SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PROJECT MANAGEMENT

THE EFFECT OF PROJECT MONITORING AND CONTROLLING PRACTICE ON PROJECT PERFORMANCE: IN CASE OF 5G NETWORK EXPANSION PROGRAM, ETHIOTELCOM

BY: MESKEREM BEZU

ID. NO:SGS/0694/2014A

ADVISOR- YILKAL WASSIE (ASST. PROF)

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ADDIS ABABA, ETHIOPIA

ST. MARY UNIVERSITY

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A THESIS SUBMITTED TO THE ST. MARY UNIVERSITY, SCHOOL OF POSTGRADUATE STUDIES IN PARTIAL FULFILLMENT FOR THE AWARD OF DEGREE IN MASTER OF PROJECT MANAGEMENT

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DEC, 2024

ADDIS ABABA, ETHIOPIA

DECLARATION

I, MESKEREM BEZU, the under signed, declare that this proposal entitled: **"The Effect of Project Monitoring And Controlling Practice on Project Performance; In Case of 5g Network Expansion Program, Ethiotelcom "** is my original work. I have undertaken the proposal independently with the guidance and support of the research supervisor. This study has not been submitted for any degree or diploma program in this or any other institutions and that all sources of materials used for the thesis has been duly acknowledged.

_____	_____	_____
Name of student	**Signature**	**Date**

This is to certify that the proposal entitled "**The Effect of Project Monitoring And Controlling Practice on Project Performance; In Case of 5g Network Expansion Program, Ethiotelcom "** submitted in partial fulfilment of the requirements for the degree of **Masters of project management of the Postgraduate Studies,** Admas University and is a record of original proposal carried out by **MESKEREM BEZU, PM/SGS/0694/14,** under my supervision, and no part of the proposal has been submitted for any other degree or diploma. The assistance and help received during the course of this investigation have been duly acknowledged. Therefore, I recommend it to be accepted as fulfilling the proposal requirements.

Yilkal Wassie (Asset Prof)		**15/12/2024**
Name of advisor	**Signature**	**Date**

CERTIFICATION OF APPROVAL OF THESIS
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This is to certify that; the researcher has carried out this research work. This work is original in nature and submitted in partial fulfillment of the requirement for the degree of master compile with the regulation of the collage and meets the accepted standard with the regulation of the collage and meet the accepted standard with respect to originality and quality.

Name of candidate: Meskerem Bezu Sig_____ Date_____

Name of advisor: Yilkal Wassie (Asst. Prof) Sig_____ Date_____

Signature of board examiners

External examiner_____ Sig_____ Date_____

Internal examiner _____ Sig_____ Date_____

Dean Sigs_____ Sig_____ Date_____

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ACRONYMS

ECPE	Ethiopia Country Program Evaluation
PCM	Project Cycle Management
PMBOK	Project Management Body of knowledge
PMI	Project Management Institutions
PMLC	Project Management Life Cycle
PMO	Project Management Office
PRINCE	Project in Controlled Environments
SPSS	Statistical Package for Social Science
TEP	Telecom Expansion Program
USAID	United States Agency for International Development

Contents

Abstract

Examining the effect of project monitoring practice and project control practice on project performance in the case of 5G network expansion program in Ethio telecom was the study's main goal. A combination of explanatory and descriptive research designs, along with a quantitative research approach, were used to achieve the study's intended goal. 136 sample respondents were selected using convenance sampling technique. Primary cross-sectional data were used in the study, and a structured survey questionnaire was used to collect data. The deployed data was analyzed using regression analysis using OLS technique and descriptive statistics. This study employed the most popular reliability test technique, Cronbach's Alpha coefficient, to guarantee the dependability of the deployed data. The Cronbach's Alpha coefficient test result thus verified the validity of the data used in this investigation. Correlation analysis revealed a strong positive relationship between project performance and both project monitoring practice (r = 0.731) and project control practice (r = 0.512). Regression analysis confirmed that both project monitoring practices and project control practices have statistically significant positive effects on project performance. Therefore, it is suggested that the project management of 5G expansion project of Ethio-telecom should enhance the process for analyzing project data to proactively identify and mitigate potential risks. the project management of 5G expansion project of Ethio-telecom should also implement strategies to address any delays that might hinder meeting the planned completion date.

Key words: Project monitoring practice, project controlling practice, project performance

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

According to Gaibo (2019), monitoring is the compilation and analysis of data about either a specific program or operation, while evaluation is an appraisal aimed at answering queries about the program or intervention. Both concepts portray tracking of continuous assessments that is mostly focused on fixed deadlines and scheduled events during job planning & implementation stages. It assists with keeping the project on track and will alert the management team if things aren't going as planned during the project's execution. If executed properly, it is a valuable guide for project management and provides a solid foundation for assessment. Evaluation is more about the results/outcomes and impact of the project. It is usually a periodic assessment of changes in the predetermined results that relates to the program or the interventions of a project (Goyder, 2005). It supports the project manager to determine whether the project has met its goals and objectives as well it enables to make decisions about the project's future. Crawford and Bryce (2015) cited by Gaibo, et al.(2019) stated that Monitoring and Evaluation (M&E) has become a leading priority for many development and humanitarian organizations. Advancements in measurement approaches, indicators and targets, performance monitoring and managing for results (impact) have been made in recent years in order to adequately and effectively evaluate progress and program impact on development matters.

The success of projects plays a key role in achieving organization growth and development. Most project managers appreciate that monitoring and evaluation of projects is important if the project objectives and success is to be achieved. Project monitoring and evaluation exercise adds value to the overall efficiency of project planning, management and implementation by offering corrective action to the variances from the expected standard (Charles, et al., 2015).

An effective monitoring and evaluation is a major contributor to project success and hence the use of technology to compliment the efforts of the M&E team will strengthen it; which will in turn lead to value addition by the team. Monitoring and Evaluation (M&E) of project improves overall efficiency of project planning, management and implementation and therefore various projects are started with the sole goal of changing positively the sociopolitical and economic status of the residents of a given region (Estrella, 2017).

Monitoring and Evaluation is becoming an area of growing importance for many organizations and development community at large. It allows those involved in development activities to learn, to achieve better results and to be more accountable. There is increased interest in M&E among the development community due to a stronger focus on the results produced by interventions. World Bank, (2011) noted that in the absence of appropriate monitoring and evaluation, it will be impossible to determine if the intended results are being accomplished as expected, what corrective steps might be taken to ensure delivery of the intended results, and if interventions are making meaningful contributions towards human development.

Projects to be effective and efficient, it should be monitored and evaluated. Bruce (2005), clarified that it is a common complaint that tracking and assessment data does not affect decision-making during project execution or preparation for future project progress and new initiatives. This chasm reflects the lack of learning processes in M&E systems practice. And where learning processes occur, they are often given less attention than accountability mechanisms, resulting in a void that can last and valuable opportunities for learning from knowledge and applying what has been learned being overlooked.

Monitoring is descriptive in nature and gives information on where a project is at any given time relative to respective targets and outcomes (Nyonje, Ndunge, & Mulwa, 2012). Evaluation on the other hand, is the systematic and objective assessment of a project and gives evidence of why targets and outcomes are or are not being achieved. It seeks to address issues of causality (Ogula, 2002). Applied as a function, monitoring and evaluation is an integral part of project management involving a system of reflection and communication supporting project implementation (Nuguti, 2009).

Monitoring, whilst seen as an on-going management function, and evaluation as the post- event function, which feeds information back to management for the next event, is too simplistic a distinction. In monitoring one is evaluating, as one is making a judgment about progress and intervening based on this judgment (UNDP, 2010). Similarly, when one does an evaluation, one does so on the basis of monitoring data, and judgments can best be made with these insights. In practice, the sequencing is not as linear as one following the other, but more dynamic depending on the situation (Khan, 2001).

Ethio-telecom, in general have diverse development intervention projects to make significant change in community livelihoods. Therefore, this study is designed to examine the effect of the monitoring and evaluation factors that influence performance of projects, a case of 5G network expansion program in Ethio Telecom.

1.2 Background of the Organization

Telecommunication in Ethiopia dates back to 1884. Ethiopian Telecommunications Corporation is the oldest public telecommunications operator in Africa. In those years, the technological scheme contributed to the integration of the Ethiopian society when the extensive open wire line system was laid out linking the capital with all the important administrative cities of the country. After the end of the war against Italy, during which telecommunication network was destroyed, Ethiopia re-organized the Telephone, Telegraph and Postal services in 1941. In 1952 the Imperial Board of Telecommunications was established by proclamation No. 131/52 in 1952. The Board had full financial and administrative autonomy and was in charge of the provision and expansion of telecommunications services in Ethiopia. The Imperial Board of Telecommunications of Ethiopia, which became the Ethiopian Telecommunications Authority in 1981, was placed in charge of both the operation and regulation of telecommunication services in the wake of the market reforms country. In 1996, the Government established a separate regulatory body, the Ethiopian Telecommunication Agency

(ETA) by Proclamation 49/1996, and during the same year, by regulation 10/1996, the Council of Ministers set up the Ethiopian Telecommunications Corporation (ETC). Under the supervision of the ETA, the principal duty of ETC is maintaining and expanding telecommunication services in the country and providing domestic and international telephone, telex, and other communicate on services. In this respect, currently ETC is the only operator of any telecommunication related service. As the continuation the 2005/06-1909/10 five-year plan and after concentrating its efforts on education, health and agriculture, the Ethiopian government has decided to focus on the improvement of telecommunication services, considering them as a key lever in the development of Ethiopia. Ethiopian Telecommunication Corporation was transformed to new structure called Ethio telecom on Monday 29th November 2010, which is a state owned company, with ambition of supporting the steady growth of our country and within the Growth Transformation Plan (GTP). Ethio telecom is the only telecom service provider in our country and provides variety products and services like internet, mobile, land line connection, data service and ISP services like email, web site, domain name and others. The Telecom Expansion Program of Ethio telecom was planned and started in 2013 to achieve the telecom sector expansion objective of the growth and transformation program specifically to solve the quality, coverage and capacity challenges of the network service.

1.3. Statement of the problem

Project Monitoring and Evaluation is one of the critical elements of the project management cycle. Internationally progressive projects hinge their success on continuous or routine process of data collection to measure extend of performance against target and goals. Controlled, Monitoring and evaluation significantly improve project performance (Westland, 2006). Poor project performance attributes to limitations in application of monitoring and evaluation as a component of project management cycle. Advent of new tools, techniques and advances in project monitoring and evaluation methodologies gears performance of development projects. Project donors, beneficiaries and stakeholders demand for evidence of project performance against targets.

According to Ethiopia Country Program Evaluation [ECPE] (2010), in Ethiopia, most of the organizations do not use monitoring and evaluation system in appropriate manner for their projects. Although, existing assessment of monitoring and evaluation capacity in Ethiopia reveal gaps both institutional and individual skills development for monitoring and evaluation according to a report on capacity building in Africa (Ethiopia) by the World Bank (2006). There are many misconceptions and myths surrounding M&E like; it's difficult, expensive, requires high level skills, time and resource intensive, only comes at end of a project and it is someone else's responsibility (IFC, 2008). IFC evaluated that there is often a sense of frustration because expectations of M&E activities appear to outstrip resources and skill sets (IFC, 2008).

Most projects in developing countries in general and in Ethiopia in particular face a huge cost and time overrun. This cost and time overrun can be minimized by using effective monitoring and evaluation system in projects (Ermias, 2007).

In a situation that there is scarcity of resources especially shortage of foreign currency, projects that consume imported materials and use foreign currency should be monitored and evaluated effectively. Unless projects are monitored in a way that can teach project participants how to save resources or minimize costs and use the available time effectively, the challenges of monitoring and evaluation should be examined. Effective use of opportunities can also help to improve performance of the project. The effectiveness and efficiency of projects can again contribute for increasing productivity in the company in particular and in the economic system in general.

This depicts a need to bridge the knowledge and practices gap in monitoring and evaluation in the Ethiopian context. This study sought to investigate the effect of the monitoring and evaluation practice on project performance in case of 5G network expansion, Ethio telecom.

1.4 Research Questions

This particular study sought to answer the following research questions;

- What is the effect of project monitoring practice on project performance in the case of 5G network expansion project.
- What is the effect of controlling practices on project performance in the case of 5G network expansion project.
- What is the status of the practice of monitoring and controlling in the case of 5G network expansion project?

1.5 Objective of the Study

1.5.1 General Objective

The overall purpose of this study is to examine the effect of monitoring and controlling practice on project performance of 5G network expansion program in Ethio telecom.

1.5.2 Specific Objectives

Based on the general objective of the study, this study has the following specific objectives.

- To examine the effect of project monitoring practice on project performance in the case of 5G network expansion project.
- To investigate the effect of controlling practices on project performance in the case of 5G network expansion project.
- To assess the status of the practice of monitoring and controlling in the case of 5G network expansion project1

1.6. Significance of the Study

This study will be believed to fill the existing gaps for projects monitoring and evaluation in Ethio telecom and other sectors of the country and has the following significance:

The research findings will be serving as a useful source of information for project managers, development planners, practitioners, researchers and academician who are engaged in project M&E endeavors.

The research findings will be serving as a useful mirror for Ethio telecom and public sectors to enhance development projects by filling identified projects monitoring and evaluation gaps.

The research findings will also be a useful source of information for researchers, graduate program students, public policy formulators and analysts while conducting studies on related topics.

The research will also be useful for donors, Government organizations and civil societies who want an insight in to the Monitoring and evaluation system in public sectors of the countries.

1.7. Scope of the Study

The scope of this descriptive survey research is only to the effect of project monitoring and controlling practice on project performance of 5G network expansion project work performance in Ethio-telecom. The study will assesses M & C practices of planning, technical expertise, stakeholder involvement, management participation and their influence on project practices. The study restricted itself to on Ethio telecom guidelines on monitoring and evaluation practices mainly on 5G network expansion project.

1.8. Limitation of the Study

This study is to investigate the monitoring and evaluation factors influencing success of projects in case of 5G network expansion program in Ethio telecom. In relation to this project, Ethio telecom identified telecom circles and selected companies that can implement them. This study will included staff's or participants from that circle. Due to time and budget constraints, this study will be limited to one organization and one program that is 5G network expansion.

1.9 Organization of the study

The following chapters will serve as the structure for the research paper. The study's introduction, which provides a quick summary, is covered in Chapter 1 along with the study's

goals, scope, significance, and research questions. The literature review is briefly presented in the second chapter, research methodology is covered in the third chapter, and data presentation, analysis, and study findings are covered in the fourth chapter. Lastly, the findings' conclusions and suggestions are included in the fifth chapter.

CHAPTER TWO

LITERATURE REVIEW

Introduction

2.1 Background of rapid growth in mobile technology/5G applications and investments

Over the past few decades, there has been a rapid expansion and evolution of mobile communication technology globally. The first generation of mobile networks or 1G started commercial operations in the early 1980s, providing basic voice calling services. This was followed by 2G networks in the 1990s which enabled SMS texting and low-speed data. The advent of 3G networks from the late 1990s onwards allowed mobile internet access and multimedia applications such as photo sharing and video calling to flourish (ITU, 2020).

However, it was the introduction of 4G Long-Term Evolution (LTE) broadband mobile networks from 2009 that truly brought about a transformation. 4G LTE networks delivered significantly higher peak data rates and could support high-bandwidth applications like high definition video streaming, online gaming and virtual/augmented reality (Gallagher & Haunschild, 2018). As 4G networks proliferated globally over the 2010s, it ushered in the era of smartphones and mobile internet-dependent applications. Total 4G subscriptions grew from just 200 million worldwide in 2010 to over 5 billion by the end of 2019, accounting for around 55% of total mobile subscriptions (Ericsson, 2020).

Given the success of 4G LTE, attention has now turned to the impending rollout of 5G networks worldwide. 5G is envisioned to bring capabilities that take mobile connectivity a step further. While the exact specifications are still being finalized, 5G networks are expected to offer peak data rates of up to 20 Gbps (about 100 times that of 4G), end-to-end latencies of 1 ms and connectivity for up to a million devices per square kilometer (ITU, 2020; Rajagopalan, 2021). Such high performance will enable a diverse range of new applications from augmented/virtual reality and autonomous vehicles to smart cities and remote healthcare (Yamin, 2020).

Early 5G applications have already emerged from 2019 onwards in major markets following the launch of non-standalone (NSA) networks utilizing existing 4G infrastructure. Over 2021-2022,

fully standalone (SA) 5G networks independent of 4G are envisioned to commence globally which will truly realize the promised capabilities (Deloitte, 2019). Major telecom operators, equipment vendors and technology companies around the world have invested heavily in the development and large-scale rollout of 5G networks and services in a bid to gain competitive advantage. A recent benchmarking study estimated cumulative global investments in 5G networks had touched USD 235 billion by mid-2020, of which USD 83 billion was spent in 2020 alone despite facing challenges due to COVID-19 (Strategy Analytics, 2020).

As 5G technology matures over the next decade, it is projected to generate substantial socio-economic benefits and facilitate innovations across multiple sectors. Estimates put the global 5G economic impact at USD 13.2 trillion between 2020-2035, with contributions from improved productivity, new applications and urban development (IHS Markit, 2019). Industries from manufacturing and healthcare to retail and education can leverage the high speed, low latency and mass connectivity of 5G for numerous transformations. For example, factories are increasingly adopting 5G enabled smart robotic arms, sensors and Industrial Internet-of-Things (IIoT) systems for flexible automation (Ericsson, 2020). Similarly, 5G may help drive smarter transportation through connected autonomous vehicles, drones and traffic management systems (Ofcom, 2019).

2.1.1 Importance of telecom infrastructure for national development in developing countries

Given the transformative power of 5G and digital technologies more generally, building robust telecommunication networks has become a priority for economic and social development globally. However, unlike developed nations, enabling optimal conditions for mobile connectivity poses additional challenges for developing countries with limited resources and infrastructure. Studies have found a positive correlation between investments in mobile networks and growth metrics for lower-income countries (ITU, 2018; GSMA, 2020). Well-developed digital ecosystems have been shown to accelerate economic growth by up to 1.5% annually (Akerman et al, 2015).

For developing nations, overcoming connectivity gaps is crucial for empowering citizens, attracting investments, diversifying economies and catching up to industrialized peers. Telecommunications development helps expand inclusive access to services like banking, healthcare, education and government support which are even more essential for vulnerable populations. It also acts as a catalyst for wider modernization and job creation across multiple sectors like agriculture, commerce, tourism and construction (UNCTAD, 2019).

Empirical research indicates that a 10% increase in mobile penetration could generate economic impacts of 0.6–1.4% of GDP per year for developing countries (GSMA, 2013; Qiang et al, 2009). Studies have highlighted correlations between improving digital infrastructure and metrics such as enhanced productivity, increased FDI flows, poverty reduction and creative industry development (Deloitte, 2019; ITU, 2018). For example, increased mobile money transfers driven by telecom expansion helped alleviate poverty levels in some African nations (Aker & Mbiti, 2010).

Beyond direct economic benefits, strengthening connectivity further supports progress on the United Nations' wider sustainability goals including health, education and gender equality (UN, 2020). As the COVID-19 pandemic demonstrated, resilient digital systems proved invaluable for delivering services remotely to vulnerable populations during lockdowns across the developing world (UNCTAD, 2020).

While returns from investments in telecoms can be significant, it remains a complex long-term endeavor requiring enabling policies, robust regulations and efficient project execution capabilities which poorer nations lack. Careful planning and stakeholder management is vital to avoid wastages that often occur in other infrastructure sectors of developing countries plagued by issues like corruption, cost overruns and unsustainable debt burdens (World Bank, 2018). Going forward, sustainable investment in 5G networks and digital skills will be imperative for latecomer developing economies.

2.1.2 Overview of Ethiopia's economy and ambitions of becoming a digital hub in Africa

Ethiopia provides an apt case study to analyze challenges in building telecom infrastructure in a developing country context transitioning to a digital future. As Africa's second most populous country with over 115 million people, Ethiopia has experienced strong economic growth averaging 9% per year over the past decade, making it one of the world's fastest growing non-oil economies (World Bank, 2021). However, it starts from a low base with GDP per capita of just USD 878 in 2020, ranking it amongst the lowest income economies globally (UNDP, 2020).

Despite sustained progress, Ethiopia continues to face socio-economic challenges related to poverty, job creation and access to services outside major cities. Digital transformation initiatives have been recognized by the government as playing a pivotal role in accelerating inclusive growth, industrialization and transition to a knowledge economy (MoC, 2020). As part of its developmental roadmap, Ethiopia aims for GDP per capita of over USD 3,000 by 2025 through industries like textiles, agro-processing and manufacturing for exports (GoE, 2021). Large-scale investments are planned under state leadership into sectors like electricity, logistics, aviation and ICT infrastructure seen as prerequisites for such an economic transition.

In the era of global digitization, Ethiopia also seeks to position itself as a competitive digital hub serving the East African region's 170 million population and further afield (EthioTelecom, 2020). To achieve its digital aspirations, Ethiopia's National Information and Communication Technology (ICT) policy outlines objectives around universal broadband access, e-government services, tech literacy, startup ecosystem development and leading within the African Continental Free Trade Area (AFCFTA) framework (MoC, 2018). Telecommunications infrastructure deployment is recognized as the foundational enabler for realizing these digital visions.

However, unlike most peers, Ethiopia did not embark on early telecom reforms or private sector participation. Until mid-2010s, state-owned Ethio Telecom held a monopoly with basic services and limited network quality (UNCTAD, 2019). Liberalization reforms were announced in 2018 allowing new operators to enter this untapped market of over 100 million subscribers with under 20% penetration rates presenting huge growth potential (Frost & Sullivan, 2020). Ethiopia aims to become a lower middle-income economy by 2025 through boosting digital access nationwide,

which in turn necessitates building modern 5G networks along with reforming telecommunications policies.

2.2. Project Management

2.2.1 Definitions and evolution of project management concepts, principles and practices

Project management as a formal academic discipline and professional field has evolved significantly since the 1950s. The Project Management Institute (PMI, 2013) defines a project as "a temporary endeavor undertaken to create a unique product, service or result". It involves coordinating people and resources to achieve clearly defined objectives within constraints of cost, time and quality.

Historically, nascent concepts were rooted in techniques deployed for large construction projects as early civilizations built monumental infrastructure thousands of years ago (Morris, 2013). Modern project management practices emerged in post-war era projects responding to growing industrialization and specialization demanding efficient coordination of multi-disciplinary activities (Shenhar & Dvir, 2007). As technology innovation accelerated new product development from 1950s, project management offered structured approaches to deliver advanced engineering capabilities on schedule (Morris, 2013).

A key development was the identification of five distinct Process Groups of Project Management viz. Initiating, Planning, Executing, Monitoring/Controlling and Closing by the PMI in its seminal Guide to the Project Management Body of Knowledge (PMBOK) first published in 1967 (PMI, 2023). This provided a basis for standardizing the project lifecycle into logical phases to be planned and monitored systematically. Several complementary frameworks emerged in subsequent decades enhancing the scope and approach of managing increasingly complex globalized projects. Notable amongst these were Prince2 from UK offering planning procedures, Risk Management processes from Canada and Agile methodologies from software development industry throughout the 1990s-2000s (Kwak & Ibbs, 2002).

Today, project management principles are widely accepted in diverse domains from construction and manufacturing to IT, healthcare and entertainment projects globally. Core elements include scope definition, timeline scheduling, cost estimation, procurement planning, risk analysis, change control, stakeholder management, performance tracking and post-completion reviews (PMI, 2023). Technological advances have enabled sophisticated planning software, productivity tools and techniques like Critical Path Method (CPM), PERT charts and Earned Value Management (EVM) to be applied rigorously throughout project lifecycles requiring diligent oversight to deliver strategic objectives on predetermined quality standards.

2.2.2 Importance of the project management process groups (initiation, planning, execution etc.)

The five process groups identified in PMBOK form a logical sequential framework for managing projects systematically and comprehensively from concept to closure. Effectively applying each phase allows addressing inherent challenges through a iterative but organized process as follows:

Initiating: This phase involves defining the need, scope, objectives and stakeholders for a new project. It lays the foundations for investment planning, resource requirements and high-level scheduling. Poor initiation lacking clarity can negatively impact downstream activities.

Planning: Detailed planning takes the concept further by breaking down deliverables, tasks, dependencies, establishing a baseline schedule, budget, risk response strategies and quality metrics. Comprehensive planning underpins successful project execution.

Executing: In this phase, day-to-day tasks are performed, issues tracked and changes managed as per approved plans. Smooth coordination across team members and vendors is crucial at execution stage to achieve targets.

Monitoring & Controlling: Ongoing supervision ensures project integrity by tracking progress, flagging deviations early, updating plans and reprioritizing work proactively. Correction measures then avert escalations.

Closing: Completing all contractual obligations, assessing lessons, transfer of ownership and obtaining stakeholders' sign-off concludes the project. Closure documentation provides historical data and audit evidence.

Adhering to standardized process groups introduces structure, orderliness and predictability even amidst uncertainties (PMI, 2013). By comprehensively addressing all five phases through key activities, tools and knowledge areas, project complexities can be better tackled. Neglecting any phase impacts successive stages, leading to increased risks, delays and unsatisfactory outcomes (Kirsopp, 2007). The process framework offers a common language and basis to benchmark performance.

2.2.3 Application of project management practices in telecom infrastructure projects

Given the enormous investments, technical challenges and long lifecycles involved, managing telecom network build-outs necessitates rigorous project management practices. Components ranging from passive infrastructure, transmission networks, core systems to IT modernization require detailed planning akin to large-scale construction initiatives (ITU-T, 2012). Additionally, integrating infrastructure upgrades seamlessly with ongoing operations requires careful change and risk management considering service level impact (GSMA, 2019).

Telcos worldwide apply comprehensive project management customized to their technology roadmaps, organizational structures and norms. Common approaches incorporate principles and methods like Work Breakdown Structure (WBS), Responsibility Assignment Matrix (RAM), Critical Path Scheduling, Earned Value techniques, Risk Registers, Stakeholder Engagement Plans spanning all five process groups (Ericsson, 2017). Project Management Offices (PMOs) coordinate resources and vendor dependencies, track progress against baselines, ensure documentation and close contracts as per compliance requirements.

Specialized telecom project management teams bring together competencies in RF/backhaul engineering, IT systems architecture, civil works supervision, business operations and change management. They apply customized solutions factoring telco business realities like rolling capital expenditure cycles against revenue milestones, disruptive competitive actions and regulatory impacts in dynamic markets (Nokia, 2021). Tools range from generic offerings to

industry specific solutions providing capabilities around telecom network design, OSS/BSS integration, investment tracking and service-level incident management (Huawei, 2020).

Emerging practices reflect shifts in telco landscape towards agile methods for rapidly evolving technologies and digital services demand (Deloitte, 2013). Customer focused sprints, iterative development and continuous integration adopted from software domains now guide efforts in areas like Cloud Native networks, edge computing and AI-driven Operations (GSMA, 2020). Yet, core project management fundamentals remain indispensable due to massive upfront costs and long lead times for telecom infrastructure build outs requiring prudent capital allocation over years (Calabrò, 2018).

2.2.4 Unique challenges of managing large-scale telecom projects in developing countries

While adopting global best practices, managing telecom projects in developing markets brings unique challenges that demand diligent mitigation strategies. Key difficulties faced include:

Geographical constraints due to remote/mountainous terrains extending timelines and raising costs substantially. Skills shortages amidst massive capacity development needs despite limited vocational training options locally (Capizzi & Fernandes, 2019). Administratively complex land acquisition and right-of-way clearance processes delaying critical civil works (Adb, 2016). Vulnerabilities to macroeconomic shocks like currency devaluations in emerging markets that threaten cashflows. Restrictive policies around imports, foreign investments and cross-border contracting initially in many nations (UNCTAD, 2019). Nascent regulatory frameworks and limited precedents on technology specific guidelines like for 5G spectrum assignments compared to developed peers. Risk averse culture, lack of precedents and experience with large private infrastructure investments heightening uncertainties. Higher costs of capital due to perceived country risks deterring commercial financing participation (GSMA, 2019). Political instability, security issues or corruption allegations in some geographical contexts undermining project economic viability. Weak logistics networks inflating supply chain costs and unreliable power/transport increases delivery timelines substantially (WDS, 2019)

2.3. Project Monitoring and Control

2.3.1 Definitions of key terms - monitoring, controlling, feedback loops

Effective project monitoring and control practices are vital for successful implementation given uncertainties inherent in dynamic initiatives. PMBOK (2013) defines project monitoring as the "collection and measurement of information to assess project performance" and controlling as "actions taken to influence project activities to meet objectives".

The monitoring process comprises defining metrics, collecting baseline and real-time performance data to estimate variances using techniques like EVM and SPI/CPI indicators (Kerzner, 2017). This allows identifying deviations from targets early, determining root causes and recalibrating plans proactively before issues escalate out of control.

The control process employs correction mechanisms through structured change management when variances exceed pre-set thresholds, with the aim of realigning project status to approved baselines. It involves activities such as updating scope, schedule, budgets, procurement management plans, risk responses and other variables based on insights from monitoring activities (Prabhakar, 2008).

2.3.2 Traditional tools - CPM, Earned Value Management (EVM), Variance analysis etc.

Some common quantitative and analytical tools employed for project monitoring and control include:

Critical Path Method (CPM): A baseline scheduling technique depicting interdependencies between tasks to identify the critical path influencing timely completion (Kerzner, 2017). Program (or Project) Evaluation and Review Technique (PERT): Extends CPM by incorporating probabilistic durations and slack floats for contingency planning under uncertainties (Lewis, 2007). Earned Value Management (EVM): Measures schedule and cost performance by comparing planned, earned and actual values to quantify variances proactively (Anbari, 2003). Helpful KPIs include SPI, CPI, BAC, EAC etc. Variance analysis: Explains deviations between targets and actual achievements by analyzing causal factors like incomplete specifications, underestimated durations or higher complexity encountered (PMI, 2013). Statistical techniques:

Methods such as control charts, regression, simulation assess probabilistic risks and optimize schedules considering historical productivity trends and risk exposures (Kerzner, 2017). Milestone tracking: Monitors agreed interim deliverables critical for downstream activities against planned dates to flag delays for corrective actions (ProjectEngineer, 2019).

Traditional tools provide objective, measurable indices to uncover issues systematically and take pre-emptive decisions through techniques managers are familiar with for replanning reliably. They form the core of major monitoring practices globally.

2.3.3 Contingency-based monitoring - Agile, PRINCE2, Critical Chain Project Management

Given inherent uncertainties, adaptive approaches factoring contextual variables are also adopted:

Agile project management: Focuses on iterative planning-execution cycles through daily stand-ups, burndown charts, retrospectives facilitating flexible responses to changes (VersionOne, 2018) PRINCE2 (Projects In Controlled Environments): Combines five principles, seven themes and structured processes providing flexibility through customized arrangements like tailoring, thresholds and exception procedures (Axelos, 2017).

Theory of Constraints/Critical Chain: Prioritizes bottleneck tasks, incorporates buffers, relies on project velocity to better address resource constraints and uncertainties impacting schedules (Leach, 2005).

Evo method: A scenario-based framework evolving plans considering six dimensions of uncertainty through impact-uncertainty matrices and adaptive road-mapping (Lim & Mohamed, 1999).

Contingency-based philosophies help manage ambiguity, incompleteness and emergent requirements which traditional predictive models struggle with, through iterative decision making, learning and flexibility built into systems.

2.3.4 Factors determining choice of monitoring approach - Complexity, Uncertainty, Culture

Key determinants for selecting appropriate monitoring strategies include (Anbari, 2003; Kerzner, 2017):

Project size, complexity, technologies involved: Large, complex initiatives necessitate formal tools while smaller efforts use leaner practices. Degree/type of uncertainty: High ambiguity/variability warrants agile, predictive analysis; stable projects rely on deterministic approaches. Stage in project lifecycle: Initiating favors flexibility, control tightens during implementation. Organizational structure, culture: Centralized/decentralized setups; collaborating/command cultures influence level of oversight rigor. Resources, expertise availability: Rich/scarce skills, tools determine monitoring rigour and customization needs. Regulatory compliance needs: Strict regulations induce formal processes; others allow choice. Project objectives, constraints: Monitoring supports priorities like schedule vs cost; budget influence sophistication levels.

2.3.5 Monitoring challenges in infrastructure projects - Data availability, Resource constraints

Specific hurdles encountered include:

Data availability: Information gaps persist in infrastructure projects spanning years with incomplete as-built drawings, change requests (Kapp & Edward, 2013). Resource constraints: Shortages of monitoring expertise, specialized software capabilities are common in developing contexts (GlobalInfrastructureHub, 2018). Competing stakeholder priorities: Balancing needs across owners, contractors, communities during operations poses challenges (Loosemore & Hsin, 2001).

System integration complexities: Infrastructure assets consisting of diverse sub-systems from civil to HVAC require integrated control and visibility (Bröchner & Brady, 2005). Logistical obstacles: Remote locations hinder physical site inspections necessitating digital/remote monitoring applications (Song et al., 2009). Macroeconomic uncertainties: Currency

fluctuations, political instability, policy shocks introduce contingencies into long term infrastructure investments (Yescombe, 2014).

2.4. Project Performance

2.4.1 Traditional measures - Time, Cost, Quality (iron triangle)

Project performance evaluation most commonly focuses on the classical 'Iron Triangle' metrics of time, cost and quality representing the key objectives that monitoring and control processes seek to influence (Atkinson, 1999).

Time: Adherence to scheduled implementation deadlines is a basic measure of efficiency. Delays undermine stakeholders' expectations and result in expenses like penalties, interest costs (Liu & Walker, 1998).

Cost: Completion within budget is a primary rationale for projects across sectors. Overruns erode profits, investor confidence and organizational reputation if recurrent (Flybjerg et al., 2003).

Quality: Conformance to predefined technical specifications, standards and warranties signals achievement of project goals. Defects necessitate reworks impacting viability (Pinto & Slevin, 1988).

2.4.2 Extended dimensions - Customer satisfaction, Benefits realization

Emerging perspectives expand traditional views by emphasizing intangible stakeholder-centric outcomes:

Customer satisfaction - Extent to which delivered solution fulfills user needs, quality expectations over the longer term (Jugdev & Müller, 2005).

Benefits realization - Tangible/intangible returns accruing to sponsoring organizations or broader community from new capabilities (OGC, 2007).

Stakeholder engagement - Successful involvement, resettlement and empowerment of affected groups impacted by developments (IFC, 2018).

Social/environmental impacts - Footprint on sustainability issues like carbon footprint, ecology conservation (ESTEEM, 2005).

Strategic alignment - Degree to which initiatives contribute to higher level business or program goals (Cooke-Davies, 2002).

2.4.3 Frameworks - Balanced Scorecard, Project Success Index, Project Management Success Model

Various frameworks help operationalize multi-dimensional performance measurement systematically:

Balanced Scorecard: Integrates financial and non-financial metrics across learning/growth, internal process, customer, financial perspectives (Kaplan & Norton, 1992).

Project Success Index: Aggregates critical success factors of time, cost, quality, user satisfaction through weighted scoring (Shenhar et al., 1997).

Iron Triangle++ Model: Adds factors like strategic objectives, operational functionality, organizational/professional development (Atkinson, 1999).

Project Management Success Model: Represents influences of project efficiency, impact on client satisfaction and business success (Shenhar et al., 2001).

Benefits Management Framework: Tracks achievement of intended/emerging benefits realized through Gateway Reviews (OGC, 2007).

Social Project Success Assessment Method: Qualitatively rates social, environmental, economic, institutional outcomes (IFC, 2018).

2.4.4 Objective vs. Subjective performance evaluation criteria

Performance analysis demands judicious application of both objective quantitative measures and subjective qualitative assessments (Pinto & Slevin, 1988; Ika, 2009):

Objective data sources include budgets, schedules, conformance records facilitating auditable reporting. However, they present a narrow production-focused view.

Subjective evaluations through customer/stakeholder surveys, expert panels addressing intangible aspects like satisfaction, deliver higher level strategic perspectives.

Perceptual information is prone to observer biases compared to factual numbers but offers insights beyond finances.

Adopting balanced scorecards incorporating both categories presents a holistic assessment while maintaining oversight rigour (Kaplan & Norton, 1992).

Triangulating subjective and objective evidence through mixed methods aids substantiated conclusions acceptable to varied stakeholder groups.

Selecting an optimum balance optimizes reliability, validity and comprehensiveness of insights gleaned from performance appraisals given their multi-dimensional nature.

2.4.5 Performance measurement challenges in developing countries

Developing contexts pose distinct difficulties in gauging project outcomes systematically:

Data scarcity on subjective aspects like social returns due to incomplete baseline studies and impact assessments (IFC, 2018). Inconsistencies in documentation, record keeping and measurements constrain objective analyses (Ofori, 2013). Limited expertise, budget and tools to operationalize frameworks replicably at scale (Gajendran et al., 2014). Vulnerability of perception data to socio-political influences on respondent objectivity in sensitive project contexts (Ika et al., 2012).

Comparability issues due to contextual project complexities not addressed in standardized frameworks developed externally (Ika & Donnelly, 2017). Attribution problems isolating project impacts amidst broader developmental changes over long time horizons (Kherallah & Kirsten, 2001).

2.5. Factors Influencing Project Performance

2.5.1 Literature identifying internal factors - Scope, Risk, Communication

Scholarly research exploring drivers of project success has identified several organizational attributes under management's control impacting outcomes:

Scope Definition: Clear statement of deliverables, assumptions avoids scope creep negatively impacting schedules, budgets (Ika, 2009).

Project Manager's Competence: Relevant technical, leadership skills to coordinate dispersed multi-disciplinary resources (Yang et al., 2011).

Stakeholder Engagement: Buy-in fostered through participation, addressing concerns maintains support critical for approvals (Mok et al., 2015).

Risk Management: Proactive identification and mitigation plans incorporating contingencies boost resilience to threats (Wallace et al., 2004).

Resource Availability: Adequacy and stability of finances, human capital, materials support planned productivity levels (Pinto & Prescott, 1988).

Communication: Timely sharing of status updates, issues and corrective actions across stakeholders builds transparency and trust (Cooke-Davies, 2002).

Schedule Development: Realistic activity sequencing and durations factoring constraints result in achievable timelines (Lester, 2007).

Change Management: Flexibility to incorporate scope adjustments smoothly through documented processes safeguards plans (Ika, 2009).

2.5.2 External factors - Economic, Political, Regulatory environment

Beyond managerial levers, project outcomes are also subject to uncontrollable external environmental influences:

Economic Conditions: Macroeconomic stability, foreign exchange rates, market forces impact costs, contractual risks (Almajali & Dahalin, 2011).

Political Will: Leadership turnover, unrest disrupting established priorities necessitating replanning (Ika & Donnelly, 2017).

Regulatory Policies: Compliance requirements, approval timelines, policy shifts necessitate adaptive strategies (Aubry et al., 2007).

Technological Shifts: Emerging innovations within project timeframe necessitating upgrades or scope revisions (Flyvbjerg, 2014).

Natural Events: Weather incidents, natural disasters introduce contingencies in scheduling, resourcing (Johnson et al., 2007).

Community Support: Socio-political acceptability influences access to sites, local participation levels (Shah, 2007).

2.5.3 Theories - Contingency Theory, Stakeholder Theory, Resource-Based View

Several theoretical frameworks also analyze performance significance of contextual factors:

Contingency Theory: Suggests no universal best practices; approach is contingent upon nature of project/organization and environment (Laufer & Hoffman, 2017).

Stakeholder Theory: Emphasizes that addressing needs of affected groups through engagement fosters accomplishment of diverse objectives beyond financial targets alone (Yang et al., 2009).

Resource-Based View: Establishes competitive advantage from unique resource availability and capabilities aligned to environmental dynamics and priorities (Barney, 1991).

Institutional Theory: Highlights significance of established norms, regulations and protocols as informal performance determinants within contexts (Scott, 2008).

Agency Theory: Underlines how goal congruence between principals/agents govern project viability dependent upon relationships and trust built over commitments (Eisenhardt, 1989).

Theories deepen understanding on heterogeneous nature of influences across diverse organizational-environmental settings which practitioners ought to navigate strategically.

2.5.4 Moderating role of project complexity, uncertainty and institutional contexts

Key moderators impacting factor-performance links established through prior research include:

Project Complexity: High technological intricacy/novelty calls for tailored mitigation of controllable/uncontrollable risks (Williams, 1995).

Degree of Uncertainty: Unpredictable contexts challenge planners necessitating flexibility through iterative approaches (Shenhar & Dvir, 1996).

Industry Type: Distinctions across infrastructure, manufacturing, services influence priorities and control levers (Pinto & Slevin, 1988).

Organization Maturity: Experienced firms better leverage internal competencies offsetting external volatilities (Das & Teng, 2001).

Geopolitical Stability: Political turbulence amplifies impact of disruptions require robust planning under difficult conditions (Yang & Kao, 2012).

2. 6. The Monitoring-Performance Relationship

2.6.1 Prior empirical studies across various sectors and methodologies

Several primary investigations have examined the link between project monitoring rigor and outcomes achieved across industry settings applying diverse analytical techniques:

Construction Sector: Surveys in the US, Canada found positive relation mediated by risk management and stakeholder engagement (Oyedele et al., 2013; Toor & Ogunlana, 2010).

IT Projects: Case studies in Australia and interviews in Iran reported mixed results contingent on skills, resources and change preparedness (Elonen & Artto, 2003; Saadé & Otrakji, 2007).

Manufacturing: Questionnaires across four Asian countries established relationship strengthened by organizational learning promotion (Lee & Espinosa, 2018).

Public Programs: Quasi-experimental design in Norway assessed economic efficiency benefits of oversight and reporting (Fallesen, 2014).

2.6.2 Mixed findings on direct and indirect impact of monitoring

Research suggests monitoring exerts influence both directly and indirectly (Shenhar et al., 1997; Alzoubi & Abdallah, 2018):

Direct effect hypothesis posits tracking progress and taking timely corrective actions optimizes adherence to plans avoiding deviations (Baccarini, 1999). However, the complex, interactive nature of projects necessitates indirect impact arguments better supported by empirical works (Mir & Pinnington, 2014):

Monitoring facilitates improved risk management, stakeholder involvement and scope control which in turn drive performance (Osunruga et al., 2019). It promotes organizational learning enhancing subsequent projects, benefits realization for clients and sponsors (Lee & Espinosa, 2018). Contingent upon situational variables, the strength and nature of relationships may vary substantially (Ahmed & Kangari, 1995).

2.6.3 Moderating role of contextual factors – Industry, Size, Culture

Prior literature identifies drivers moderating monitoring's influence:

Industry Type: Relationship differs between construction, manufacturing due to complexity, regulations involved (Baker et al., 1983).

Project Size: Larger initiatives require elaborate routines for viability versus flexible practices for smaller projects (Wang & Huang, 2006).

Organizational Culture: Collaborative setups better leverage oversight than autocratic hierarchies with compliance mindsets (Mir & Pinnington, 2014).

2.6.4 Knowledge gaps in telecom sectors of developing countries

Empirical literature from telecom infrastructure contexts, especially in developing markets remains scant with opportunities for further research: Impacts of scale, geographical constraints

prevalent in rural connectivity projects necessitating customized oversight (Rysavy Research, 2015). Influence of resource availability limitations on monitoring practices deployable sustainably at scale (Frost & Sullivan, 2021). Roles of agile approaches to address lengthy investment timelines and volatility prevalent in emerging sectors (GSMA, 2020). Effects of socio-political acceptability challenges in sensitive regions on performance moderated by stakeholder inclusion (IFC, 2018).

2.7 Ethiopia's economic development vision and role of technology sector

Ethiopia with a population over 110 million has envisioned transitioning from an agrarian to industrial middle-income economy by 2025 under the Second Growth and Transformation Plan (GTP-II) (NPC, 2016). Accelerated annual GDP growth exceeding 8.5% relies heavily on infrastructure development as an engine.

A key priority sector is Information & Communication Technology (ICT) considered vital for competitiveness, knowledge generation and service delivery enablers. Constructing nationwide digital connectivity featuring high-speed broadband and 5G capabilities holds potentials for catalyzing industrialization, job creation, agriculture productivity and skills development (WorldBank, 2020).

2.7.1 Telecom market liberalization history and operations of Ethio Telecom

Ethiopia's sole telecom operator Ethio Telecom was established in 2009 through corporatization replacing incumbent state-run Telecommunications Services Enterprise. While initially retaining monopoly, the government introduced regulatory and licensing reforms inviting competition under a five-year Growth and Transformation Plan (GTP-I) from 2010 (Gebreeyesus & Iizuka, 2020).

Ethio Telecom continues spearheading nationwide expansion providing fixed and mobile voice/data services to over 50 million subscribers today (EthioTelecom, 2021). Recent accomplishments included 3G/4G network broadening to cover major towns under the state-ownership model with cross-subsidies supporting rural coverage. However, infrastructure backlogs, limited private investment characterized operations.

2.7.2 Challenges faced in managing previous mobile infrastructure projects

Reflecting the scale and complexities involved, Ethio Telecom's mobile network rollouts encountered difficulties requiring enhanced practices:

Multi-year delays were reported in some rural tower installations due to inconsistent site surveys, financing and regulatory clearance processes (Gebreeyesus & Iizuka, 2020).

Quality issues arose from inadequate design documentation, field supervision and asset handover protocols extending maintenance periods (Cherinet, 2018).

Cost overruns occurred attributable to poor contract management, scope changes and underestimated civil works in remote terrains (Andualem & Gebregziabher, 2020).

Vendor coordination faced hurdles coordinating dispersed equipment deployment across the vast landscape and inadequate configuration management systems (EthioTelecom, 2019).

Limited local skills, reliance on expatriate personnel inflated operational expenses reducing viability of subsidized rural services (WorldBank, 2018).

Comprehensive assessments identifying root causes are lacking to optimize strategies supporting future transitions and evolving technological demands.

2.7.3 Knowledge gaps in project management practices for 5G projects

While 5G commercialization is still nascent globally, successful rollouts in least developed settings like Ethiopia necessitate addressing capability gaps:

Applicability of predictive versus agile methods for synchronized multi-operator 5G rollouts over prolonged investment cycles needs validation (GSMA, 2020). Optimization of blended workforce models leveraging scarce specialized skills through digital tools and local capacity development (Vodafone, 2020). Sustainability of remote network management techniques for resilient operations given infrastructure vulnerabilities and service dependencies (Nokia, 2021).

Hybrid tower/small cell siting strategies balancing coverage, capacity and backhaul requirements across varied terrains (Ericsson, 2017). Commercial models marrying universal access

obligations with viable 5G business cases under resource constraints (ITU, 2018). Suitable performance metrics capturing socio-economic impacts beyond traditional measures for infrastructure-led development needs (WorldBank, 2020). Empirically grounded learnings would support telecom reforms amid dynamic technological transitions and fast evolving industrialization imperatives.

2.8 Empirical literature review

This literature review examines the impact of project monitoring and controlling practices on project performance, specifically within the context of 5G network expansion projects.

Project monitoring is the continuous assessment of project progress against pre-defined plans. Studies consistently highlight the positive influence of effective monitoring on project success. Mambo and Chiragu (2013) found a significant correlation between project monitoring and evaluation (M&E) and the performance of road infrastructure projects. Their research suggests that robust monitoring practices enable early identification of deviations from planned schedules, budgets, and quality standards. This allows for timely corrective actions, ultimately improving project outcomes. Similarly, emphasize the contribution of monitoring practices to successful project management in terms of scope, time, cost, and quality.

Project controlling goes beyond monitoring by implementing corrective actions to address identified deviations. Effective controlling practices involve clear performance measurement systems, timely reporting, and proactive decision-making. Research by Adugna (2021) demonstrates the positive association between M&E practices, including controlling activities, and successful project implementation. This highlights the importance of not only identifying issues but also taking concrete steps to rectify them and ensure project goals are met.

The specific context of 5G network expansion projects presents unique challenges. The complexity of these projects, involving new technologies and potentially large geographical areas, necessitates robust monitoring and controlling practices. Existing literature on 5G network deployments is limited, but research on broader infrastructure projects offers valuable insights. For instance, a study by Influence of monitoring practices on projects performance at the water

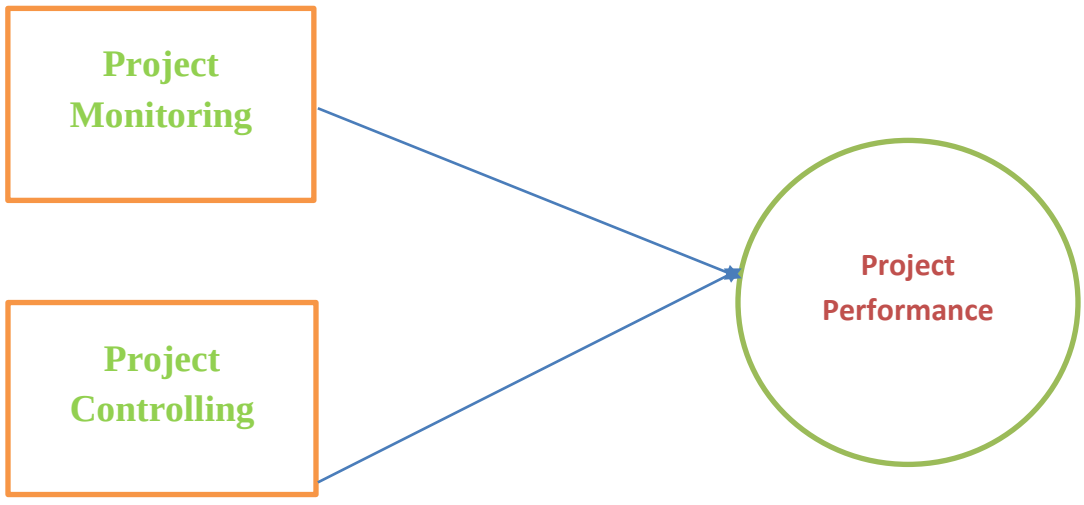
sector trust fund (2018) explores how monitoring can improve project performance in complex infrastructure initiatives.

A comprehensive understanding of the influence of project monitoring and controlling practices on project performance is crucial, particularly for complex undertakings like 5G network deployments. This review highlights the established positive relationship between these practices and successful project outcomes. By investigating these practices within the context of 5G network expansion projects, the research can provide valuable insights for enhancing project performance in this rapidly evolving technological landscape.

2.9 Conceptual Framework of The Study

Based on the reviewed theoretical and empirical literatures, the conceptual framework of the current study is framed as below;

Figure 2.1 Conceptual Framework



Source: Adopted from Adugna (2021) with slight modification

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research Design

Research design, as defined by Creswell (2014), refers a set of procedures for gathering, processing, interpreting, and reporting data in research studies. It aids in the achievement of the research study's goal by recognizing and collecting information on the particular issue that has been found. The development of a successful research design, which demonstrates the conceptual relation between the data gathered, the study, and the conclusions to be drawn, is a crucial part of the research activity.

Since the main objective of the researcher is to determine the effect of project monitoring and controlling factors on project success Explanatory research design will be used. Explanatory research design emphasizes on discovery of ideas, an insight which is especially useful when breaking a broad vague problem statement into a smaller and more precise research question. It is also useful in clarifying concepts and testing measurement methods.

3.2. Data Type and Source

3.2.1 Data Type

Both Primary and secondary data type is used to collect data for the study. Questionnaires and interviews will be used as primary data sources while document review is used as secondary data source.

The primary and secondary sources will help to triangulate data from different perspectives regarding the research problem. The secondary sources of information used to provide the conceptual framework and acquire a general picture of the problem.

3.2.2. Data Source

The primary sources include: 5G network expansion director, 5G network expansion director, program manager, middle level managers and monitoring and controlling experts, by employing

both questionnaire and key informant interview. Secondary data sources include: different records of the organization's: 5G network expansion design Document, 5G network expansion chart, controlling reports, audit reports and monitoring visit reports, which helped the researcher to triangulate the findings of the primary with the secondary data.

3.3. Target population and sample

3.3.1 Target population

The population of the Ethio telecom expansion project are about 206 (permanently dedicated staffs of the project). This means Telecom expansion program has 206 permanent staffs that distributed to run project works of different sites. These project target populations categorized to three teams (project staffs): project run program office had 146 staffs (80 staffs from Addis Ababa and 66 staffs at regional offices) while logistics and contract management program team has 60 staffs both from Addis Ababa and regional sites.

Accordingly, Ethio telecom expansion project structured from Project director to staffs' level. The general project director manages the whole project activities at head office and the activities of the three officers that control each program management and also there are supervisors and staffs for different project activities. There are 206 permanent worker's (population) assigned to run project works of different sites. From these staffs, about 50 percent of the target population found at Addis Ababa project offices.

3.3.2 Sampling and Sampling techniques

As Saunders (2009) explained; non probability sampling provides a range of alternative techniques to select samples based on your subjective judgment. Thus, to determine the sample size subjectively as per the information types gathered, the researcher employed purposive sampling technique. According to Price (2009), purposive sampling is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research. Some types of research design necessitate researchers taking a decision about the individual participants who would be most likely to contribute appropriate data, both in terms of relevance and depth. Purposive

sampling was preferred in this study, and participants were identified as project M&C experts and officers, project managers, project coordinators and project facilitators, top management and middle management. This method is made use of when the members of the entire population do not present same performance, or when the sampling size is very small to represent the entire population efficiently.

3.3.3 Sample size determination

According to Neuman (2006), the question of how large a sample should be depending on the kind of data analysis the researcher plans to use, how accurate the sample has to be for the researchers' purposes and the population characteristics. Because of the nature of the research, the whole employees wouldn't be participant, and the sample population of the study comprised purposely selected target groups from the organization. Accordingly, workers with experience and background with project management in general and project M&C in particular were considered as respondents to the study. The total target populations are 206, samples that comprises M&C expert staffs, supervisors, and managers those were selected purposely to collect primary data via questioner and 5 sample to collect primary data via interview.

The sample size of the study is determined by using the formula developed by Taro Yamane (1967).

Equation

$$\mathbf{n} = \frac{N}{(1+N(e)^2}$$

Where:

The symbol n: represents sample size

N: is the population size

e - is the level of precision or sampling error = (0.05) at 95% confidence interval.

$n=206/1+206(0.05)^2$

$n=206/1.515$

$n=136$

3.4. Data Collection Methods and tools

The main data gathering instruments implemented in the study will be questionnaire, Key Informant Interview and document review.

3.4.1 Questionnaire

Wilkinson and Birmingham (2003) stated that questionnaire is a preferred data gathering tool which enables to effectively collect data in a planned and manageable ways. A survey questionnaire was prepared and administered to TEP program manager, middle level managers, monitoring and evaluation experts. The questionnaire contains closed ended questions since it is an appropriate instrument to obtain variety opinions within a relatively short period of time. Since the media of communication of the international organization is English, the questionnaire was constructed in English. The questionnaire consisted of different parts mainly focusing on the monitoring and evaluation practices and its contribution to project success.

3.4.2 Key Informant Interview

According to Kultar (2007), "an interview is typically defined as face to face discussion or communication via some technology like telephone or computer between an interviewer and respondent". The primary advantage for interview is that they provide much more detailed information than data collected via other data collection methods such as survey, Carolyn and Palena (2006).

The interviewees which include 5G network program manager and middle level managers were selected purposefully based on their depth knowledge in project monitoring and controlling and

program management. Close to 3 individuals will be contacted through telephone and face to face interview.

This helped the researcher to see how monitoring and controlling factors affect the project success. The responses will be captured via note taking and whenever a respondent gives a consent for his/her voice to be recorded, tape recording will be employed. The response will be kept confidential. Thus, the researcher triangulated the findings with the quantitative data collected through questionnaire.

3.5 Data Analysis and Presentation

Data will be evaluated based on the responses from the distributed questionnaire and each response will be administered by applying simple frequency arrangement using appropriate software application like SPSS (Statistical Packages for Social Science) and MS Excel. The researcher will be edited and sorted the questionnaire manually to make sure its completeness and data entry and analysis was performed using SPSS version 24.0. The questionnaires will be collected, coded and entered in to a data entry template. Summary tables and charts will be used for describing data. Regression analysis will be carried out to see the association between each independent variable with the project success variable. Multiple logistic regressions will be performed to identify the most significant predicators by using 95% CI (confidence interval) and P-value (0.05) in order to assess the degree of statistical significance. With regard to the qualitative part, the data was transcribed and translated into English by the researcher. It is then analyzed manually using the thematic analysis and interpretation.

3.6. Validity & Reliability of Data

The significance of the research's component parts is what validity is concerned with. Whether the measurement being done is what is truly intended or the extent to which results gained from the analysis of the data actually represent the phenomenon under study must be taken into account while conducting research on behavior. The questionnaire is also created by looking at related studies done by other researchers in related fields. In addition, relevant professionals and the research advisor was made assess and provide input on the questionnaires. To make sure that the respondents can be able comprehend each item with ease, simple English was employed, and considerable care was taken to make the contents crystal plain and eliminate ambiguity.

Each instrument's variable underwent a reliability examination as well. By calculating the Cronbach's alpha coefficient, the validity of the measurements was evaluated. According to Hair et al. (1998), a construct's Cronbach's alpha coefficient should be 0.7 or higher in order for it to be

scale-acceptable. The value of 0.7 or above indicates that the items in each domain are generally comprehended and considered acceptable by the respondents. On the other hand, if the results are less than the 0.7 predicted value, this may be due to respondents' varied perceptions of the various domain items. Moreover, the validity of the data deployed was tested using factor loading, the criteria for this test demands the loading of each item of a factor to be greater than 0.5.

The Cronbach's alpha coefficient test result revealed that the data is reliable (internally consistent) as the Cronbach's alpha coefficient value for each variable is greater than 0.70. The reliability test and validity test result are presented in the table 4.1 below.

	Number of Items	**Cronbach's alpha coefficient**
Project monitoring	5	.820
Project control	5	.822
Project performance	5	.774

Table 4.1 Reliability and Validity Test Result

3.7 Ethical Consideration

The researcher will follow ethically and morally acceptable processes throughout the research process. The data will be collected with the full consent of the participants. In this regard, the names of the respondents not be disclosed and Information will not be available to anyone who is not directly involved in the study. In order to safeguard the rights of the participants, the researcher will explain the benefits of the study to the participant. In addition, the researcher will use proper citation, follow truthful collection & analysis of data, maintained data confidentiality, obtained the consent of the case organization and staffs and keep the identity of respondents unanimous based on their consent to meet the ethical obligations of the research.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1. Introduction

The study's findings, their interpretation, and the discussions that followed are all included in this chapter. The survey results regarding the respondents' demographics are shown in the first section of the chapter. The findings and discussion of the descriptive statistics analysis are presented in the second section of the chapter, and the results and discussion of the inferential statistics analysis are presented in the third section.

4.2. Questionnaire Response Rate

136 questionnaires that were distributed to participants in this study out of which 128 questionnaires were collected back. As a result, the study's response rate of 94.0 percent is sufficient to produce reliable study results.

4.3 Demographic Characteristics of Respondents

Researchers can better understand the variation among respondents with regard to the major demographic variables by analyzing the demographic data provided by the respondents. As a result, the goal of this section was to outline the study participants' demographics in terms of their sex, age, level of education, employment status, and years of experience.

4.3.1 Distribution of Respondents by Gender

The table below shows that the sex distribution of participants. The sample is predominantly male, with males making up 79.7% of the respondents, while females constitute 20.3%. Understanding the perspectives of both men and women involved in project monitoring and control is crucial for effective decision-making.

Table 4.1 Sex of the respondents

		Frequency	Percent
Valid	Male	102	79.7
	Female	26	20.3
	Total	128	100.0

Source: own survey, 2024

4.3.2 Distribution of Respondents by Age

The table shows the age distribution of the participants planned for a study. The majority of participants (62.5%) fall in the 18-30 age group. Another 16.4% are between 31 and 40 years old. In total, 78.9% of participants are younger than 41. There is a smaller representation of participants in the 41-50 (6.3%) and over 50 (14.8%) age groups. The project management field might tend to attract younger professionals. Younger professionals might be more available to participate in research studies compared to those with more work or family commitments.

Table 4.2 Age of the Respondents

		Frequency	Percent
Valid	18-30	80	62.5
	31-40	21	16.4
	41-50	8	6.3
	>50	19	14.8
	Total	128	100.0

Source: own survey, 2024

4.3.3 Distribution of Respondents by Educational Background

The table indicates the educational background distribution of the 128 participants planned for a study. The majority of participants have a university degree, with 43.0% holding a first degree and 29.7% holding a second degree, totaling 72.7%. A significant portion of participants (22.7%) hold a diploma, indicating a skilled workforce with relevant technical or vocational training. Only a small percentage (4.7%) have a secondary school education only. The educational background distribution suggests a focus on professionals with college-level education or higher.

Job requirements for project monitoring and control roles in a telecommunication project likely require at least a diploma or university degree.

Table 4.3 Educational Background of the respondents

		Frequency	Percent
Valid	Secondary	6	4.7
	Diploma	29	22.7
	First Degree	55	43.0
	Second degree	38	29.7
	Total	128	100.0

Source: own survey, 2024

4.3.4 Distribution of Respondents by work experience

The table shows the work experience distribution of the participants. The majority of participants (45.3%) have between 2 and 5 years of experience. Another 16.4% have 6 to 10 years of experience, suggesting a focus on mid-career professionals. The study also includes participants with less experience (<2 years: 22.7%) and more experience (>10 years: 15.6%). The work experience distribution shows the project at a stage where mid-career professionals with some experiences are most in demand. The recruitment strategy might have targeted professionals with a specific range of experience, emphasizing a focus on mid-career professionals.

Table 4.4 Work experience of the respondents

		Frequency	Percent
Valid	<2 years	29	22.7
	2-5	58	45.3
	6-10	21	16.4
	> 10	20	15.6
	Total	128	100.0

Source: own survey, 2024

4.3.5 Distribution of Respondents by job position

The table illustrates the job position distribution of the sample participants. The vast majority of participants (79.7%) are categorized as officers/experts, suggesting a focus on individual contributors who likely play a key role in project execution and monitoring. There is also representation from management positions, including heads of project offices (3.9%), department heads (7.8%), and team leaders (8.6%). This allows for capturing insights from various levels of the project hierarchy. The current distribution has strengths in capturing the perspectives of those directly involved in project monitoring and control (officers/experts) while also including some management positions for a broader view. Ensuring a good balance between different levels (officer/expert vs. management) is crucial to get a comprehensive understanding. The job position distribution seems appropriate for a study focused on project monitoring and controlling practices.

Table 4.5 Job position of the respondents

		Frequency	Percent
Valid	Head of project office	5	3.9
	Department Head	10	7.8
	Team leaders	11	8.6
	Officer/Expert	102	79.7
	Total	128	100.0

Source: own survey, 2024

4.3. Descriptive Statistics Analysis

To get the respondents' opinions on the variables incorporated in this study and to evaluate each statement that fell under a different construct, Likert's five-point rating system was used. Based on this metric, each statement under the various constructs is assigned a score ranging from 1 to 5. In this regard, the scales 1, 2, 3, 4, and 5 represent the respondent's perception of a statement as very disagree, disagree, neutral, agree, and very agree, respectively. Therefore, the mean score value for each statement under the various constructs will be used to calculate the respondents' overall perception. Consequently, the mean score value of the respondents' overall perception will be interpreted as follows: Disagree to 1.80–1.60, neutral to 2.60–3.40, agree to 3.40–4.20, and very agree to 4.20–500.

4.3.1 Project Monitoring Practice

The table summarizes the responses from 128 participants on their perceptions of project monitoring practices. All statements are measured on a scale where 1 represents "strongly disagree" and 4 represents "strongly agree." The findings indicate a generally positive perception of project monitoring practices, with all statements averaging between 3.74 and 3.92, leaning towards agree. Participants show a good agreement that the project team regularly gathers data on progress compared to the baseline plan (Mean: 3.80). There is a strong agreement that clear performance indicators exist to track the program's progress (Mean: 3.92). The consensus is that project deviations are identified and reported promptly (Mean: 3.85). Effective communication of progress reports to stakeholders is also agreed upon (Mean: 3.91). However, there is slightly less agreement on the established processes for analyzing project data and identifying potential risks (Mean: 3.74), suggesting room for improvement in this area. Overall, the findings suggest a well-established project monitoring system in place, with regular data collection, clear performance indicators, and timely reporting of deviations. However, enhancing data analysis processes to identify potential risks could further improve the monitoring practices.

Table 4.6 Respondents Perception on the Practice of Project Monitoring

Statements	N	Mean	Std. Dev
The project team regularly collects data on project progress against the baseline plan (schedule, budget, etc.).	128	3.80	.873
Clear performance indicators are defined to track the progress of the 5G network expansion program.	128	3.92	.936
Project deviations (delays, cost overruns, etc.) are identified and reported promptly.	128	3.85	.870
Regular progress reports are communicated effectively to all project stakeholders.	128	3.91	.943
There are established processes for analyzing project data and identifying potential risks.	128	3.74	.898

Source: own survey, 2024

4.3.2 PROJECT CONTROL PRACTICE

The findings indicate a very positive perception of project control practices, with all statements averaging between 4.33 and 4.50, leaning towards strongly agree. There is strong agreement that corrective actions are implemented effectively to address project deviations (Mean: 4.37). Participants largely agree that project schedules and budgets are promptly updated to reflect changes (Mean: 4.37). There is a strong consensus that risk mitigation strategies are developed and implemented (Mean: 4.33). Participants strongly agree that project resources are managed efficiently (Mean: 4.45). The highest average score is for the statement on clear decision-making procedures for addressing project issues (Mean: 4.50), indicating very strong agreement. The findings suggest a highly effective project control system in place. The project team appears adept at addressing deviations, updating plans, mitigating risks, managing resources efficiently, and making clear decisions. These strengths in project control practices contribute to a well-controlled project environment, likely leading to successful project performance.

Table 4.7 The Respondents Perception on Project control practice

Statements	N	Mean	Std. Dev
The 5G network expansion program is on track to meet its planned completion date.	128	3.78	.988
The project is being delivered within the approved budget.	128	4.13	.767
The quality of the 5G network infrastructure meets the established standards.	128	4.10	.912
Project stakeholders are satisfied with the overall progress of the 5G network expansion program.	128	4.22	.720
The project is achieving its intended objectives (improved network coverage, capacity, etc.).	124	4.19	.793

Source: own survey, 2024

4.3.3 Project Performance

The table indicates that the picture of project performance. There is slight agreement that the project is on track for completion by the planned date (Mean: 3.78), which is the lowest score among the statements. Participants largely agree that the project is being delivered within the

approved budget (Mean: 4.13). There is consensus that the quality of the network infrastructure meets established standards (Mean: 4.10). Stakeholders are generally satisfied with the overall progress of the 5G network expansion program (Mean: 4.22). There is slight agreement that the project is achieving its intended goals, such as improved network coverage and capacity (Mean: 4.19). However, this statement has a lower sample size (N=124) compared to others (N=128). The project seems to be within budget, delivering high-quality infrastructure, and satisfying stakeholders. However, there might be some concerns regarding meeting the planned completion date and achieving all objectives. Investigating the reasons for the lower score on meeting the planned completion date and the challenges hindering the achievement of all project objectives could lead to corrective actions. Ensuring the program delivers high-quality infrastructure within budget while meeting its intended goals and timeline would enhance overall project performance. While project control practices seem very effective, there might be room for improvement in schedule management to ensure on-time completion. Overall, the findings suggest a well-managed project with positive control practices and stakeholder satisfaction.

Table 4.8 The Respondents Perception on Project Performance

Statements	**N**	**Mean**	**Std. Dev**
The 5G network expansion program is on track to meet its planned completion date.	128	3.78	.988
The project is being delivered within the approved budget.	128	4.13	.767
The quality of the 5G network infrastructure meets the established standards.	128	4.10	.912
Project stakeholders are satisfied with the overall progress of the 5G network expansion program.	128	4.22	.720
The project is achieving its intended objectives (improved network coverage, capacity, etc.).	124	4.19	.793

Source: own survey, 2024

4.5 Inferential Statistics Analysis

Inferential statistics allow researchers to infer about the total population based on sample data. Thus, both correlation and regression analysis were done in this section. The former was

conducted to see the degree and direction of the connotation between variables included in the study, while the later was used to examine the magnitude and direction of the effect of the independent variables on the dependent variable.

4.5.1 Correlation Analysis

Pearson correlation coefficient (r) was used to estimate the association between the study variables. As a consequence, the correlation analysis revealed that the dependent variable and the explanatory factors have a substantial positive connection. As a result, at the 1% significant level, project performance was found to have a strong and positive relationship with project monitoring practice and project control practice with correlation coefficients r=.731, and r=.512, respectively. The result confirmed that there exists a strong association between project performance and, project monitoring practice and project control practice.

Table 4.11 Correlation Analysis Result

		PRM	PRC	PRPR
PRM	Pearson Correlation	1	.399**	.731**
PRC	Pearson Correlation		1	.512**
PRPR	Pearson Correlation		.	1
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: own survey, 2024

4.5.2 Regression Analysis

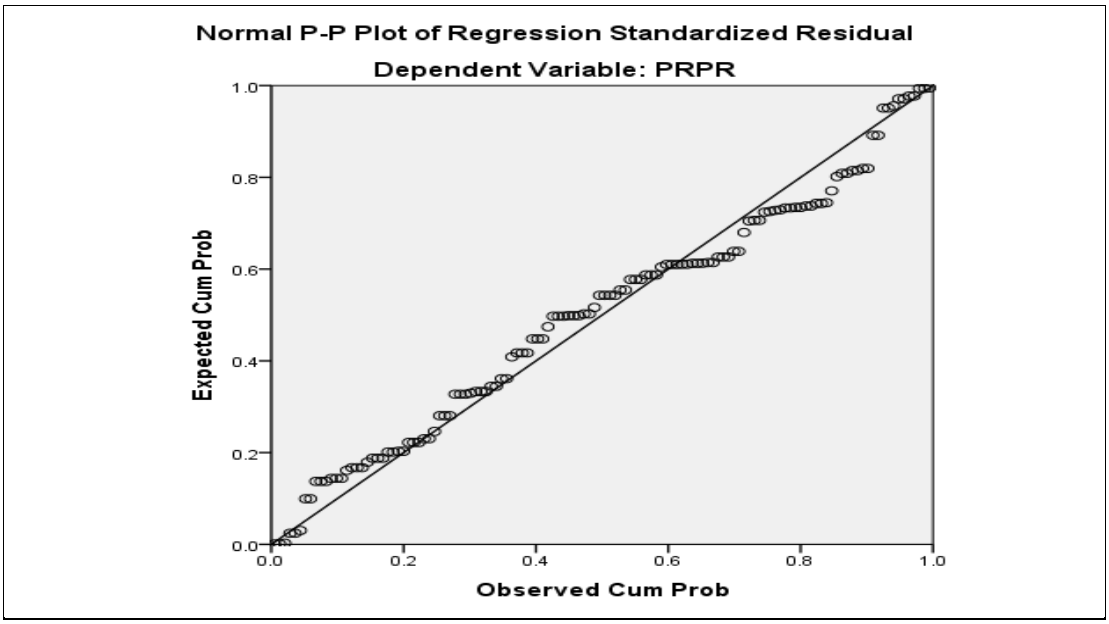
Researchers can use regression analysis to examine the amount and direction of the effect of independent factors and the dependent variable. In the regression analysis technique, this study used multiple linear regression using ordinary least squares (OLS). However, in order to use the ordinary least squares (OLS) technique in regression analysis, the data used in the econometric model must meet the five OLS assumptions. A breach of one of these assumptions may result in an erroneous regression result. As a result, the diagnosis tests were carried out in order to avoid erroneous regression results. The model passed all of the diagnostic tests, including

heteroscedasticity, multicollinearity, linearity, and normalcy. Because serial correlation is only a potential hazard for time series data and not cross-sectional data, such a test was not required for this investigation.

4.5.2.1 Diagnosis Test Result

i. Linearity

Figure 4.1: Test of Linearity



Source: own survey, 2024

To use multiple regression with ordinary least squares (OLS), the connection between the dependent and independent variables must be linear. Among the different ways of assessing linearity used in this study, a scatter plot diagram with a line of fit was used to determine whether the connection is linear.

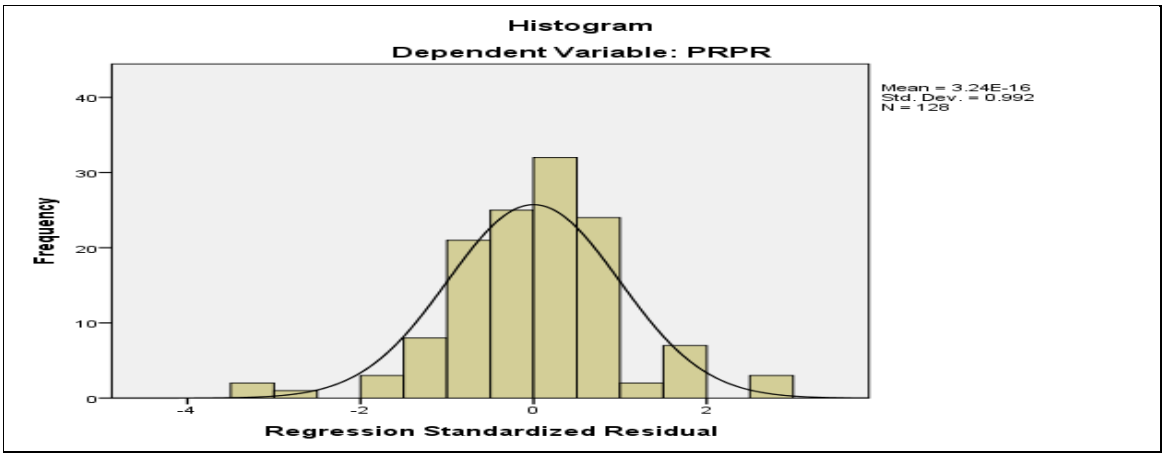
The scatter plot diagram with line of fit result confirmed the existence of a linear connection between the dependent variable and those independent factors.

ii. **Normality**

The sample data comes from a regularly distributed population, which is one of the assumptions made in multiple regression analysis using the ordinary least squares (OLS) approach. Because

mistakes are normally distributed, a plot of residual values will approximate a normal curve (Keith, 2006). In this study, the histogram of standardized residuals was used to test data normality. The data used for this investigation were from a regularly distributed population, as seen in the histogram above, indicating that the assumption of normality was met.

Figure 4.2 Test of Normality



Source: own survey, 2024

iii. Multicollinearity

Multicollinearity is caused by the inclusion of irrelevant variables. The regression analysis was used to perform a collinearity diagnostic test. Multicollinearity is typically detected using the variance inflation factor (VIF). A VIF greater than 10 generally implies a multicollinearity concern. A look at VIF for variables in our model revealed that multicollinearity was not a concern.

Table 4.16 Test of Multicollinearity

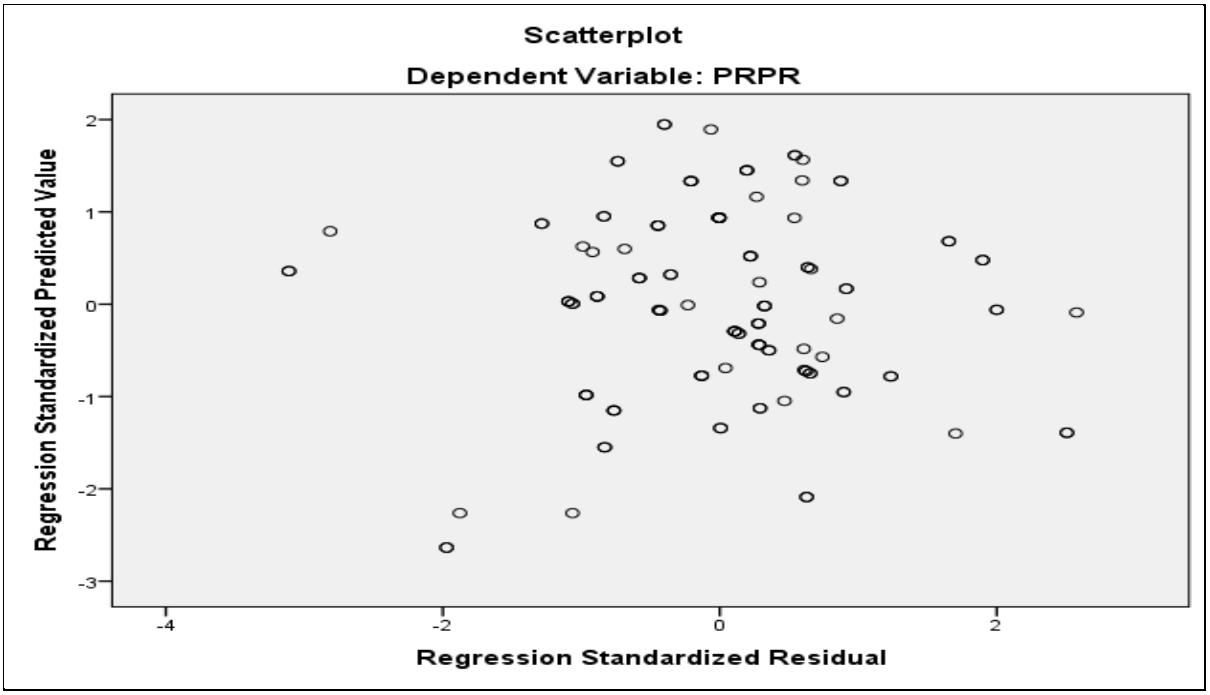
Model	Collinearity Statistics	
	Tolerance	VIF
PRM	.841	1.189
PRC	.841	1.189
a. Dependent Variable: PROJPRF		

Source: own survey, 2024

iv. Homoscedasticity

This assumption asserts that every disturbance has the same variance, the amount of which is unknown, meaning that the error term's (disturbance's) dispersion is the same regardless of size. When this assumption is broken, we have the case of heteroscedasticity. Heteroscedasticity is common in cross-sectional data. According to the test result, the standardized residuals are evenly distributed, indicating that the data does not have a heteroscedasticity problem.

Figure 4.3 Test of heteroscedasticity



Source: own survey, 2024

4.5.2.2 Regression Analysis Result

The primary goal of this research is to investigate the effect of project monitoring practice and project control practice on project performance. As a result, multiple linear regressions analysis using the ordinary least squares (OLS) technique was useful in meeting this goal. This method is useful for analyzing the effect of two or more explanatory variables on the dependent variable. In the regression analysis, servant and spiritual leadership styles are the two independent variables.

While project performance was the dependent variable. The result of the regression analysis result was presented below as follows;

4.5.2.2.1 Model Summery and ANOVA

Table 4.17 shows the model's summary results. As a result, the adjusted R-squared value in the model summery equals 0.586, meaning that the two dependent variables integrated in the model explain 59 percent of the variation in project performance, while the remaining 41 percent of the variation on project performance is explained by the variation factors other than these two explanatory variables which are not captured in our model.

Table 4.17 Model Summery

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.769[a]	.592	.586	.36873
a. Predictors: (Constant), PRC, PRM				
b. Dependent Variable: PRPR				

Source: own survey, 2024

Table 4.18 shows the ANOVA results, which confirm that at least one of the dependent factors has a statistically significant effect on the dependent variable. The model, on the other hand, is fit to the set of data deployed in the model with F test=90.701 (p-value=0.000 <1%).

Table 4.18 Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	24.665	2	12.332	90.701	.000[b]
	Residual	16.996	125	.136		
	Total	41.660	127			
a. Dependent Variable: PRPR						
b. Predictors: (Constant), PRC, PRM						

Source: own survey, 2024

Multiple linear regression analysis using the ordinary least squares (OLS) technique was used to estimate the magnitude and direction of each independent variable's effect on the dependent variable. The value of the elasticity coefficient or Beta coefficient reveals the magnitude of each independent variable's effect on the dependent variable, while the sign of the beta coefficient indicates the direction of the effect. The level of significance of each independent variable's effect on the dependent variable is reflected in the P-value. As a consequence, the estimated results of the regression analysis revealed that both of the two independent variables have a statistically significant positive effect on the dependent variables. The detailed outcome of the regression analysis is shown below.

As shown in table 4.19, among the two independent variables, project monitoring practice is found to have statistically significant positive effect on the dependent variable (project performance) at 1 percent level of significance and with beta coefficient (β=.702). This finding can be interpreted as the practice of project monitoring improved by a unit, project performance will be improved by 0.702 units, other things remain unchanged. This finding is in agreement with the findings of Mambo and Chiragu (2013) and Hwang and Lim (2013). On the other hand, the finding of the regression analysis showed that project control practice has statistically significant positive effect on project performance in the case project with beta coefficient (β=.285) at 1 percent level of significant. The interpretation is that a unit improvement in the practice of project control causes 0.285 units improvement on project performance. This finding is in agreement with the findings of Adugna (2021).

Table 4.19 the multiple regression analysis result

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.012	.317		.038	.969
	PRM	.702	.070	.626	10.049	.000
	PRC	.285	.068	.263	4.217	.000
a. Dependent Variable: PRPR						

Source: own survey, 2024

CHAPTER FIVE

Summary of Findings, Conclusion and Recommendations

This chapter of the study included an overview of the key findings, a conclusion drawn from the study findings that are in line with the objective of the study and recommendations forwarded by the researcher based on the study findings and conclusions drawn.

5.1 Summary of major Findings

Examining the effect of project monitoring practice and project control practice on project performance in the case of 5G network expansion program in Ethio telecom was the study's main goal. A combination of explanatory and descriptive research designs, along with a quantitative research approach, were used to achieve the study's intended goal. 136 sample respondents were selected using convenance sampling technique. Primary cross-sectional data were used in the study, and a structured survey questionnaire was used to collect data. The deployed data was analyzed using regression analysis using OLS technique and descriptive statistics.

This study employed the most popular reliability test technique, Cronbach's Alpha coefficient, to guarantee the dependability of the deployed data. The Cronbach's Alpha coefficient test result thus verified the validity of the data used in this investigation.

The survey achieved a high response rate of 94.0%. The majority of respondents were male (79.7%) and fell within the 18-30 age group (62.5%). Most participants have a college-level education (72.7%) and between 2-5 years of work experience (45.3%). Officers/Experts comprised the largest group of respondents (79.7%), indicating a focus on those directly involved in project monitoring and control.

Project monitoring practices were generally perceived positively, with aspects like data collection and progress reporting showing strong agreement. However, there is room for improvement in analyzing project data to identify potential risks. Project control practices received very positive feedback, with all statements averaging between 4.33 and 4.50, indicating clear decision-making, effective corrective actions, and efficient resource management. The

project seems to be within budget and delivering high-quality infrastructure, but there might be concerns regarding meeting the planned completion date and achieving all objectives.

Correlation analysis revealed a strong positive relationship between project performance and both project monitoring practice (r = 0.731) and project control practice (r = 0.512). Regression analysis confirmed that both project monitoring practices and project control practices have statistically significant positive effects on project performance.

5.2 Conclusion

Based on the findings of the study the following conclusions are drawn;

- The study finding confirmed that project monitoring practice has statistically significant positive influence on project success. Therefore, it is concluded that project monitoring practice implemented in 5G expansion project of Ethio-telecom has significant positive contribution on the performance the 5G expansion project.
- As suggested by the study finding project controlling practice has statistically significant positive influence on project success. Therefore, it is concluded that project controlling practice implemented in 5G expansion project of Ethio-telecom has significant positive contribution on the performance the 5G expansion project.
- Based on the study findings suggestions, it could be concluded that well-established project monitoring and control practices are in place, contributing to a positive perception of project performance in 5G expansion project of Ethio-telecom.
- It is also concluded that, while strengths were identified in data collection, reporting, corrective actions, and resource management, analyzing project data to identify potential risks and ensuring on-time completion could be improved.

5.3 Recommendations

Based on the major findings of the study and conclusion drawn based on the findings, the following recommendations are forwarded by the researcher.

- The project management of 5G expansion project of Ethio-telecom should enhance the process for analyzing project data to proactively identify and mitigate potential risks.

- The project management of 5G expansion project of Ethio-telecom should implement strategies to address any delays that might hinder meeting the planned completion date.
- The project management of 5G expansion project of Ethio-telecom should clearly define project objectives and ensure effective communication to maintain stakeholder satisfaction.
- The study suggests that in order to provide administration and the key players in a continuous improvement initiative with intercession, monitoring and controlling should be an ongoing endeavor that makes use of systematic information gathering.
- For projects to be successful, the study advises management to support stakeholders at all levels.

5.4 Direction for future studies

The current study is delimited in examining the effect of project monitoring and controlling Future research should practices on project performance in the case of 5G expansion project of Ethio-telecom. Therefore, future studies should;

- Investigate the reasons behind potential delays and challenges in achieving all project objectives.
- Explore the impact of leadership styles on project monitoring and control practices.
- Conduct a comparative study to analyze the effectiveness of project monitoring and control practices across different industries.

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APPENDIX

ST. MARY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PROJECT MANAGEMENT

Research Questionnaire

The purpose of this questionnaire is to obtain data for a research project to be conducted on the topic "The effect of project monitoring and controlling practice on project performance of 5G network expansion program in Ethio telecom", in partial fulfillment of the requirements for the award of MSC Degree in project management.

Your cooperation in filling out the questionnaire carefully and genuinely, therefore will not contribute towards reasonable output in the study. The researcher, in this regard, assure you that it is not a test of your ability; and all the information you provide will be confidential & is to be used only for research purpose.

Thank you!

Part I: Demographic information

1. Gender of respondents: 1. Male ☐ 2. Female ☐

Age of respondents: 1. 18-30 ☐ 2. 31-40 ☐ 3. 41-50 ☐ 4. Above 50 ☐

2.Highest level of educational of respondents: 1. Elementary ☐ 2. Secondary ☐ 3. Diploma ☐ 4. First degree ☐ 5. Second degree ☐

3.Respondents Work Experience in the job

1. Less than 2 years ☐ 2. 2-5 years ☐ 3. 6-10 years ☐ 4. Above 10 years ☐

5.

5.Level of position

1. Middle level manager ☐

2. Senior expert ☐

3. Junior expert ☐

Part II: Questionnaire: The Effect of Project Monitoring and Controlling Practices on Project Performance (5G Network Expansion Program, Ethio Telecom)

Introduction:

Thank you for participating in this survey. This questionnaire aims to understand the relationship between project monitoring and controlling practices and project performance in Ethio Telecom's 5G network expansion program. Your honest responses are highly valued and will remain confidential.

Scale:

Please use the following scale to indicate your level of agreement with each statement:

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

Project Monitoring Practices

No						
	Statements	**1**	**2**	**3**	**4**	**5**
1	The project team regularly collects data on project progress against the baseline plan (schedule, budget, etc.).					
2	Clear performance indicators are defined to track the progress of the 5G network expansion program.					
3	Project deviations (delays, cost overruns, etc.) are identified and reported promptly.					
4	Regular progress reports are communicated effectively to all project stakeholders.					
5	There are established processes for analyzing project data and identifying potential risks.					

Project Control Practices

No						
	Statements	**1**	**2**	**3**	**4**	**5**
1	Corrective actions are implemented effectively to address identified project deviations.					
2	Project schedules and budgets are updated promptly to reflect changes in the project environment.					
3	Risk mitigation strategies are developed and implemented to minimize project risks.					
4	Project resources (personnel, equipment, etc.) are managed efficiently.					
5	There are clear decision-making procedures for addressing project issues and challenges.					

Project Performance

The 5G network expansion program is on track to meet its planned completion date.

The project is being delivered within the approved budget.

The quality of the 5G network infrastructure meets the established standards.

Project stakeholders are satisfied with the overall progress of the 5G network expansion program.

The project is achieving its intended objectives (improved network coverage, capacity, etc.).

No						
	Statements	**1**	**2**	**3**	**4**	**5**
1	The 5G network expansion program is on track to meet its planned completion date.					
2	The project is being delivered within the approved budget.					
3	The quality of the 5G network infrastructure meets the established standards.					
4	Project stakeholders are satisfied with the overall progress of the 5G network expansion program.					
5	The project is achieving its intended objectives (improved network coverage, capacity, etc.).					

Thank you for your participation!