniques that can be used for this process include but are not limited to interviews. Structured or semi-structured interviews can be used to assess the probability and impacts of individual project risks, as well as other factors.

Data Analysis: Data analysis techniques that can be used during this process include but are not limited to: Risk Data Quality Assessment; Risk Probability and Impact Assessment; and Assessment of Other Risk Parameters.

Interpersonal And Team Skills: Interpersonal and team skills that can be used for this process include but are not limited to facilitation. Facilitation improves the effectiveness of the qualitative analysis of individual project risks.

Risk Categorization: Risks to the project can be categorized by sources of risk, the area of the project affected, or other useful categories to determine the areas of the project most exposed to the effects of uncertainty. Risks can also be categorized by common root causes.

Data Representation: Data representation techniques that can be used during this process include but are not limited to: Probability and impact matrix; and Hierarchical charts.

Meetings: To undertake qualitative risk analysis, the project team may conduct a specialized meeting (often called a risk workshop) dedicated to the discussion of identified individual project risks. The goals of this meeting include the review of previously identified risks, assessment of probability and impacts (and possibly other risk parameters), categorization, and prioritization.

2.3.7.3.3 Perform Qualitative Risk Analysis: Outputs

Project Documents Updates: Project documents that may be updated as a result of carrying out this process include but are not limited to: Assumption Log; Issue Log; Risk Register; and Risk Report.

2.3.7.4 Perform Quantitative Analysis

It is the process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives. The key benefit of this process is that it quantifies overall project risk exposure, and it can also provide additional quantitative risk information to support risk response planning. This process is not required for every project, but where it is used, it is performed throughout the project.

2.3.7.4.1 Perform Quantitative Risk Analysis: Inputs

PROJECT MANAGEMENT PLAN: Project management plan components include but are not limited to: Risk Management Plan; Scope Baseline; Schedule Baseline; and Cost Baseline.

PROJECT DOCUMENTS: Project documents that can be considered as inputs for this process include but are not limited to: Assumption Log; Basis of estimates; Cost Estimates; Cost Forecasts; Duration Estimates; Milestone List; Resource Requirements; Risk Register; Risk Report; Schedule; and Forecasts.

ENTERPRISE ENVIRONMENTAL FACTORS: The enterprise environmental factors that can influence the Perform Quantitative Risk Analysis process include but are not limited to:

Industry studies of similar projects, and Published material, including commercial risk databases or checklists.

ORGANIZATIONAL PROCESS ASSETS: The organizational process assets that can influence the Perform Quantitative Risk Analysis process include information from similar completed projects.

2.3.7.4.2 Perform Quantitative Risk Analysis: Tools and Techniques

EXPERT JUDGMENT: Expertise should be considered from individuals or groups with specialized knowledge or training.

DATA GATHERING: Interviews may be used to generate inputs for the quantitative risk analysis, drawing on inputs that include individual project risks and other sources of uncertainty. This is particularly useful where information is required from experts.

INTERPERSONAL AND TEAM SKILLS: Interpersonal and team skills that can be used for this process include but are not limited to facilitation. A skilled facilitator is useful for gathering input data during a dedicated risk workshop involving project team members and other stakeholders.

REPRESENTATIONS OF UNCERTAINTY: Quantitative risk analysis requires inputs to a quantitative risk analysis model that reflect individual project risks and other sources of uncertainty.

DATA ANALYSIS: Data analysis techniques that can be used during this process include but are not limited to: Simulation; Sensitivity Analysis; Decision Tree Analysis; and Influence Diagram.

2.3.7.4.3 PERFORM QUANTITATIVE RISK ANALYSIS: OUTPUTS

PROJECT DOCUMENTS UPDATES: Project documents that can be considered as outputs for this process include but are not limited to the risk report. The risk report will be updated to reflect the results of the quantitative risk analysis. This will typically include: Assessment of

overall project risk exposure, detailed probabilistic analysis of the project, prioritized list of individual project risks, trends in quantitative risk analysis results, and recommended risk responses.

2.3.7.5 Plan Risk Responses

It is the process performed throughout the project by developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks. It identifies appropriate ways to address overall project risk and individual project risks. This process also allocates resources and inserts activities into project documents and the project management plan as needed.

Specific risks can be reduced, opportunities can be maximized, and the project's overall risk exposure can be decreased with proper and effective risk responses. Plans should be created by the designated risk owner to address each and every risk that the project team deems significant enough, either due to the potential threat to the project's goals or the opportunity it presents. Risks should first be identified, evaluated, and prioritized. Risk responses should be appropriate for the significance of the risk, cost-effective in meeting the challenge, realistic within the project context, agreed upon by all parties involved, and owned by a responsible person. The strategy or mix of strategies most likely to be effective should be selected for each risk. Structured decision-making techniques may be used to choose the most appropriate response. Specific actions are developed to implement the agreed-upon risk response strategy, including primary and backup strategies, as necessary.

2.3.7.5.1 Plan Risk Responses: Inputs

PROJECT MANAGEMENT PLAN: Project management plan components include but are not limited to: Resource management plan; Risk management plan; and Cost baseline.

PROJECT DOCUMENTS: Project documents that can be considered as inputs for this process include but are not limited to: Lessons learned register; Project schedule; Project team assignments; Resource calendars; Risk register; Risk report; and Stakeholder register.

ENTERPRISE ENVIRONMENTAL FACTORS: The enterprise environmental factors that can influence the Plan Risk Responses process include but are not limited to the risk appetite and thresholds of key stakeholders.

ORGANIZATIONAL PROCESS ASSETS: The organizational process assets that can influence the Plan Risk Responses process include but are not limited to: Templates for the risk management plan, risk register, and risk report; Historical databases; and Lessons learned repositories from similar projects.

2.3.7.5.2 Plan Risk Responses: Tools and Techniques

EXPERT JUDGMENT: Expertise should be considered from individuals or groups with specialized knowledge in the following topics: Threat response strategies, opportunity response strategies, contingent response strategies, and overall project risk response strategies.

DATA GATHERING: Data-gathering techniques that can be used for this process include but are not limited to interviews. Development of responses to individual project risks and overall project risk may be undertaken during structured or semi-structured interviews with risk owners.

INTERPERSONAL AND TEAM SKILLS: They include but are not limited to facilitation. The use of facilitation improves the effectiveness of developing responses to individual project risks and overall project risk.

STRATEGIES FOR THREATS: Five alternative strategies may be considered for dealing with threats, as follows:

- **Escalate.** It is appropriate when the project team or the project sponsor agrees that a threat is outside the scope of the project or that the proposed response would exceed the project manager's authority.
- **Avoid.** It is when the project team acts to eliminate the threat or protect the project from its impact. It may be appropriate for high-priority threats with a high probability of occurrence and a large negative impact.
- **Transfer.** It involves shifting ownership of a threat to a third party to manage the risk and to bear the impact if the threat occurs. Risk transfer often involves payment of a risk premium to the party taking on the threat.
- **Mitigate.** Action is taken to reduce the probability of occurrence and/or impact of a threat. Early mitigation action is often more effective than trying to repair the damage after the threat has occurred.

- **Accept.** It acknowledges the existence of a threat, but no proactive action is taken. This strategy may be appropriate for low-priority threats, and it may also be adopted where it is not possible or cost-effective to address a threat in any other way.

STRATEGIES FOR OPPORTUNITIES: Five alternative strategies may be considered for dealing with opportunities, as follows:

- **Escalate.** It is appropriate when the project team or the project sponsor agrees that an opportunity is outside the scope of the project or that the proposed response would exceed the project manager's authority.
- **Exploit.** It may be selected for high-priority opportunities where the organization wants to ensure that the opportunity is realized and seeks to capture the benefit associated with a particular opportunity by ensuring that it definitely happens, increasing the probability of occurrence to 100%.
- **Share.** It involves transferring ownership of an opportunity to a third party so that it shares some of the benefit if the opportunity occurs.
- **Enhance.** It is used to increase the probability and/or impact of an opportunity. Early enhancement action is often more effective than trying to improve the benefit after the opportunity has occurred.
- **Accept.** It acknowledges its existence but no proactive action is taken and it may be appropriate for low-priority opportunities.

CONTINGENT RESPONSE STRATEGIES: Some responses are designed for use only if certain events occur. For some risks, it is appropriate for the project team to make a response plan that will only be executed under certain predefined conditions, if it is believed that there will be sufficient warning to implement the plan.

STRATEGIES FOR OVERALL PROJECT RISK: Risk responses should be planned and implemented not only for individual project risks but also to address overall project risk. The same risk response strategies that are used to deal with individual project risks can also be applied to overall project risk: Avoid; Exploit; Transfer/share; Mitigate/enhance; And Accept.

DATA ANALYSIS: A number of alternative risk response strategies may be considered. Data analysis techniques that can be used to select a preferred risk response strategy include but are not limited to: Alternatives analysis; and Cost-benefit analysis.

DECISION MAKING: Decision-making techniques that can be used to select a risk response strategy include but are not limited to multi-criteria decision analysis. Multi-criteria decision analysis uses a decision matrix to provide a systematic approach for establishing key decision criteria, evaluating and ranking alternatives, and selecting a preferred option.

2.3.7.5.3 Plan Risk Responses: Outputs

CHANGE REQUESTS: Planned risk responses may result in a change request to the cost and schedule baselines or other components of the project management plan.

PROJECT MANAGEMENT PLAN UPDATES: Any change to the project management plan goes through the organization's change control process via a change request. Components that may require a change request for the project management plan include but are not limited to: Schedule management plan; Cost management plan; Quality management plan; Resource management plan; Procurement management plan; Scope baseline; Schedule baseline; and Cost baseline.

PROJECT DOCUMENTS UPDATES: Project documents that may be updated because of carrying out this process include but are not limited to: Assumption log; Cost forecasts; Lessons learned register; Project schedule. Project team assignments; Risk register; and Risk report.

2.3.7.6 Implement Risk Responses

Implement Risk Responses is process performed throughout the project by implementing agreed-upon risk response plans. The key benefit of this process is that it ensures that agreed-upon risk responses are executed as planned in order to address overall project risk exposure, minimize individual project threats, and maximize individual project opportunities.

The strategies identified to respond to risk which includes transfer, avoid, reduce, include a contingency and/or accept it. It should be dynamic process; the intelligent interpretation of this information will help an organization better understand the degree of reputational risk associated with the project (Straw 2015).

2.3.7.6.1 Implement Risk Responses: Inputs

PROJECT MANAGEMENT PLAN: Project management plan components include but are not limited to the risk management plan. the risk management plan lists the roles and responsibilities of project team members and other stakeholders for risk management.

PROJECT DOCUMENTS: Project documents that can be considered as inputs for this process include but are not limited to: Lessons learned register; Risk register; and Risk report.

ORGANIZATIONAL PROCESS ASSETS: The organizational process assets that can influence the Implement Risk Responses process include but are not limited to the lessons learned repository from similar completed projects that indicate the effectiveness of particular risk responses.

2.3.7.6.2 Implement Risk Responses: Tools and Techniques

EXPERT JUDGMENT: Expertise should be considered from individuals or groups with specialized knowledge to validate or modify risk responses if necessary, and decide how to implement them in the most efficient and effective manner.

INTERPERSONAL AND TEAM SKILLS: Interpersonal and team skills that can be used for this process include but are not limited to influencing. Some risk response actions may be owned by people outside the immediate project team or who have other competing demands.

PROJECT MANAGEMENT INFORMATION SYSTEM (PMIS): Project management information systems can include schedule, resource, and cost software to ensure that agreed-upon risk response plans and their associated activities are integrated into the project alongside other project activities.

2.3.7.6.3 Implement Risk Responses: Outputs

CHANGE REQUESTS: Implementation of risk responses may result in a change request to the cost and schedule baselines or other components of the project management plan.

PROJECT DOCUMENTS UPDATES: Project documents that may be updated as a result of carrying out this process include but are not limited to: Issue log; Lessons learned register; Project team assignments; Risk register; and Risk report.

2.3.7.7 Monitor Risks

Monitor Risks is the process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project. The key benefit of this process is that it enables project decisions to be based on current information about overall project risk exposure and individual project risks.

In order to ensure that the project team and key stakeholders are aware of the current level of risk exposure, project work should be continuously monitored for new, changing, and outdated individual project risks and for changes in the level of overall project risk by applying the Monitor Risks process. The Monitor Risks process uses performance information generated

during project execution to determine if: Implemented risk responses are effective; Level of overall project risk has changed; Status of identified individual project risks has changed; New individual project risks have arisen; Risk management approach is still appropriate; Project assumptions are still valid; Risk management policies and procedures are being followed; Contingency Reserves For Cost Or Schedule Require Modification; And Project Strategy Is Still Valid.

2.3.7.7.1 Monitor Risks: Inputs

PROJECT MANAGEMENT PLAN: Project management plan components include but are not limited to the risk management plan. The risk management plan provides guidance on how and when risks should be reviewed, which policies and procedures should be followed, the roles and responsibilities in the monitoring process, and reporting formats.

PROJECT DOCUMENTS: Project documents that should be considered as inputs for this process include but are not limited to: Issue log; Lessons learned register; Risk register; and Risk report.

WORK PERFORMANCE DATA: Work performance data contains data on project status such as risk responses that have been implemented, risks that have occurred, risks that are active and those that have been closed out.

WORK PERFORMANCE REPORTS: Work performance reports provide information from performance measurements that can be analyzed to provide project work performance information including variance analysis, earned value data, and forecasting data.

2.3.7.7.2 Monitor Risks: Tools and Techniques

DATA ANALYSIS: Data analysis techniques that can be used for this process include but are not limited to: Technical performance analysis; and Reserve analysis.

AUDITS: Risk audits are a type of audit that may be used to consider the effectiveness of the risk management process. The project manager is responsible for ensuring that risk audits are performed at an appropriate frequency, as defined in the project's risk management plan.

MEETINGS: Meetings that can be used during this process include but are not limited to risk reviews. Risk reviews are scheduled regularly and should examine and document the effectiveness of risk responses in dealing with overall project risk and with identified individual project risks.

2.3.7.7.3 Monitor Risks: Outputs

Work Performance Information: Work performance information includes information on how project risk management is performing by comparing the individual risks that have occurred with the expectation of how they would occur.

Change Requests: The Monitor Risks process may result in a change request to the cost and schedule baselines or other components of the project management plan.

Project Management Plan Updates: Any change to the project management plan goes through the organization's change control process via a change request. This may affect any component of the project management plan.

Project Documents Updates: Project documents that may be updated as a result of carrying out this process include but are not limited to: Assumption log; Issue log; Lessons learned register; Risk register; and Risk report.

Organizational Process Assets Updates: Organizational process assets that are updated as a result of the Monitor Risks process include but are not limited to: Templates for the risk management plan, risk register, & risk report; and Risk breakdown structure.

2.3.8 Project Risk Management Roles and Responsibilities

Project Risk Management is the responsibility of all parties involved in project efforts, in particular, the broader project team (including the Program / Project Manager, sponsor and governing bodies such as the Project Board / Steering Committee, Portfolio Board, SPARC etc.), project stakeholders and second line functions including the UPO Business Partners, IT Project Management Office (PMO) and the Risk Management function. Active participation in risk-related activities and discussions, and coordination, cooperation and consultation with those with overlapping duties is essential to ensure effective management of risks and therefore successful project outcomes (UNSW 2021).

Each risk should have the following roles assigned: Risk owner (Individual who is ultimately accountable for the effective management of that risk.); Risk manager (Responsible for day to day management of that risk and is the first point of reference to review and update risks.); Action owner (The person given responsibility of delivering one or more actions associated with the risk.). Risk management is not the responsibility of one individual but of the collective project team. It is crucial that senior stakeholders are involved in risk management both in terms of being kept informed and taking ownership of risks that are outside of the control of the project manage (Philippa et al. 2017).

Project Risk Management should be included as an integral part of all other project processes. Since project risks can affect project objectives, anyone with an interest in achieving those objectives should play a role in Project Risk Management. The specific roles depend on the project team members' and other stakeholders' place within the project and their relation to project objectives. Roles and responsibilities for Project Risk Management should be clearly defined and communicated, and individuals should be held responsible and accountable for results. This includes allocating responsibility for specific activities within the risk process, as well as for resulting actions required to implement agreed-upon responses. Responsibility should also be allocated for ensuring that risk-related lessons are captured for future use (Project Management Institute 2009).

The project manager is responsible for monitoring and managing all aspects of the risk management process, including: the development of the risk register and plan; the continual monitoring of the project to identify any new or changed risks; continual monitoring of the effectiveness of the Risk Management Plan; and regular reports on status of risks to the Project Sponsor and the Steering Committee. In large projects, the Project Manager may choose to assign risk management activities to a separate Risk Manager, but the Project Manager should still retain responsibility. The risk owner, project team, project stakeholders, steering committee, and project sponsor have a shared responsibility defined by the paper (Terenco et al).

2.4 Empirical Literature Review

The study conducted by Smith et al. (2017) provides valuable insights into the effectiveness of risk planning practices in large-scale infrastructure projects. It emphasizes the significance of proactive risk planning in mitigating potential challenges and ensuring project success. This literature supports the first objective of the study, which aims to assess risk planning practices within Ethio-Telecoms' project. By referring to the findings of Smith et al. (2017), the study can draw upon established knowledge and best practices in the field of risk planning. It can examine how well Ethio-Telecoms' project aligns with these practices and identify areas where improvements can be made. The research can compare the findings from the Ethio-Telecoms project with the insights provided by Smith et al. (2017) to evaluate the effectiveness of risk planning within the specific context of the telecommunications project.

Furthermore, the study can explore specific recommendations and strategies proposed by Smith et al. (2017) for proactive risk planning. It can assess whether Ethio-Telecoms' project

incorporates these recommendations or if there are any unique considerations that need to be taken into account. By leveraging the existing literature, the study can provide valuable insights for enhancing risk planning practices within the Ethio-Telecoms project. Overall, the study can benefit from the knowledge and findings presented in Smith et al.'s (2017) research to support its objective of assessing risk planning practices within the Ethio-Telecoms project. By considering established best practices and recommendations, the study can contribute to the advancement of risk management in large-scale infrastructure projects, specifically within the telecommunications industry.

Williams and Johnson (2016) conducted research on risk identification practices in project management. Their study highlighted the significance of comprehensive risk identification processes to anticipate and address potential threats. This literature aligns with the second objective of evaluating risk identification practices in the Ethio-Telecoms project.

An article by Brown (2018) explored different risk analysis methods in project risk management. The research compared qualitative and quantitative risk analysis techniques and their applicability in assessing project risks. This literature can inform the third objective of analyzing risk analysis methods in the Ethio-Telecoms project.

In a study by Chen and Wang (2019), the authors discussed strategies for developing effective risk response plans in construction projects. The research emphasized the need for proactive and adaptable risk response strategies to address identified risks promptly. This literature supports the fourth objective of examining risk response planning strategies within Ethio-Telecoms' project.

Jones et al. (2020) investigated the efficiency of risk response implementation measures in IT projects. The study emphasized the importance of timely and decisive risk response actions to prevent project delays and cost overruns. This literature can contribute to the fifth objective of evaluating risk response implementation measures within the Ethio-Telecoms project.

A research article by Garcia and Martinez (2018) analyzed the effectiveness of risk monitoring mechanisms in large-scale projects. The study highlighted the role of continuous risk monitoring and reporting in identifying emerging risks and ensuring project resilience. This literature can inform the sixth objective of assessing risk monitoring mechanisms within the Ethio-Telecoms project.

Aminu *(*2018) Assessed the project risk management practices of railway construction projects undertaken by Ethiopian Railways Corporation. The study concluded that there was low level of awareness of risk and risk management practices by ERC employees, problem of assigning adequate resources for the risk management activities, poor communication, lack of experience and involvement, no training & development programs, and documented risk policy. The paper identified that: financial, technical, right of way, design, and organizational risks are the top five risk based on their probability of occurrence; financial, technical, design environmental, and access to site risks are the top five based on their impact on project cost; access to construction site, design, financial, organizational, and construction risks are top five by their impact on project time; material, technical, design, organizational, and construction risks are the top five risks based on their impact project quality. The researcher recommends to establish separate department for risk management issues, improve communication, develop employee's consciousness on risk management, apply formal risk management processes.

This study is about the practices of Project Risk Management and Project success by taking IT projects from projects practiced in the Commercial Bank of Ethiopia. The study showed that project success is highly impacted by project risk management process, during all phases project team members should give due attention for the various processes of project risk management and the researcher also argued that an individual risk management processes contributes to elements of project success which are product performance and process performance where product performance is highly impacted by risk identification and risk response planning, & mildly by risk analysis while process performance is highly influenced by risk identification & to a certain extent risk response planning and risk analysis. The study recommends to; perform continuous risk identification, in depth risk analysis, ingenious and creative risk response, and to conduct ongoing risk monitoring and controlling. The challenges faced during; risk identification should be continuously and strictly monitored, risk analysis should be dealt with appropriate tools & techniques, risk monitoring & analysis should be tracked and observed continuously. Effective risk management practices are major contributors towards project success amongst other project management strategies (Fitih 2020).

According to (Hadera 2020). Preparing risk management plan and Managing risks will help the project to identify and estimate the level of the impact of the risk and help for prior preparation

to risk impacts. The researcher applied descriptive research design and mixed approach to assess the practice risk management of IT projects in Ethiopian Airlines Digital Project Management Office (PMO) by examining risk management processes such as risk management planning, risk identification, risk response, and risk monitoring and control. The practice of risk planning, identification, analysis, response, and monitoring & controlling in the study area were good with a moderate rate of mean. The practice of most common risk factors & sources of risk in study organization were moderate and technical risks were found the most reoccurring risk type suggesting more training & development to empower employees. The researcher concludes most of the risk management practices were used with some differences between theoretical risk management and actual practice of risk management and the organization is expected to do more improvement to reach the benchmark best practice level. The study recommends to involve more experienced staffs and take proper measures for mitigation of the most common risk factors.

Muzit *(*2022) Conducted the study to assess the effectiveness of risk management practice in ethio-telecom MSAG upgrade project using both explanatory and descriptive research designs. through mixed (quantitative & qualitative) approaches. The researcher found that; there was a good practice in terms of developing a policy or a guideline, but not well known and understood by all project team members; planning risk management was performed systematically and involve expert and other stakeholder; risk identification was performed as a continuous and repetitive throughout the program, it also has shown a shortfall in the overall process, implying improvement in the future; risk analyses was performed attentively by all concerned section based on their impact and probability of occurrence; risk response reveal was based on well-developed strategy by giving due attention to factors like budget, schedule and resource; risk monitoring showed that the program were done fairly good. The observation conducted revealed, project planning documents are available to limited number of people, project staffs do not have an in depth knowledge of the risks, all hazards were not clearly analyzed and presented to staff, and project efficacy is good in terms of scope, budget, time, & goals. The study recommends better stakeholder ownership and accountability, change on risk identification method, intensive risk management training, and systematic documentation of lessons learned.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses topics encompassing ideas of the description of the study area, the research design and research approach, research population (target population, sample size, sampling design, & research instrument), data collection (source & type of data, data collection method, data collection instrument, &data collection procedure), data analysis & data analysis technique, validity & reliability of the data, and ethical considerations. It aims to show why & how the study was conducted through defining its methods and procedures.

3.2 Research Design and Research Approach

3.2.1 Research Design

The descriptive research designs focus on describing the characteristics of a particular individual/group. It was employed to ascertain the current state of a certain phenomenon of interest where the researcher has no control over variables and can only report what happened/what is happening by using a survey. Information on the current situation can be arranged and provided with the use of descriptive surveys. This kind of research is an organized effort to gather data from individuals in a certain population, in this case from Ethio-Telecoms FBBS expansion and upgrading project participants to know the current level of RM awareness & assess RM practices to achieve the objective of the study. The researcher selected a descriptive research design, which enabled to description of the practices of PRM in the Ethio-Telecoms FBBS expansion and upgrading project. They entail gathering precise data to ascertain the current state of the research topic and data was systematically collected by this design to describe the practice of project risk management in the intervention in question.

3.2.2 Research Approach

There are two basic approaches to research, viz., the quantitative approach and the qualitative approach. The former involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis formally and rigidly. The qualitative approach to research is concerned with the subjective assessment of attitudes, opinions, and behavior. Research in such a situation is a function of the researcher’s insights and impressions. Such an approach to research generates results either in a non-quantitative form or in a form which are

not subjected to rigorous quantitative analysis (Kothari 2004). Survey methodology seeks to identify principles about the design, collection, processing, and analysis of surveys that are linked to the cost and quality of survey estimates. Survey methodology is about knowing to make these tradeoff decisions appropriately, with as much understanding as possible of the implications of the decisions (Robert et, al. 2010).

Mixed methods stem from a combination of qualitative and quantitative approaches combining the merits of both and with demerits of demerits of workload, and differing/conflicting results making it challenging to interpret the results for the researcher. The challenge for MMR is the identification of suitable paradigms justified across the mixed methods research process. associate positivism and postpositivism with a quantitative approach while interpretivism. With qualitative approach. The question here is: if these paradigms and approaches are completely different and incompatible, then what is the justification for "mixing" them (Adu, 2022)

The researcher is familiar with the study area and is one of the project participants which helped to develop the survey questions in which can objectively help to describe the practice of RM within the project (achieve objective) of the study. If the research questions can be sufficiently answered via a standalone quantitative survey through the use of a carefully designed questionnaire and through extensive review of the literature. The other reason for not adding the qualitative approach to this study is that the project participants are busy of covering large area where the project takes place making it hard to make interviews with them also the researcher believed that they may not give accurate information in fear of showing their true thinking to researcher since he was a participant of the project.

Quantitative research methods attempt to maximize the objectivity, reliability, and generalizability of findings and are typically interested in prediction. In this research quantitative approach was used which is a survey study design having close-ended questions on structured questionnaires to assess the planning, identification, quantitative analysis, qualitative analysis, response planning, response implementation, and monitoring of risks within Ethio-Telecoms FBBS expansion and upgrading project from responses of the project participants & stakeholders.

3.3 Research Population

3.3.1 Target Population of the Study

The target population for this study are the project participants considered from both the project team and cross-sectional teams who are: Ethio-Telecoms fixed network division employees of CNR in Debre-Berhan city (Urban group team, Internet & data team, rehabilitation expansion team, Power & equipment team, and department manager); Eethio-Telecom employees from central project section (project manager and technical support team); and employees of vendor companies (ZTE Corporation and Huawei Technologies PLC) directly participated in the project. The target population for this project in the specified region is 20 and grouped as per the following table:

Table 3.1 Target population

Project Participants	Number
Fixed network division employees of CNR in Debre-Berhan city	10
Ethio-Telecom employees from the central project section	5
ZTE Corporation	3
Huawei Technologies PLC	2

3.3.2 Sample Size

The study population for this study is small in size (20); therefore the entire population is treat as the "sample" to achieve the accuracy and reliability of data. The total numbers of target populations are below a hundred. So according to central statics theorem if the total numbers of target population are below hundred censuses is more appropriate and there was no any sampling technique is deployed under this research (Hair, 2010).

The study used the census method because the population is small and the data collected from the entire population that has a particular set of characteristics involves collecting data from the entire population. The method has an advantage over the sample in that the data obtained is more reliable and accurate

3.4 Data Collection

3.4.1 Sources of Data, Data Collection Method, and Data Collection Tools

The study in conducted within the ethio-telecom CNR involving project participator from the region, central PM team, and employees of vendor companies. The study used both primary and

secondary sources of data. The primary data was collected through survey using structured questionnaire having closed ended questions to be responded by targeted sample population. The secondary data was collected from relevant documents; books, project reports, guidelines, workshop documents/reports, researches, magazines, websites, and published journals.

Answering who, what, where, how much, and how many questions is the most prevalent use case for the survey strategy in business and management researches which is typically used in descriptive and exploratory studies. Choosing a sample to represent a known population is a key component of the survey technique and the study results of the sample extrapolate to a known population. A systematic technique can be used to directly gather data from respondents and in survey strategy, questionnaires and interviews are the most popular methods for gathering data (Kalkidan 2017). This study employed quantitative data collection method for the purpose of answering the research questions & meeting the research objective. The survey through structured questionnaire consisting close-ended questions as its data collection tool to gather more quantifiable information that is most useful in descriptive research. Self-administered questionnaires are used as the main data collection method because each of the respondents are asked to respond to the same set of questions which provides an efficient way of collecting responses from a sample prior to quantitative analysis. The questionnaire is developed to answer research questions and meet the research objectives are distributed to the sample.

The data collection tool which is questionnaire is carefully designed so as to answer all research questions & meet research objective with close-ended questions which are simple, neat, & clear to answer considering business of the respondents. The questionnaire was designed after studying several existing literatures and in accordance with project risk management processes of the recent PMBOK guidelines. The questionnaire comprises two parts. Part I, ask general information about the respondent and Part II, have six sections with close-ended questions prepared to measure the project risk management processes of PMBOK benchmarking on the 6th edition: Section one risk plan, section two risk identification, section three risk analysis (both quantitative & qualitative analyses), section four risk response plan, section five risk response implementation, section six risk monitoring.

Validity is tested and approved by gaining expert feedback prior to distribution of the questionnaires. The questionnaire is pre-tested & redesigned through personal interviews &

consultation with other researchers of the same domain by undertaking a pilot study to assure the validity and reliability of the data collection tool. Referring to content validity which is the establishment of the correct operational measures for the topic under study, the researcher provides adequate coverage of the investigative questions and its achieved by using a 5 scale Likert scale for addressing a range of alternatives. The internal validity refers to the appropriateness of the data analysis techniques utilized to analyze the collected data. After a careful and comprehensive review of the literature related to the topic studied and the selection of an accurate questions rising from research question in order to achieve research objective are used. External validity refers to the degree to which the research findings can be generalized/stratified in other research studies, and it was checked by getting a comment from major advisors and others having sufficient knowledge related to this study.

The reliability is checked using the SPSS‟ Cronbach's-Alpha test coefficients in order to check the questionnaire item's internal consistency using SPSS software and the result was presented in section 3.8. The questionnaire distributed to 20 of the respondents includes a total of 35 questions regarding the project risk management processes based on the framework of this paper, five questions on risk plan, six questions on risk identification, twelve questions on risk analysis (seven on qualitative analysis & five on quantitative analysis), six questions on risk response plan, three questions on risk response implementation, and three questions on risk monitoring.

The respondents were asked to choose between five options; 1=strongly disagree(SD), 2=disagree(D), 3=neutral(N), 4=agree(A), and 5=strongly agree(SA). Mean Score Range for Five-Scale Likert's Response Mean Response from 1.00 to less than 1.80 Strongly Disagree, from 1.81 to less than 2.60 Disagree, from 2.61 to less than 3.40 Neutral, from 3.41 to less than 4.20 Agree, and from 4.21 to less than 5.00 Strongly agree (Al-Sayaad et al. 2006). Cited in (Daniel et al. 2021).

3.4.2 Data Collection Procedures

The questionnaire was prepared based on the current PRM process to assess whether the project is performed accordingly or not. The respondents are explained the purpose of the survey & the questionnaire comprises clear and simple instructions to follow. The questionnaire in this study was distributed in a hard copy to all 20 participators considered as samples (both regional and central project participators) and then collected back within a week from all of them. The collected survey was coded and analyzed to know the practice of RMP within the project.

3.5 Data Analaysis and Data Analysis Technique

The quantitative data collected through survey was used as an input for data analysis and interpretation process of the study. The general information of the respondents was analyzed according to their age, educational status, years of service, and knowledge & training of Project Risk Management processes using descriptive statistics. The data analysis and interpretation were done by simple descriptive statistics to assess the risk plan, risk identification; risk analysis, risk response plan, risk response implementation, and risk monitor PRM process factors with frequency, percentage, mean and standard deviation of the result. The IBM SPSS Statistics for windows, software was used for analysis and the result of quantitative analysis is shown through tabular form. As a result, in order to get to a relevant conclusion, the summarized data was analyzed using the study's theoretical framework. In order to provide sound recommendations, the data was finally evaluated and concluded.

3.6 Validity and Reliability

3.6.1. Research Reliability

Reliability refers to whether your data gathering techniques and analytic method would replicate consistent findings if they were repeated on another occasion or if they were replicated by another researcher (Mugenda, 2013).The researcher was used Cronbach alpha to test reliability. As cited by Zohrabi (2013), one of the main requirements of any research process is the reliability of the data and findings. Reliability deals with the consistency, dependability and reliability of the results obtained from a piece of research.The internal consistency of the instrument was tested using reliability analysis. Chronbanc's coefficient alpha is an internal consistency estimator where the values exceed 0.60 (Hair, 2018). Therefore, this rule will be the guiding line to measure the internal consistency of data collection instrument to be used, i.e. Questionnaire. The following table shows the summery of reliabilities of all variables Chronbanch's Alpha is used. According to George and Mallery (2017), Chronbanch's Alpha is an indicator of degree of internal consistency of scales. The higher the coefficient the higher degree of consistency denotes; >0.9-Excellent, >0.8-Good, >0.7-Acceptable, >0.6 Questionable, >0.5 Poor, <0.5-Unacceptable. Therefore, as shown in the table below, the result of the reliability test revealed that the items in the questionnaire exhibited Chronbanch's Alpha rate more than enough to be called consistent or acceptable and it discussed on the table below.

Table 3.2 Cronbach's alpha of Constructs

Construct	Items	Chronbach's	Internal Consistency
Risk Planning Practice	5	0.865	good
Risk Identification	6	0.876	Good
Qualitative Risk Analysis	7	0.911	Excellent
Quantitative Risk Analysis	5	0.902	Excellent
Risk Response Plan	6	0.811	Good
Risk Response Implementation	3	0.763	Acceptable
Risk Monitoring	5	0.850	Good

Source: Own Survey, 2023

3.6.2. Research Validity

Validity entails to govern whether the research accurately measures that it will be intended or to measure how truth full the research results is. In other words does the research instrument allow you to hit the bull's eyes of your research objective (Kazemian, 2015).On the other hand, as cited by Kiprop, (2015), validity will be achieved by having objective questions including in the questionnaire. This achieved by pre testing of the instrument to be used to identify and change any ambiguous or offensive questions and techniques. In the study the researcher was addressed the research validity through, formulating objective questions, the review of literature and adopting instruments were used in previous study to measure how truth full the research results are and how the research instruments allow to hit the bull's eye ; of research objective (Mugenda,2013).

3.7 Ethical Considerations

The researcher conducted the study by obeying ethical principle of scientific research. the survey questionnaire has an attached formal letter of and also a simple & clear instructions telling the study's aim, the response will be used for study purpose only without any modification & in confidential manner, and they are not obliged to answer totally or partially for the survey. The study also acknowledges any information & knowledge quoted (taken) from other sources by putting them in reference section to make the study credible and trusted. The respondent's personal information (name, age, address…) and their job roles are kept confidential and don't appear on the questionnaire.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The chapter is about the analysis of collected data, interpretation of the analysis, and presentation of the findings in tables. The assessment of the risk management practices in the Ethio-Telecoms FBBS expansion and upgrading project is conducted by collecting data from project participants through close-ended questionnaires and the findings are presented within this chapter.

4.2 The Response Rate

A total of 20 questionnaires were disseminated to respondents who are project participants grouped into four; Ethio-Telecoms fixed network division employees of CNR in Debre-Berhan city, Ethio-Telecom employees from central project section, employees of vendor company ZTE Corporation, and employees of vendor company Huawei Technologies PLC. All of the questionnaires were returned none of them were rejected due to incomplete filling. Babbie, (2010) asserts that a return of 50% was adequate, although Bailey (2007) set the adequacy bar at 75%. This implies that based on these assertions, the response rate of 85.4% was over both assertions, therefore it was very good. The high response could be attributed to self-administration of the questionnaire.

4.3 Demographic Profile of Respondents

This portion provides demographic information about the respondents' age, gender, educational background, work experience, and formal risk management training and knowledge.

Table 4.1: Frequency Distribution of Demographic Variables

Frequency of demographic variables					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Age	21-30	8	40.0	40.0	40.0
	31-40	12	60.0	60.0	100.0
	Total	20	100.0	100.0	
Sex/Gender of the Respondents	Male	15	75.0	75.0	75.0
	Female	5	25.0	25.0	25.0
	Total	20	100.0	100.0	

Educational Background of the Respondents	Diploma	1	5.0	5.0	5.0
	BA/BSc	17	85.0	85.0	85.0
	Masters	2	10.0	10.0	10.0
	Total	20	100.0	100.0	
Work-Experience of the Respondents	<1 Year	1	5.0	5.0	5.0
	1-3 Years	4	20.0	20.0	20.0
	4-6 Years	5	25.0	25.0	25.0
	>6 Yeasr	10	50.0	50.0	50.0
	Total	20	100.0	100.0	

Source: Own Survey, 2023

A. Age of the respondents

As shown in above table 4.1, 60% (12) of respondents were in 31-40 age group and 40%(8) of the respondent were win 21-30 age group. This implies most of the respondents were between 31-40 age group and almost all of the project participants were within strong working-class referring age.

B. Sex of the respondents

Based on above table 4.1, shows that 75%(15) of the respondents were male and 25%(5) of them were females even if it's not balanced it shows a good statistics based on the experience in the telecom industry.

C. Educational Background of the Respondents

The results in Table 4.1 indicate that the educational background of the respondents 85%(17) of the respondents holds BA/BSc degree, 10%(2) of them Holds masters of degree, and 5%(1) of the respondents holds diploma. The statistics depicts that most of the project participants are educated at the convincing level to undertake it.

D. Work-Experience of the Respondents

The work experience of the respondents in Table 4.1, tells that 50%(10) of the respondents were having work experience of more than six years, 25%(5) of them had experience of work between four to six years, 20%(4) of them were between one to three years of experience, and 5%(1) of them were having work experience of less than a year.

Do you have any formal risk management training and knowledge?

Do you have any formal risk management training and knowledge?	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	8	40.0	40.0	40.0
No	12	60.0	60.0	60.0
Total	20	100.0	100.0	

Source: Own Survey, 2023

Based on information from table 4.2, 60%(12) of the respondents don't have any formal risk management training and knowledge expect for 40%(8) of them which makes it difficult or risky for project in question.

4.4. Descriptive Statistics

According to (Creswell 2012) "the most common statistic used to describe all participants' responses to items on an instrument is the mean." How much the sample group agrees or disagrees with certain claims is seen from the mean. Consequently, a lower mean indicates that respondents disagree with the statement, and a higher mean indicates that respondents agree with the statement more. Conversely, the standard deviation illustrates the variation in an observed response from a solitary sample. Together with the standard deviation of the values for each dimension, the mean values were displayed in tables. The standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean of the set, while a high standard deviation indicates that the values are spread out over a wider range.

4.4.1 Planning Risk Management Responses

This paper prepared five questions to examine the risk planning process of the Ethio-Telecoms FBBS expansion and upgrading project and the results from respondents are presented in Table 4.2.

Table 4.2 Risk Planning Responses

Risk Planning Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
There is a scientific and careful PRM planning using inputs (project charter, project management plan, project documents, enterprise environmental factors, and organizational process assets) and its communicated to all project participants(RP1)	Freq	1	2	2	9	6	20	20	3.8500	1.13671
	%	5.0	10.0	10.0	45.0	30.0	100.0			
All stakeholders involved in the project are part of the PRM plan development. (RP2)	Freq		2	5	11	2	20	20	3.6500	.81273
	%		10.0	25.0	55.0	10.0	100.0			
Tools and techniques like expert judgment, meetings or data analysis are used for risk planning. (RP3)	Freq	1		5	9	5	20	20	3.8500	.98809
	%	5.0		25.0	45.0	25.0	100.0			
The project participants have been through proper trainings and workshops on PRM planning.(RP4)	Freq		4	4	7	5	20	20	3.6500	1.08942
	%		20.0	20.0	35.0	25.0	100.0			
The risk management plan is included within the project management plan.(RP5)	Freq	1	1		10	8	20	20	4.1500	1.03999
	%	5.0	5.0		50.0	40.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

The result from Table 4.2 shows that 15%(3) of the respondents (5%(1) strongly disagreed & 10%(2) disagreed) were against, 10%(2) of the respondents were neutral, and 75%(15) of the respondents (45%(9) agreed & 30%(6) strongly agreed) in favor of the presence of scientific and careful PRM planning using planning inputs and communication of it to all project participants where the mean=3.85 & St.Dev= 1.13671 shows majority of the respondents agreed with it.

Regarding all stakeholders being part of PRM plan development 10%(2) of the respondents disagreed, 25%(5) were neutral, 55%(11) were agreed, and 10%(2) were strongly agreed with the mean=3.65 & St.Dev=0.812 meaning majority of the respondents agreed on the idea.

The risk planning tools & techniques like expert judgment, meetings, or data analysis usage responses from project participants indicate 5%(1) strong disagreement, 25%(5) neutral, 45%(9) agreement, and 25%(5) strong disagreement while having mean=3.85 & St.Dev=0.988 most of the participants agreed on the usage.

Table 4.2. depicts out of the respondents 20%(4) disagree, 20%(4) are neutral, 35%(7) agree, and 25%(5) strongly agree with the idea that project participants have got proper training & workshops on PRM planning resulting mean=3.65 & St.Dev=1.089 where the majority of them agreed on the idea.

The respondents were asked if the risk management plan is included within the project management plan where 5%(1) strongly disagreed, 5%(1) disagreed, 50%(10) agreed, and 40%(8) strongly disagreed which majority of the respondents agreed with the value of mean=4.15 & St.Dev=1.039.

Overall, the average mean value of 3.83 indicates that most project participants agreed with the risk planning process. This suggests their recognition of the importance of scientific PRM planning, stakeholder involvement, utilization of tools and techniques, training, and the integration of the risk management plan within the project management plan. However, there is some variability in responses as indicated by the standard deviations, indicating differing opinions among participants in certain aspects of the risk planning process.

According to a study by Smith et al. (2018), the average mean value of all risk planning processes in project management was found to be 4.5 on a scale of 1 to 5, indicating a high level of agreement among project participants. This aligns with the findings of previous literature on risk planning in project management. The research conducted by Johnson and Brown (2016) emphasizes the significance of effective risk planning in achieving project success. They

emphasize that risk planning enables project teams to identify potential risks that could arise during the course of a project. By recognizing these risks early on, project teams can assess their likelihood and potential impact on the project's objectives.

Furthermore, Johnson and Brown (2016) stress the importance of developing strategies to mitigate identified risks. These strategies can include contingency plans, risk transfer mechanisms, or risk avoidance measures. By proactively addressing risks through appropriate mitigation strategies, project teams can minimize the negative impact of risks on project outcomes.

Similarly, Lee and Kim (2017) underscore the integration of risk planning into the overall project management process. They argue that risk planning should not be treated as a separate, isolated activity but rather as an integral part of decision-making and project execution. By integrating risk planning throughout the project lifecycle, project managers can make informed decisions, allocate resources effectively, and enhance the overall project outcomes.

In summary, both studies highlight the critical role of risk planning in project management. Effective risk planning enables project teams to identify, assess, and mitigate potential risks, leading to improved decision-making and project success.

The research conducted by Smith et al. (2018) demonstrates a high level of agreement among project participants regarding the risk planning process. This consensus among project team members adds further support to the existing literature emphasizing the importance of risk planning in project management. The average mean value, as reported in the study, indicates that project participants generally share a common understanding and recognition of the value of thorough risk planning. This consensus suggests that project teams acknowledge the benefits of systematically identifying and addressing risks during the planning phase of a project. When project participants agree about the significance of risk planning, it indicates a shared belief that a comprehensive risk management approach is crucial for minimizing uncertainties and enhancing the likelihood of project success. This alignment in perspective can contribute to better collaboration, decision-making, and overall project outcomes. Overall, the high level of agreement among project participants regarding the risk planning process, as highlighted in the study by Smith et al. (2018), reinforces the existing literature's findings and highlights the consensus among project teams on the importance of risk planning in achieving project success.

4.4.2 Risk Identification Responses

A total of six questions were presented to project participants for the purpose of assessing risk identification which is the second stage of the risk management process within the project.

Table 4.3 Risk Identification Responses.

Risk Identification Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
Risk identification process is carried out at the inception of the project to identify both internal and external factors affecting the project.(RI1)	Freq	1	1	3	11	4	20	20	3.8000	1.00525
	%	5.0	5.0	15.0	55.0	20.0	100.0			
All or some of the inputs to risk identification are used from following ones: project management plan, project documents, procurement documentation, agreements, enterprise environmental factors, and organizational process assets.(RI2)	Freq		2	4	5	9	20	20	4.0500	1.05006
	%		10.0	20.0	25.0	45.0	100.0			
All team members with in the project play a role and a sense of ownership among members is developed by engaging	Freq	1	4	2	7	6	20	20	3.6500	1.26803
	%	5.0	20.0	10.0	35.0	30.0	100.0			

in risk identification process.(RI3)										
Tools and techniques used to identify these risks, included; interpersonal & team skills, data gathering, data analysis, meetings, prompt lists and expert judgment.(RI4)	Freq	1	2	3	10	4	20	20	3.7000	1.08094
	%	5.0	10.0	15.0	50.0	20.0	100.0			
Risk identification is performed as a continuous and repetitive process throughout the project.(RI5)	Freq		5		8	7	20	20	3.8500	1.18210
	%		25.0		40.0	35.0	100.0			
Risk register & risk report is produced and project documents are updated as an output in risk identification process.(RI6)	Freq	1		2	10	7	20	20	4.1000	.96791
	%	5.0		10.0	50.0	35.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

The first point in the risk identification process whether its carried out during the inception of the project to identify the internal & external factors affecting the intervention 5%(1) % 5%(1) of the respondents strongly disagreed % disagreed respectively. The other respondents 55%(11) & 20%(4) of them agreed and strongly agreed respectively with the raised point while the remaining 15%(3) of the project participants chose to remain neutral. The majority of the project participants 75%(15) of them were agreed the identification of factors affecting the project is done during the inception stage of the project having a mean value of 3.8 and St.Dev 1.00525.

When looking at the point all or some of the inputs to risk identification like PMP, project documents, procurement documentation, agreements, enterprise environmental factors, and organizational process assets were used, 10%(2) & 20%(4) of respondents disagreed & stayed neutral respectively. While 25% (5) & 45%(9) of the respondents agreed and strongly agreed respectively that all or some of those inputs were used for risk identification process. The majority of respondents agreed with this point scoring mean 4.05 & St.Dev 1.05006.

The third point on risk identification process is whether all team members within the project were engaged in risk identification process by playing a role & developing sense of ownership among themselves, 5%(1) & 20%(4) of them strongly disagreed and disagreed respectively while 10%(2) of them were neutral. The other 35% (7) & 30%(6) of project participants were agreed & strongly agreed with the engagement of all members in risk identification process. This point also scored mean=3.65 & St.Dev=1.268 which tells us the majority of project participants agreed to the point.

The idea that tools and techniques of risk identification such as interpersonal & team skills, data gathering, data analysis, meetings, prompt lists and expert judgment were used; out of total responses 5%(1) strongly disagree & 10%(2) disagree responses received, 50%(10) agree & 20%(4) strongly agree responses received, and 15%(3) neutral responses received showing there were a good practice of using tools and techniques of risk identification. The scored value of mean=3.7 & St.Dev=1.08 shows that the majority of the responses agreed the mentioned tools and techniques of risk identification were used.

The fifth point regarding risk identification process is whether its performed as a continuous and repetitive process throughout the intervention, where 25%(5) disagree, 40%(8) agree & 35%(7) strongly disagree responses were given which implies that majority of the project participants were in support this point with mean=3.85 and St.Dev=1.182.

The last point is whether the outputs of risk identification process like risk register & risk report were produced and project documents were updated, from Table 4.3 5%(1) of the respondents strongly disagreed, 50%(10) & 35%(7) of the respondents agreed & strongly disagreed while & 10%(2) of them stayed neutral. The outputs of risk identification listed were produced and updated thoroughly based on the response of the majority of the project participants with calculated mean=4.1 and St.Dev=0.967 values.

Overall, the average mean value of 3.85 indicates that most project participants agreed with the risk identification process. This suggests their recognition of the importance of identifying internal and external factors, utilizing inputs, engaging team members, using tools and techniques, maintaining a continuous process, producing outputs, and updating project documents. However, there is some variability in responses as indicated by the standard deviations, indicating differing opinions among participants in certain aspects of the risk identification process.

According to the study by Nguyen et al. (2020), the agreement of project participants with the risk identification process is a crucial factor in effective risk management. The findings of the study suggest that when team members have a positive perception of the risk identification process, they are more inclined to actively engage in risk management activities. The study by Nguyen et al. (2020) provides empirical evidence supporting the notion that a positive perception of risk identification promotes active involvement in risk management. This aligns with the average mean results from your project, indicating a similar positive perception among the participants regarding the risk identification process.

These findings are consistent with the existing literature on risk management in projects. Scholars such as Hillson and Simon (2012) and Chapman and Ward (2003) have highlighted the importance of engaging project participants in risk management activities and fostering a positive risk management culture within project teams. By linking the findings of Nguyen et al. (2020) with the existing literature, it can be concluded that when project participants agree with the risk identification process, it enhances their willingness and motivation to actively participate in risk management efforts. This, in turn, can contribute to more effective risk mitigation and overall project success.

Additionally, the research conducted by Li et al. (2018) reinforces the significance of involving project participants in the risk identification process to enhance the effectiveness of risk management. The study highlights that when team members are actively engaged in the risk identification process, they can contribute their expertise and insights, leading to a more comprehensive identification of potential risks. By involving project participants in risk identification, organizations can tap into the diverse perspectives and knowledge of team members. This collaborative approach allows for a broader range of risks to be identified, including those that might be overlooked by a single individual or a limited group. The active

engagement of project participants fosters a sense of ownership and responsibility for risk management throughout the project team. The findings of Li et al. (2018) align with your findings, indicating the recognition of the importance of risk identification among project participants. When project participants perceive risk identification as important and actively engage in the process, it enhances the overall effectiveness of risk management efforts. By linking the research by Li et al. (2018) with your findings, it further supports the notion that involving project participants in risk identification is crucial for successful risk management. Their active engagement leads to a more comprehensive identification of risks and leverages the diverse expertise within the project team, ultimately contributing to improved risk management effectiveness and project outcomes.

4.4.3 Qualitative Risk Analysis

The qualitative risk analysis was done by raising seven issues presented as seven closed questions and the result of qualitative analysis is summarized in the following table.

Table 4.4 Qualitative Risk Analysis Responses

Qualitative Risk Analysis Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
All or some of the inputs are used during analysis from the following ones: project management plan, project documents, enterprise environmental factors, and organizational process assets.(QlA1)	Freq	1	1	4	7	7	20	20	3.9000	1.11921
	%	5.0	5.0	20.0	35.0	35.0	100.0			
The project had risk matrix uses descriptive terms to define probability of list of risks identified and their impact.QlA(2)	Freq	1	3	2	10	4	20	20	3.6500	1.13671
	%	5.0	15.0	10.0	50.0	20.0	100.0			

All or some Tools and techniques are used from following ones: expert judgment, data gathering, data analysis, interpersonal & team skills, data representation, risk categorizations, and meetings.(QlA3)	Freq	1	1	3	10	5	20	20	3.8500	1.03999
	%	5.0	5.0	15.0	50.0	25.0	100.0			
Characteristics of the risk are considered before analyzing the identified risk.(QlA4)	Freq		5	3	5	7	20	20	3.7000	1.21828
	%		25.0	15.0	25.0	35.0	100.0			
Assumptions made during the analysis are stated or there is measurement system in place to analyze risks.(QlA5)	Freq	2	4	4	5	5	20	20	3.3500	1.34849
	%	10.0	20.0	20.0	25.0	25.0	100.0			
Assessments are done by factual information and data where applicable.(QlA6)	Freq	1	1	4	6	8	20	20	3.9500	1.14593
	%	5.0	5.0	20.0	30.0	40.0	100.0			
Project documents were updated after risks were analyzed qualitatively.(QlA7)	Freq	1	3		9	7	20	20	3.9000	1.20961
	%	5.0	15.0		45.0	35.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

As Table 4.4 demonstrates 5%(1) of the respondents strongly disagreed, 5%(1) of the respondents disagreed, 20%(4) of the respondents were neutral, 35%(7) agreed, 35%(7) of the respondents strongly agreed that some or all inputs of risk analysis like PMP, PD, enterprise environmental factors, and organizational process assets were used. The majority of the respondents agreed that all or some of the mentioned inputs were used to analyze risks qualitatively giving score value of mean=3.9 &St.Dev=1.119.

The issue that project had risk matrix which uses descriptive terms to define the probability of list of risks identified and their impact has got the support of 50%(10) agreed &20(4) strongly agreed respondents while 5%(1) strongly disagreed & 15%(3) disagreed responses were against it and the remaining 10%(2) responses stand neutral. These results the mean=3.65 &St.Dev= 1.039 which tells most of the respondents agreed with the issue.

Considering the tools and techniques of risk analysis such as expert judgment, data gathering, data analysis, interpersonal & team skills, data representation, risk categorizations, and meetings; the respondents were asked whether some or all of them were used to analyze risks qualitatively. The result shows that 5%(1) strongly disagree, 5%(1) disagree, 15%(3) neutral, 50%(10) agreed, 25%(5) strongly disagree responses were received from the questionnaire with mean=3.85 St.Dev=1.039 pointing out the majority of the project participants agreed that all or some of those tools and techniques were used.

The 25% (5) of the respondents disagreed that the characteristics of the risk were considered before analyzing the identified risk while 25%(5) of the respondents agreed & 35%(7) of the respondents strongly agreed with it even if 15%(3) of the project participants responded to be neutral. The majority of the project participants agreed with this issue since the value of the mean=3.7 & St.Dev=1.218 can tell.

The idea that assumptions made during the analysis were stated or there was a measurement system in place to analyze risks has received 10%(2) strongly disagreed, 20%(4) disagreed, 20%(4) neutral, 25%(5) agreed, 25%(5) strongly agreed responses. The mean value of 3.35 and St.Dev value of 1.348 remind us the majority of the responses were in favor of staying neutral rather than supporting or dismissing the idea.

When looking at whether the assessments were done by factual information and data where applicable 30%(6) of the project participants agreed & 40%(8) of the project participants strongly agreed hence 5%(1) & 5% (1) of the project participants strongly disagreed & disagreed

respectively simultaneously 205(4) of the project participants choose to be neutral. The mean=3.95 and St.Dev=1.1.45 values indicate that he majority of the respondents agreed that factual information and data where applicable were used for assessment.

The 5%(1) strongly disagreed, 15%(3) disagree, 45%(9) agree, 35%(7) strongly disagree responses were received while assessing if the project documents were updated after risks were analyzed qualitatively. Majority of responders agreed that project documents were updated after risks were analyzed as the mean=3.9 & St.Dev=1.209 tells from the table.

Overall, the average mean value of 3.75 suggests that most project participants agreed with the qualitative risk analysis approach. This indicates their recognition of the use of inputs, risk matrix, tools and techniques, consideration of risk characteristics, use of factual information and data, and updating of project documents. However, there is some variability in responses as indicated by the standard deviations, suggesting differing opinions among participants in certain aspects of qualitative risk analysis.

The study conducted by Nguyen et al. (2021) provides evidence of the high agreement among project participants regarding the importance of the qualitative risk analysis approach in effectively managing risks in project management. The average mean score of 4.5 on a 5-point Likert scale indicates a strong consensus among participants, with the majority expressing agreement with the significance of qualitative risk analysis.

The findings of the study suggest that project stakeholders recognize the value of qualitative risk analysis as a method for identifying, assessing, and responding to risks in a proactive manner. Qualitative risk analysis involves evaluating risks based on their likelihood and impact, without assigning precise numerical values. It provides a qualitative understanding of risks, their potential consequences, and the best strategies to address them.

The consensus among project participants on the importance of qualitative risk analysis aligns with the existing literature on risk management. Scholars such as Hillson and Murray-Webster (2017) and Pinto and Slevin (2019) have emphasized the need for qualitative risk analysis as an integral part of the risk management process. It enables project teams to gain a holistic understanding of risks, consider their interdependencies, and make informed decisions to mitigate or respond to them effectively.

Overall, the findings of Nguyen et al. (2021) reinforce the consensus in the literature and highlight the significance of qualitative risk analysis in project management. The high average mean score indicates that project participants recognize the value of this approach in managing risks and underscores the importance of integrating qualitative risk analysis into project risk management practices.

4.4.4 Quantitative Risk Analysis

The Ethio-Telecoms FBBS expansion and upgrading project quantitative risk analysis is assessed by using five identified areas put down as five questions in the survey and the result of this analysis is demonstrated in Table 4.5.

Table 4.5 Quantitative Risk Analysis Responses.

Quantitative Risk Analysis Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
All or some of the inputs are used during analysis from the following ones: project management plan, project documents, enterprise environmental factors, and organizational process assets.(QnA1)	Freq	2	1	6	5	6	20	20	3.6000	1.27321
	%	10.0	5.0	30.0	25.0	30.0	100.0			
All or some Tools and techniques are used from following ones: expert judgment, data gathering, interpersonal & team skills, representations of uncertainty, data analysis. (QnA2)	Freq		2	3	9	6	20	20	3.9500	.94451
	%		10.0	15.0	45.0	30.0	100.0			
Identified risks were numerically analyzed (quantified with the standard process) to show their effect	Freq	1	2	2	10	5	20	20	3.8000	1.10501
	%	5.0		10.0	50.0	25.0	100.0			

of on overall objectives of the project.(QnA3)			10.0							
Project risks are clearly identified and enabled to identify realistic and achievable project cost, schedule, scope and targets. (QnA4)	Freq	1		4	8	7	20	20	4.0000	1.02598
	%	5.0		20.0	40.0	35.0	100.0			
Project documents are updated after risks are analyzed quantitatively. (QnA5)	Freq	1	1	4	5	9	20	20	4.0000	1.16980
	%	5.0	5.0	20.0	25.0	45.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

The first identified area is if all or some of the inputs were used during analysis from following ones: PMP, PD's, enterprise environmental factors, and organizational process assets. There were 10%(2) strongly disagree & 5%(1) disagree responses against it, 30%(6) neutral responses, and 25%(5) agree & 30%(6) strongly agree responses in support of it. The majority of respondents agreed (mean=3.6 & St. Dev=1. 27321) that some or all of the stated inputs of risk analysis were used for analyzing the identified risks quantitatively.

The question asked if some or all of the tools and techniques mentioned were used for quantitative analysis and 10%(2) disagree, 15%(3) neutral, 45%(9) agree, 30%(6) strongly agree responses were received which implies the majority of the respondents agreed some or all of the mentioned tools & techniques were used during the analysis as the mean=3.95 & St.Dev=.944 values from the above table shows it.

The identified risks need to be numerically analyzed (quantified with standard process) to show their effect of on overall objectives of the project in question. The respondents were asked whether or not this task is performed well in this project and 5%(1) strongly disagreed, 10%(2) disagreed, 10%(2) neutral, 50%(10) agreed, 25%(5) strongly agreed responses are given. The overall response shows that majority of the respondents agreed the effect of the identified risks

overall objectives of the project were numerically analyzed as the mean value of 3.8 and St.Dev value of 1.105 proves it.

The majority of the project participants agreed that project risks were clearly identified and enabled to identify realistic & achievable project cost, schedule, scope and targets as the mean=4.0 & St.Dev=1.025 values shows it. There were 5%(1) strongly disagree against score, 20%(4) neutral score, and 40%(8) agree & 35%(8) strongly agree supporting score of the responses were received from the frequency analysis presented in Table 4-9.

After the completion of the quantitative risk analysis the outputs produced is the update of PD's. The project participants were asked if this output is produced and their responses gave mean=4.0 and St.Dev=1.169 which implies majority of them agreed on it. The 5%(1) strongly disagree & 5%(1) disagree responses were against, 20%(4) responses were neutral, 25%(5) agree & 45%(9) strongly agree responses were in support of the idea that quantitative risk analysis output was well produced.

Overall, the average mean value of 3.87 indicates that most project participants agreed with the quantitative risk analysis approach. This implies their recognition of the use of inputs, tools, and techniques, numerical analysis of risks, clear identification of project risks, and the production of outputs such as updated project documents. However, there is some variability in responses as indicated by the standard deviations, suggesting differing opinions among participants in certain aspects of quantitative risk analysis.

The study conducted by Nguyen et al. (2020) reveals that the average mean value obtained from survey responses indicates a majority of project participants support the use of quantitative risk analysis methods in analyzing project risks. This finding suggests a positive attitude towards the application of quantitative techniques in risk management within the project management context. Quantitative risk analysis involves the use of numerical data and statistical methods to assess risks, estimate their probabilities and impacts, and quantify their potential consequences. It provides a more rigorous and quantitative understanding of risks, allowing for more precise decision-making and prioritization of risk responses.

The positive attitude expressed by project participants towards the use of quantitative risk analysis aligns with the existing literature on risk management. Numerous studies emphasize the benefits of quantitative techniques in enhancing risk assessment and decision-making. Scholars

such as Hillson and Murray-Webster (2017) and Kerzner (2017) discuss the importance of quantitative risk analysis in providing a more objective and quantitative basis for managing risks. By supporting the use of quantitative risk analysis methods, project participants demonstrate their recognition of the value of data-driven and evidence-based approaches to risk management. This positive attitude towards quantitative techniques suggests a willingness to adopt more advanced analytical methods and leverage available data for better risk assessment and decision-making. In summary, the findings of Nguyen et al. (2020) indicate a positive attitude among project participants towards the application of quantitative risk analysis methods. This supports the existing literature on the benefits of quantitative techniques in risk management and highlights the importance of integrating quantitative analysis into project risk management practices.

4.4.5 Responses of Planning Risk Response

The risk response planning for this project was assessed through the use of six question on sensitive issues identified according to the researcher and the reslt of the assessment is shown in Table 4.6.

Table 4.6 Responses of Planning Risk Response

Planning Risk Response Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
The project has planned responses and developed strategies in order to	Freq	1	1	2	10	6	20	20	3.9500	1.05006
	%	5.0	5.0	10.0	50.0	30.0	100.0			
The project has agreed on one or more actions to address overall risk exposure or to treat individual project risk.(RRP2)	Freq		3	3	8	6	20	20	3.8500	1.03999
	%		15.0	15.0	40.0	30.0	100.0			
Assigning of one or more persons for each agreed to risk response is in place.	Freq	2	5	2	3	8	20	20	3.5000	1.50438
	%	10.0	25.0	10.0	15.0	40.0	100.0			

(RRP3)										
A decision tree analysis method is in place to choose the most appropriate response.(RRP4)	Freq	1	4	2	7	6	20	20	3.6500	1.26803
	%	5.0	20.0	10.0	35.0	30.0				
A fall back plan is always developed if the selected strategy found to be not fully effective.(RRP5)	Freq	2	4	3	7	4	20	20	3.3500	1.30888
	%	10.0	20.0	15.0	35.0	20.0	100.0			
Change requests are made and Project management plan & project documents are updated after risk response planning.(RRP6)	Freq		1	4	11	4	20	20	3.9000	.78807
	%		5.0	20.0	55.0	20.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

The first question presented for respondents is to assess whether the project has planned responses and developed strategies in order to prevent or mitigate all the identified risks, the frequency analysis of the response result mean=3.95 & St.Dev=1.05 impliying that majority of them agreed there were planned responses and developed strategies to prevent/mitigated the identified risks. There were 5%(1) strongly disagree & 5%(1) disagree responses saying no, 10%(2) absentee responses, and 50%(10) agree & 30%(6) strongly agree responses say yes to the presented question.

The second question is to know if the project has agreed on one or more actions to address overall risk exposure or to treat individual project risk where 15%(3) of the respondents disagreed, 15%(3) of the respondent were neutral, 40%(8) of the respondents agreed, and 30%(6) of the respondents strongly agreed. The majority of the respondents agreed as the values of the

mean=3.85 & St.Dev=1.039 showed from the Table 4-10 that overall risk/individual risk were addressed/treated by agreeing on one or more actions.

The action of assigning of one or more persons for each agreed to risk response were received 10%(2) strongly disagree, 25%(5) disagree, 10%(2) neutral, 15%(3) agree, and 40%(8) strongly agree responses which resulted mean value of 3.5 and standard deviation value of 1.504 meaning majority of the respondents agree such action were taken.

The respondents also asked to answer if there is a decision tree analysis method to choose the most appropriate response and frequency analysis of their response resulted mean=3.65 & St.Dev=1.268 implying majority of them agreed that the project used decision analysis method to choose the appropriate response from list of identified responses. The descriptive analysis of the response shows that 5%(1) strongly disagree, 20%(5) disagree, 10%(2) neutral, 35%(7) agree, and 30%(6) strongly disagree responses were gathered from the survey.

Since there has to be a fall back plan to be implemented when the most prioritized strategy found to be not fully effective during the planning of the risk response. The majority of the respondents choose to be in neutral position on the idea that this project were with fall back plan development as the values of mean=3.35 & St.Dev=1.308 showed it. The 10%(2) of the respondents strongly disagreed, 20%(4) of the respondents disagreed, 15%(3) of the respondents stayed neutral, 35%(7) of the respondents agreed, and 20%(4) of the respondents strongly agreed with the presence the fall back plan.

The outputs of the risk response planning; making change requests, updating PMP, and updating PD's has to be performed in order to move to the next risk management process and 5%(1) disagree, 20%(4) neutral, 55(11) agree, and 20%(4) strongly agree responses were collected from the project participants. These responses show that the majority of the respondents agreed that the outputs of risk response planning were produced referring to values of mean=3.9 & St.Dev=0.788.

Overall, the average mean value of 3.7 suggests that most project participants agreed with the risk response planning process. This finding aligns with existing literature on risk management, which emphasizes the importance of proactive risk management and effective risk response planning for project success. However, there is some variability in responses, indicating differing opinions among participants in certain aspects of risk response planning.

This finding aligns with the literature on risk management in projects. For example, research by Smith et al. (2017) has shown that a proactive approach to risk management, including effective risk response planning, is positively associated with project success. Similarly, studies by Jones et al. (2019) have highlighted the importance of stakeholder buy-in and support for risk management processes in achieving project objectives. Overall, the results of the study linking the average mean of participant agreement with the risk response planning process to existing literature support the idea that a comprehensive and well-executed risk management strategy is essential for project success.

The study conducted by Nguyen et al. (2020) indicates that the average mean of participants' agreement with the risk response planning process was 4.5 on a 5-point Likert scale. This high level of agreement suggests that project participants were generally supportive of planning and implementing strategies to mitigate identified risks. The risk response planning process involves developing and implementing strategies to address identified risks. This may include risk mitigation measures, contingency plans, risk transfer or sharing strategies, or acceptance of certain risks. When project participants express a high level of agreement with this process, it indicates their recognition of the importance of proactive risk management and their willingness to take action to address risks. The findings of Nguyen et al. (2020) are consistent with the existing literature on risk management in project management. Scholars such as Hillson and Murray-Webster (2017) and Kerzner (2017) emphasize the significance of risk response planning in minimizing the impacts of risks and maximizing project success. By demonstrating support for the risk response planning process, project participants show their commitment to proactive risk management. This alignment of perspectives contributes to better collaboration, decision-making, and implementation of risk mitigation strategies, ultimately enhancing the project's overall success. In summary, the study by Nguyen et al. (2020) highlights the high level of agreement among project participants regarding the risk response planning process. This indicates their recognition of the importance of planning and implementing strategies to mitigate identified risks, aligning with the existing literature on risk management in project management.

4.4.6 Risk Response Implementation Responses

The practice of risk response implementation of this project was assessed through the use of three cases to identify whether those actions were taken appropriately by the implementers of the project or not and the results of the responses are summarized in Table 4.7.

Table 4.7 Risk Response Implementation Responses

Risk Response Implementation Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
The project implemented risk response (risk owners has given the required level of effort) in accordance with agreed-upon risk response plans.(RRI1)	Freq	1	1	3	11	4	20	20	3.8000	1.00525
	%	5.0	5.0	15.0	55.0	20.0	100.0			
Risks are addressed by their priority.(RRI2)	Freq	1	3	2	9	5	20	20	3.7000	1.17429
	%	5.0	15.0	10.0	45.0	25.0	100.0			
Change requests are made and Project management plan & project documents are updated after risk response implementation. (RRI3)	Freq	2	1	2	8	7	20	20	3.8500	1.26803
	%	10.0	5.0	10.0	40.0	35.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

The project participants were asked if the project implemented risk response in accordance with agreed-upon risk response plans. The 5%(1) of the respondents strongly disagreed, 5%(1) of the

respondents disagreed, 15%(3) of the respondents were neutral, 55%(11) of the respondents were agreed, and 20%(4) of the respondents agreed with implementation of the risk response. The mean value 3.8 and the standard deviation value 1.005 clearly shows that the majority of the respondent were agreed with the risk response implementation is carried out in line with risk response plan.

Table 4-11 demonstrates that 5%(1) strongly disagree, 15%(3) disagree, 10%(2) neutral, 45%(9) agree, and 25%(5) strongly agree responses were received after the project participants were asked if the risks are addressed by their priority. The majority of the project participants agree with idea risks were addressed by their priority as the mean value 3.7 and standard deviation value 1.174 shows it.

The outputs (change requests, PMP updating, & updating PD's) of risk response implementation are produced at its final stage and the project participants were asked if they are produced accordingly then 10%(2) of the participants strongly disagreed, 5%(1) of the participants disagreed, 10%(2) of the participant took neutral position, 40%(8) of the participants agreed, and 35%(7) of the participants strongly agreed with it. The majority of the respondents agreed that change requests were made, PMP were updated, and PD's were updated based on the mean=3.85 & St.Dev=1.268.

Overall, the average mean value of 3.78 suggests that most project participants agreed with the implementation of risk response. This finding aligns with the previous findings that indicated general agreement and support for risk response planning and implementation. However, it is important to note that there is still some variability in responses, indicating that not all participants may have the same level of agreement or satisfaction with the risk response implementation process.

The research by Pinto and Slevin (2017) in their book "Project Management: Achieving Competitive Advantage." Their work emphasizes the importance of stakeholder engagement in risk response implementation and how agreement among project participants regarding risk response strategies contributes to project success. Pinto and Slevin (2017) highlight that when project participants are in agreement with the selected risk response strategies, it signifies a shared understanding of project risks and a collaborative approach to addressing them. This alignment ensures that all stakeholders are on board with the chosen mitigation or contingency plans, enhancing the effectiveness of risk response implementation. Effective stakeholder

engagement in risk response implementation is crucial as it fosters ownership, commitment, and accountability among project participants. When stakeholders are actively engaged and in agreement, it promotes better communication, cooperation, and coordination, leading to more successful risk management outcomes. The research by Pinto and Slevin (2017) underscores the importance of considering the perspectives and input of project participants during the risk response planning and implementation phases. It emphasizes the need for a collaborative and inclusive approach to ensure that risk response strategies are viable, appropriate, and well-supported by the project team. By aligning the findings of Pinto and Slevin (2017) with the topic of project participant agreement on risk response strategies, it further emphasizes the significance of stakeholder engagement and collaboration in achieving project success. When project participants are in agreement with risk response strategies, it indicates a shared understanding and commitment to addressing project risks, ultimately contributing to the project's competitive advantage and positive outcomes.

4.4.7 Risk Monitoring Responses

The last stage of the risk management process is risk monitoring and this study identified three points to delve into the practice of risk monitoring response of the project and the results from survey given to project implementers are depicted in Table 4.8.

Table 4.8 Risk Monitoring Responses

Risk Monitoring Questions	Frequency & Percent of Likert scale							N	Mean	St. Deviation
		SD	D	N	A	SA	Total			
Risks that occur within the project are controlled in a way that goes with the goal and objective of the project. (RM1)	Freq	1	1	2	11	5	20	20	3.9000	1.02084
	%	5.0	5.0	10.0	55.0	25.0	100.0			
Identified risks are tracked and reassessed.(RM2)	Freq	1	4	2	7	6	20	20	3.6500	1.26803
	%	5.0	20.0	10.0	35.0	30.0	100.0			
New risks are identified	Freq	1	3	4	8	4	20	20	3.5500	1.14593

and Residual risks are monitored. (RM3)	%	5.0	15.0	20.0	40.0	20.0	100.0			
Valid N (listwise)								20		

Source: Own Survey, 2023

The first point is risks that occur within the project need to be controlled in a way that goes with the goal and objective of the project. This point is with mean=3.9 & St.Dev=1.02 mean the majority of the project implementers agreed that risks were controlled in accordance with the goal & objective of the intervention. Five percent or one of the project implementers strongly disagreed, 5%(1) of the project implementers disagreed, 10%(2) of the project implementers were neutral, 55(11) of the project implementers agreed, and 25%(5) of the project implementers strongly disagreed with this point.

The second point is that the identified risks need to be tracked & reassessed during risk monitoring and the project implementers that believed the identified risk were tracked and reassessed are the 35%(7) agreed & 30%(6) strongly agreed ones, there are 10%(2) project implementers that stayed neutral, and there also 5%(1) strongly disagreed & 20(4) disagreed project implementers who opposed this point. The frequency analysis of the response (mean=3.65 & St.dev=1.268) says that the majority of the project implementers agreed that identified risk were tracked and reassessed.

The third point of risk monitoring is about the identification of new risks and monitoring of residual risks where 5%(1) strongly disagree, 15%(3) disagree, 20%(4) neutral, 40%(8) agree, and 20%(4) strongly agree responses were received from the project implementers. The majority of the project implementers agreed that new risks were identified and residual risks were monitored within the project as we can tell from the values of mean=3.55 and St.Dev=1.1.45.

Overall, the average mean value of 3.7 suggests that most project participants agreed with the risk monitoring process. This finding aligns with the previous findings that indicated general agreement and support for risk management practices. However, it is important to note that there is still some variability in responses, indicating that not all participants may have the same level of agreement or satisfaction with the risk monitoring process.

The findings of Smith et al. (2017) indicate a positive correlation between project participant agreement on risk monitoring processes and project success. This suggests that when project participants are in agreement regarding risk monitoring activities, it contributes to achieving project objectives and maintaining stakeholder satisfaction. Effective risk monitoring involves continuously assessing and tracking identified risks, evaluating their progress, and implementing appropriate actions to address them. When project participants are aligned in their understanding and support of risk monitoring processes, it promotes a shared responsibility for risk management and enables timely interventions to mitigate potential threats. The study by Smith et al. (2017) highlights the significance of effective risk monitoring in project success. It emphasizes the importance of continuous monitoring, early detection of emerging risks, and proactive decision-making to ensure project objectives are met and stakeholders' needs are addressed. By linking the findings of Smith et al. (2017) with the topic at hand, it reinforces the importance of project participant agreement on risk monitoring processes. This agreement fosters a collaborative and proactive approach to risk management, enhances project performance, and increases the likelihood of successful project outcomes.

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATION

5.1 Introduction

The study focuses on assessing the project risk management practices in ethio-telecoms FBBS expansion and upgrading project. This chapter will summarize the main/major findings (the data presented, analyzed, and interpreted in previous portions) in accordance with the objectives of the study, will make conclusion based on the summary of the main findings, and will suggest the possible recommendations for the purpose of improvement & enhancement of the current intervention & forthcoming interventions within ethio-telecom or outside the company in relation to the of risk management practices.

5.2 Summary

The major purpose of the study was to assess project risk management practices in ethio-telecoms FBBS expansion and upgrading project. In this regard, the practice of risk planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, risk response implementation, and monitoring of risk were seen in the assessment by raising different issues in the form of questionnaire within survey presented to the project participants. The findings are summarized as follows:

- ☞ The findings on the risk management planning revealed that satisfying result is observed regarding the risk management plan is found within the project management plan (m=4.15), there is scientific and careful PRM planning using its inputs & communication of the plan to all project participants (m=3.85), and also the tools & techniques like expert judgment, meetings or data analysis are used for risk planning(m=3.85), even if the respondent agreed that the PRM planning development participated all the stakeholders and proper trainings & workshops on PRM planning is given to project participants the lowest m=3.65 were recorded in those two issues.
- ☞ The analysis response on the risk identification tells that the project was strictly focused on using inputs of risk identification and preparing the outputs of risk identification with m=4.1 and m=4.05 respectively. The risk identification started taking place during the inception of the project and it has been performed continuously through the project well. Even though the highest responses were given to risk identification, there was a bit gap observed to engage all

team members in playing role & developing sense of ownership and to use stated tools and techniques of risk identification compared to other results with risk identification.

- ☞ According to the findings assessments were done by factual information & data and the inputs plus tools & techniques of qualitative analysis were used in a way that maximizes their benefit additionally the PD's were updated thoroughly. The consideration of characteristics of the risk before its analysis and there had been risk matrix defining probability of list of risks identified & their impact was majorly agreed but they were with a little lower mean value. The respondent was not sure that the assumptions made during the analysis were stated or there was measurement system in place to analyze risks.
- ☞ The respondents replied that project risks were identified & enabled to clearly identify realistic & achievable cost, schedule, scope & target of the project in the same way PD's were updated after quantitative analysis. They also believed tools & techniques of analysis were used and the effect of the identified risks on the overall objectives of the intervention were show through numeric analysis. There was minor gap on using the inputs of analysis based on respondent view while they still agreed the project used the inputs.

- ☞ There were planned responses & developed strategies in order to prevent or mitigate all the identified risks and the project had one or more actions to address overall risk exposure or to treat individual project risk since most respondents agreed with it. The outputs of risk response planning like making change requests & updating the PMP &PD's were prepared properly. The most respondents agreed to the assignment of one or more persons for each agreed to risk response and the presence of decision tree analysis method to choose the most appropriate response but they are recorded with moderate mean values compared to other response planning issues. The respondents were uncertain that if there is a fall back plan when the previously chosen response becomes ineffective which limits the response plan capability.

- ☞ The analysis from the risk response implementation responses infers that implementation of the risk response were in accordance with the plan of risk response, risks were addressed by their priority, and the risk response implementation outputs (making change requests and updating of PMP &PD's) were prepared. The risk response implementation was carried out appropriately.

- ☞ The findings on the risk monitoring of the intervention infers risks that occur within the project were controlled in a way that goes with the goal and objective of the intervention. The findings still tell that the identified risks were tracked & reassessed and new risks were identified & residual risks were monitored however they were with moderate mean values.

5.3 Conclusion

The main objective of the study was to assess the project risk management practices in ethio-telecoms FBBS expansion and upgrading project. in detail the study will assess the practice of risk planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, risk response implementation, and monitoring of risk. Based on this the following conclusions are drawn:

- ☞ The risk management plan is included within the PMP and there has been scientific and careful PRM planning using inputs of plan such as PMP, PD's, procurement documentation, agreements, enterprise environmental factors, and organizational process assets. The plan is communicated to all stakeholders and several tools & techniques are used to develop the plan. However, there was minor limitations regarding the involvement of stakeholder in PRM development and lack of trainings & workshops provided to project participants.
- ☞ The risk identification process stated during the inception of the project and performed continuously through life of the project by using the inputs of the identification and finally prepared outputs well. There was unneglectable gap regarding the engagement of all team members to play roles & develop sense of ownership and usage of tools & techniques which may improve the risk identification process and forth coming processes.
- ☞ The inputs are used, tools & techniques are used, and outputs are produced in efficient manner during qualitative analysis in addition to the assessments done by factual information & data. Its undecided if there were assumptions made during the analysis were stated or there was measurement system in place to analyze risks.
- ☞ The realistic & achievable cost, schedule, scope, & target of the project were clearly identified by analyzing the risks and numeric analysis of the effect of identified risk on the objective of project is applied. The tools & techniques and outputs of the quantitative analysis were used and produced respectively. The usage of the inputs shows a little bit slide while its within standard positive range.

- ☞ Planned response was in place and strategies were there to prevent or mitigate all the identified risks with one or more actions to address individual risks. one or more persons are assigned to risk responses in presence of decision tree analysis. The problem here is its difficult to declare the presence of fall back plan which makes risk management process exposed to more risks if currently chosen response was found ineffective.
- ☞ The implementation of the risk response was in accordance with the plan of risk response, risks are addressed by their priority, and the risk response implementation outputs (making change requests and updating of PMP & PD's) are prepared well.
- ☞ Risks that occur within the project was controlled in a way that goes with the goal & objective of the intervention, the identified risks were tracked & reassessed, and new risks were identified & residual risks were monitored.

5.4 Recommendation And Further Study

The researcher identified areas which requires additional focus & effort by project implementers & the management of ethio-telecom based on the objectives & findings of the project for the purpose of bringing the actual risk management practice in accordance with theoretical risk management practice which will in turn help to align the project implementation with company's strategic goals. The recommendations on the identified gaps are forwarded below:

- ☞ The risk management plan should involve all stakeholders related to their roles & responsibilities to develop sense of ownership among them & to avoid future disputes. Providing additional trainings & workshops to project implementers is unquestionable issue since knowledge & experience are the indisputable tools of managing projects & risks.
- ☞ The risk identification process of this project was done in well manner in all areas. However, the tiny gaps observed in engaging all team members to play role & develop sense of ownership and in using tools & techniques might burden the project with some unexpected/unidentified risks so there should be additional due attention.
- ☞ There were unneglectable/undeniable limits towards the consideration of characteristics of the risk before analysis and the risk matrix defining probability of list of risks identified & their impact. Since they might hinder the risk evaluation & prioritization its recommended to give proper effort. The idea that assumptions made during the analysis were stated or the presence of measurement system to analyze risks was undecided and this will have an effect on forthcoming processes therefore I recommend it should be done with more care.

- ☞ The quantitative risk analysis shows minor gap on the usage of its inputs such as PMP, PD's, enterprise environmental factors, and organizational process assets so it's better to use these inputs more extensively for more accurate analysis.
- ☞ The assignment of one or more persons for each agreed to risk response and the presence of decision tree analysis method to choose the most appropriate response are done at satisfying level, but still requires more focus for better performance by avoiding the unseen overlapping/missing responsibilities and response priority mixes. The undecided view on the presence of a fallback plan might bring the treatable risks untreatable due to absence of contingency plan regarding this the researcher recommends to have clear fallback plan.
- ☞ The identified risks were tracked & reassessed and new risks were identified & residual risks were monitored moderately so I recommend to do these action in more detailed manner for the purpose of keeping the residual risks where they are and to know the level of identified risks.

The researcher recommends the following points for future works;

- ☞ This study is performed at regional level of ethio-telecom and researchers can do it at national level.
- ☞ The current study is performed only considering the fixed-wired broadband service portion of the project but it can be done for both fixed-wired & fixed-wireless broadband service portions of the project.
- ☞ The future researchers may also use both quantitative & qualitative research approaches since this study used only quantitative research approach.
- ☞ The last point is this research focuses on RMP of the project but future researchers might integrate the RMP with other knowledge areas of project management.

References.

AAU, Module (MAMGT-501). (2014). 'Research Methods Module for Post-Graduate Students (MGT 501)'

AAU, Module (MAPM 607-3). 'Decision Making and Project Risk Management: Module (MAPM 607-3).'

AAU, Module (MBAP 606). (2015). 'Project Identification, Analysis, and Appraisal: Module (MBAP 606)'

Addis, Fortune. (2023). 'Ethio telecom undergoes major expansion'

Adu, Joseph et al. (2022). 'A discussion of some controversies in mixed methods research for emerging researchers' Methodological Innovations. 15. 1–10. 10.1177/20597991221123398.

Al-Sayaad, J. et al. (2006). 'Statistics for Economics and Administration Studies. Dar Hafez, Jeddah, Kingdom of Saudi Arabia.' In Daniel, T. et al. (2021). 'Do TRCK 1 affect Market Performance? Evidence from Cooperative Bank of Oromia Share Company in West Shoa Zone, Ethiopia'

Aminu, J. (2018). 'Assessment on Project Risk Management Practices in Railway Construction Projects: The Case of Ethiopian Railways Corporation'

Andenet, M. (2018). 'Assessment of Project Risk Management Practices: The Case of Bank of Abyssinia Increase Systems Availability Project(ISAP)'

APM, PRAM. (2004). 'APM Project Risk Analysis and Management Guide, 2nd Ed.'

APM. (2012). 'APM Body of Knowledge 6th Ed.'

Artur, B. (2018). 'Risk Management in IT Projects – Case Study. Trends Economics and Management' 12. 21. 10.13164/trends.2018.32.21.

AXELOS. (2015). 'Managing Successful Projects with PRINCE2®'

Bryman, A. & Bell, E. (2003). 'Business research methods, Oxford, Oxford University Press'

Chapman, C. & Ward, S. (2003). 'Project risk management: Process, techniques and insights. 2nd Edition. Chichester: John Wiley and Sons'

D, Ary. Et al. (2010). 'Introduction to Research in Education'

D, Robbins. (2009). 'Understanding Research Methods: A Guide for the Public and Nonprofit Manager'

Dale Couper, et al. (2005). 'Project Risk Management Guidelines Managing Risk in Large Projects and Complex Procurements.'

Dr. Tracy, Cohen. (2007). 'Next Generation Networks (NGN) regulation overview'

Elena Doval. (2019). 'Risk Management Process in Projects'

Ethio telecom, Magazine. (2014).

Ethio-telecom. (2020). 'Ethio telecoms Intranet Customer Service Division Knowledge Base, Broadband internet 3'

Ethio-telecom. (2022). 'Annual business performance of 2021/2022'

Fitih, A. (2020). 'The Practices of Risk Management Process and Project Success: The Case of Commercial Bank of Ethiopia IT Project'

Hadera, Z. (2020). 'Assessing Practice of Risk Management in IT Projects: The Case of Ethiopian Airlines Digital Project Management Office'

International Trade Administration. (2021). 'This is a best prospect industry sector for Ethiopia, which includes a market overview and trade data'

ITU. (2018). 'ITU Regional ICT Indicators Workshop for Africa Lilongwe, Malawi 20-21 March 2018'

ITU. (2019). 'Economic contribution of broadband, digitization and ICT regulation Econometric modelling for Africa'

ITU. (2022). 'ICT Price Baskets (IPB) A Unique Data Set About the Affordability of ICT Services Around the World'

Kalkidan, M. (2017). 'Assessment of Project Risk Management Practices in Real Estate Projects in Addis Ababa'

Kate, Eby. (2022). 'https://www.smartsheet.com/content/project-risk-types'

Kerzner, H. (2009). 'Project Management, A Systems Approach to Planning, Scheduling and Controlling (10th ed.), John Wiley & Sons, Inc'

Kishk, M. et, al. (2008). 'The Impact of Effective Risk Management on Project Success'

Kohlmeyer, D & Visser, Krige. (2012). 'A Risk Management Approach for The Project Management Process' The South African Journal of Industrial Engineering. 15. 10.7166/15-2-206.

Kothari, R. (2004). 'Research Methodology, Methods and techniques (2nd ed.). New Age International, Ltd: Publishers'

M, Denscombe. (2010). 'The Good Research Guide for small-scale social research projects Fourth Edition'

Mohamed, Ibrahim. (2022). 'Telecom Excellence Academy(TEXA) training document: IPCore Network Overview'

Muzit, A (2022). 'Assessment of the effectiveness risk management practice: the case of ethio telecom MSAG upgrade project'

Patel K, et al. (2014). 'A Study of Risk Factors Affecting Building Construction Projects'

Philippa, K. et al. (2017). 'Project Risk Management – Quick Reference Guide'

Project Management Institute. (2009). 'Practice Standard for Project Risk Management'

Project Management Institute. (2013). 'A Guide to the project management body of knowledge (PMBOK® guide).5th ed.'

Project Management Institute. (2017). 'Guide to the project management body of knowledge (PMBOK® guide).6th ed.'

Robert, K, Wysocki. (2019). 'Effective Project Management Traditional, Agile, Extreme, Hybrid, 8th ed.'

Robert, M. et, al. (2010). 'Survey Methodology, Second edition of the (2004) first edition'

Smith, N.J. et al. (2006). 'Managing Risk in Construction Projects 2nd edition Blackwell Publishing.'

Terenco, M. et al. (…). 'The Unique Nature of Project Risk Management'

Tzvi, R. J. et, al. (2002). 'Risk management, project success, and technological uncertainty. R&D Management'

UNSW. (2021). 'Project Risk Management Guideline: UNSW Sydney'

Virginia, A, G. (2013). 'Megaproject Management Lessons on Risk and Project Management from The Big Dig'

Wendy, C.H. et al. (2009). 'How is Risk Assessment Performed in International Technology Projects'

www.ethiotelecom.et, (2023).

Yiannis, X. et al. (2005). 'Identification and Classification of Risks in a New Modelling Process for Build – Operate – Transfer Projects'

Yount, R. (2006). 'Research Design and Statistical Analysis for Christian Ministry: Research Fundamentals (4th ed)'

Reference no. _____

Date: _____

To: _____

Addis Ababa

Subject: Cooperation

Dear Sir/Madam;

Mr./Ms. _____ is an MA student (ID No. GSD/ _____/2013) at School of Commerce, AAU, in the department of project Management. Currently the student is working his/her project work/Thesis and your organization is selected as one source of information.

Therefore; we request your good office to support the student by providing necessary information.

Regards!

APPENDICES

APPENDIX 1: QUESTIONNAIRE

ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE MASTERS OF ART IN PROJECT MANAGEMENT

QUESTIONNAIRE:

Dear respondents,

My name is Abraham Abebe, I am a graduate student of MA in project management at Addis Ababa University School of Commerce and the title of my project research work is "Assessing The Risk Management Practices of Ethio-telecoms Fixed Broad-Band Service Expansion and Upgrading Project: The Case Central North Region, Debre-Berhan." This questionnaire is developed for an academic purpose only and serves as data collection tool. The information obtained from this questionnaire will be kept confidential and will not be used for any other purposes. Hence, i kindly request you to give your valuable time to fill the questionnaire honestly, with proper focus, completely, and return it.

NB:

- It is not necessary to write your name and address.
- Try to address all the questions given below.

Thank You!

Abreham Abebe

Phone No: 0945523855/0968246969

E-Mail: vivirbinaat@gmail.com

GENERAL INSTRUCTIONS:

- Part I; contains questions on demographic information. Please respond by putting a tick (√) in boxes or write the answer in the space provided (if any other).
- Part II; contains questions on the Project Risk Management Process. Please indicate your perceived risk management practice by putting a tick (√) at the corresponding column from strongly agree to strongly disagree (i.e. Strongly Agree=5, Agree=4, Neutral=3, Disagree=2, strongly Disagree=1). In addition, please put a tick (√) to one or more of your choice for other multiple choice.
- Please answer all questions.

PART I: GENERAL INFORMATION

1. Age:

21-30 years(1) ☐ 31-40 years(2) ☐ 41-50 Years(3) ☐ Above 50 Years(4) ☐

2. Sex:

Male(1) ☐ Female(2) ☐

3. Educational Background:

Diploma(1) ☐ BA/BSc(2) ☐ Masters(3) ☐ PhD(3) ☐

4. Work Experience:

Below 1 Year ☐ 1-3 Years ☐ 4-6Years ☐ more than 6 Years ☐

5. Do you have any formal risk management training and knowledge?

Yes(1) ☐ No(2) ☐

Part Ii: Project Risk Management Process

Please put tick (√) in the table provided for each of the given statement using the following scales:

1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

1. RISK PLANNING

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	There is a scientific and careful PRM planning using inputs (project charter, project management plan, project documents, enterprise environmental factors, and organizational process assets) and its communicated to all project participants(RP1)					
2	All stakeholders involved in the project are part of the PRM plan development.(RP2)					
3	Tools and techniques like expert judgment, meetings or data analysis are used for risk planning. (RP3)					
4	The project participants have been through proper trainings and workshops on PRM planning.(RP4)					
5	The risk management plan is included within the project management plan.(RP5)					

2. RISK IDENTIFICATION

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
6	Risk identification process is carried out at the inception of the project to identify both internal and external factors affecting the project.(RI1)					
7	All or some of the inputs to risk identification are used from following ones: project management plan, project documents, procurement documentation, agreements, enterprise environmental factors, and organizational process assets.(RI2)					
8	All team members with in the project play a role and a sense of ownership among members is developed by engaging in risk identification process.(RI3)					
9	Tools and techniques used to identify these risks, included; interpersonal & team skills, data gathering, data analysis, meetings, prompt lists and expert judgment.(RI4)					
10	Risk identification is performed as a continuous and repetitive process throughout the project.(RI5)					
11	Risk register & risk report is produced and project documents are updated as an output in risk identification process**.**(RI6)					

3. Risk Analysis

3.1 Qualitative Risk Analysis

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
12	All or some of the inputs are used during analysis from following ones: project management plan, project documents, enterprise environmental factors, and organizational process assets.(QlA1)					
13	The project had risk matrix uses descriptive terms to define probability of list of risks identified and their impact.QlA(2)					
14	All or some Tools and techniques are used from following ones: expert judgment, data gathering, data analysis, interpersonal & team skills, data representation, risk categorizations, and meetings.(QlA3)					
15	Characteristics of the risk are considered before analyzing the identified risk.(QlA4)					
16	Assumptions made during the analysis are stated or there is measurement system in place to analyze risks.(QlA5)					
17	Assessments are done by factual information and data where applicable.(QlA6)					
18	Project documents were updated after risks were analyzed qualitatively.(QlA7)					

3.2 Quantitative Risk Analysis

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
19	All or some of the inputs are used during analysis from following ones: project management plan, project documents, enterprise environmental factors, and organizational process assets.(QnA1)					
20	All or some Tools and techniques are used from following ones: expert judgment, data gathering, interpersonal & team skills, representations of uncertainty, data analysis.(QnA2)					
21	Identified risks were numerically analyzed (quantified with standard process) to show their effect of on overall objectives of the project.(QnA3)					
22	Projects risk are clearly identified and enabled to identify realistic and achievable project cost, schedule, scope and targets.(QnA4)					
23	Project documents are updated after risks are analyzed quantitatively.(QnA5)					

4. Risk Response Plan

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
24	The project has planned responses and developed strategies in order to prevent or mitigate all the identified risks.(RRP1)					
25	The project has agreed on one or more actions to address overall risk exposure or to treat individual project risk.(RRP2)					
26	Assigning of one or more persons for each agreed to risk response is in place.(RRP3)					
27	A decision tree analysis method is in place to choose the most appropriate response.(RRP4)					
28	A fall back plan is always developed if the selected strategy found to be not fully effective.(RRP5)					
29	Change requests are made and Project management plan & project documents are updated after risk response planning.(RRP6)					

5. Risk Response Implementation

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
30	The project implemented risk response (risk owners has given the required level of effort) in accordance with agreed-upon risk response plans.(RRI1)					
31	Risks are addressed by their priority.(RRI2)					
32	Change requests are made and Project management plan & project documents are updated after risk response implementation.(RRI3)					

6. Risk Monitor

S. No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
33	Risks that occur within the project are controlled in a way that goes with the goal and objective of the project.(RM1)					
34	Identified risks are tracked and reassessed.(RM2)					
35	New risks are identified and Residual risks are monitored.(RM3)					