



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

IMPACT OF PROJECT COMMUNICATION ON PROJECT
SUCCESS WITH MEDIATION ROLE OF PROJECT MANAGERS'
COMPETENCY AND MODERATION OF SENIOR MANAGERMENTS
SUPPORT: THE CASE OF HIGH VOLTAGE POWER
TRANSMISSION AND SUBSTATION PROJECTS IN ETHIOPIAN
ELECTRIC POWER.

BY: WONDWOSSEN ABATE

JANUARY 2024
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DECLARATION

I declare that the study entitled “*Impact of project communication on project success with mediation role of project managers’ competency and moderation of senior managements support: the case of high voltage power transmission and substation projects in Ethiopian Electric Power*” is my original work. This paper has not been submitted for any degree in any university and that all sources of material used for the thesis have been duly acknowledged.

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ACKNOWLEDGMENT

I would like to extend my sincere gratitude to my advisor Mahir J. (PhD) for his invaluable suggestions and comments throughout this study, as well as his positive outlook. Additionally, I would like to express my thanks to all those who generously contributed data for this study.

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ACRONYMS

EEP: Ethiopian Electric Power

HVPTSP: High Voltage Power Transmission Substation Project

KV: Kilo Volts

PMBOK: Project Management Body Of Knowledge

IPMA: International Project Management Association

APM: Association of Project Management

PMCD: Project Managers Competency Development

ABSTRACT

Good and efficient project communication practice and use of suitable communication techniques plays vital role for the success of projects. However, barriers of project communication contribute to the ineffectiveness of communications which influence the project activities negatively. The emphasis of senior managements in supporting projects and competency level of project managers in leading and executing the project tasks has significant influence to the success of projects. This study focus on impact of project communication practice, project communication technique and project communication barriers on project success with the mediating role of project managers' competency and moderating role of senior managements support in HVPTSPs of EEP. And the explanatory and quantitative research was used in this study. Primary data were collected from the project clients, consultants or engineers and contractors using the structured questionnaires using Likert scale. 265 questionnaires were distributed to the population of the study and 230 questionnaires were gathered, that made the response rate to be 86.8%. The data were analyzed using both the inferential and descriptive methods by SPSS version 27 statistical software and process macro tools version 4.2 by Andrew F. Hayes. The findings of the study indicate that project communication practice and project communication techniques have the positive significant impact on the success of the projects. However, project communication barriers have negative significant effect on project success. In addition, the result of the study indicated that mediator variable 'project managers' competency' and moderator 'senior managements' support' significantly influence the impact of project communication practice, techniques and barriers on project success. Hence the study recommends enhancing project communication practice and techniques, developing the competency level of project managers, increasing the support of senior managements and reducing communication barriers helps to increase the success rate of HVPTSPs in EEP.

Keywords: *Project communication practice, project communication techniques, project communication barriers, project managers' competency, senior managements support, project success.*

Chapter 1 : Introduction

1.1 Background of the study

Communication is the means of disseminating and receiving information through the events such as meetings and presentation, or artifacts like emails, social media, project reports, or project documentation (PMBOK, 2017). Communication made sharing of ideas and giving instructions from one individual to another possible. In order to fulfil project objectives, good communication among project participants raises the level of comprehension (Abdullahi et al., 2021).

Projects are the means to fulfil organizational goals and project managers need to communicate with the internal and external stakeholders of the project to set project goals and share project responsibilities. And timely and effectively communication with the team members of the project is important for the project manager to insure keep track of the project goals (Rodríguez, 2017).

Communication is essential to achieving project goals because it keeps team members, stakeholders, and management informed and on track while also helping to spot challenges, risk, and delusions that could prevent project success (Rodríguez, 2017; Sean & Li, 2018). Moreover, it encourages participation, cooperation and idea sharing from all project participants. And the project members are kept informed of its development through regular communication which help to improve the work morale due to the feeling of being involved in the decision making process of the project (Rodríguez, 2017).

Majority of a project manager's time is spent communicating with the project team and other stakeholders, both inside and outside the organization. Diverse stakeholders with various

organizational and cultural backgrounds, levels of competence, viewpoints, and interests are managed effectively through communication (PMBOK, 2017).

Project team members need to disseminate relevant and appropriate information to the target person or group in all stages of the project lifecycle in organized way according to the project specification or requirement on schedule and within the budget to meet the project objectives. And the use of an applicable communication methods and channels is vital for efficient and effective information and message transfer (Sean & Li, 2018).

In the process of project management, effective communication with stakeholders is needed in the area of cost, scope and time and quality. And communication is the function that integrates cost, scope and time to achieve a quality product which are the cornerstone of project success(Zulch, 2014). And according to (PMBOK, 2017) communication develops the relationships necessary for successful project and program outcomes.

Electric power is the main pillar supporting the nation's growth & development and a reliable energy is key to achieving sustainable economic as it is a critical input into all sectors of the economy. Ethiopian government growth and transformation plan, increase in the industrialization, growth in the number of population and shifting from the traditional energy to the electric due to more urbanization have increased the demand for electric power significantly. And to meet these demands Ethiopian Electric Power (EEP) is implementing high voltage transmission and substation projects (HVTSP) range from 132 to 400 kilo volts (KV) across the country. EEP is implementing the high voltage transmission and substation projects on the basis of turnkey and supply only contracts. And currently, there are projects of different high voltage transmission and substation projects of construction cost of more than 300 Million united state dollars which are implemented under Ethiopian Electric power

company. And the completion of HVPTSP within the project success constraints of time, scope and quality has substantial impact in achieving the return on the investment through sales of electricity and critical to the end users developmental goal.

Project success can be measured on the triple constraints of time, cost and quality and represent the key performance indicators of the project. To evaluate whether the projects' effective implementation and success there is a need to investigate the initial project objective of schedule, cost and quality to measure the extent of the achievement (Kimutai, 2018).

In addition, the project success might include criteria linked to the organizational strategy and delivery of business results. Moreover; the project success is measured through achievement of financial benefit like return on investment and non financial outcomes such as fulfilling contract terms and conditions, meeting organizational strategic objectives, integration of project deliverables into the organization's operating environment and etc. (PMBOK, 2017).

In construction projects, project managers need to communicate efficiently on project triple constraints of the projects for successful execution and achieving the desired project deliverables. Hence, efficient project communication lead to the effective project management which in turn impact project success significantly (Zulch, 2014). In addition, the nature of construction projects requires effective and coordinated communication among the various stakeholders the research findings indicated that project communication planning influence the project success significantly (Setiawan et al., 2021).

On the other side, failure to achieve the preconceived goal of construction projects is linked to the infective communication among project team members (Yakubu et al., 2019). Construction sector encounters numerous problems throughout the project's lifecycle and

besides these challenges poor communication is an added complication which can result in project failure or at least time and cost overruns (Sean & Li, 2018; Suleiman, 2022). In addition, ineffective communication and poor communication skills result in project outcomes that fall short of the project's objectives (Zulch, 2014).

Project communication management plays significant role on implementation of complex projects that require enormous exchange information among the teams of various profession and stakeholders internal and external to the project and the organizations. And hence, this study tries to assess the effects of project communication on the success of high voltage transmission and substation electric power transmission projects in Ethiopian electric power.

1.2 Statement of the problem

Complexity of construction projects have increased substantially and demand more expertise and significant number of peoples' involvement in the modern day of construction business (Malik et al., 2021). And they are characterized by varied organizational structures and delivery techniques that are distinctive in that they are initiated and executed to satisfy the needs of particular owners. Hence, it is critical to carefully plan communication with involvement of all project stakeholders and establish clear expectations for the success of the project. Moreover, construction parties must communicate in order to achieve a shared knowledge of the project deliverables and contract conditions (Yakubu et al., 2019).

According to the indications discussed in the trends of project managements practice of EEP, the causes of project cost and time overrun which are the measures of project successes or failures are associated with other internal and external factors and financial budget limitations (EEP, 2020). However, studies (Sperling et al., 2008) indicated that efficient

communication with the stakeholders of construction projects is one of the significant factor for the success of projects and (Suleiman, 2022) indicated that the timely dissemination of project information play substantial role for the project success. And communication plays a central role in construction projects, where project managers dedicate approximately 90% of their time engaging with project participants. (Usanase & Nkechi, 2022).

Moreover, research findings on the construction sector indicate that inadequate project documentation and information transfer and storage will occur in a project as a result of poor communication. And project parties must create consistent and permanent communication channels with all stakeholders to facilitate project communication (Suleiman, 2022). Besides, scheduled review and regular update of project communication plan is important for the project success. In addition, communication barriers can be overcome by holding project meetings and developing communication procedures early in the project's life cycle. (Sean & Li, 2018).

Studies done by (S.senyange et al., 2017) indicated that to ensure and sustain project success, project implementers must maintain outstanding communication with all project participants and stakeholders on project activities. And in order to achieve the best project success, solid internal communication structures and processes must be established to assist stakeholders in carrying out their roles.

Besides, the study (L. Chen, 2023) conducted on the construction projects indicted that project managerial capacity mediates the effect of project communication on the project performance. Moreover, it showed also that project communication capacity affect the project managerial capacity. Furthermore, research done (H. L. Chen, 2021) on impact of communication on capital project performance indicated that project technical and managerial competency mediates the impact of project communication on project performances. And in

the implementation of projects, the support of senior management has significant effect on the success of the projects (Ahmed et al., 2022).

Therefore, this study tried to investigate the impact of project communication management on the success of high voltage power transmission and substation project of Ethiopian Electric Power with mediation of project manager's competency and moderation role of senior managements support.

1.3 Research Questions

The study for this project thesis aims to provide answers to the following research questions.

- How does the project communication practice impact the success of HVPTSPs in EEP?
- How does project communication technique influence the success of HVPTSPs in EEP?
- How does project communication barriers affect the success of HVPTSPs in EEP?
- Does project manager's competency mediate the relationship between project communication and success of HVPTSPs in EEP?
- Does senior managements' support moderate the relation of project communication on the success of HVPTSPs in EEP?
- How does the relationship of project communication practice, techniques and barriers with the project success be affected with the mediation of project manager's competency and moderation of senior management support in HVPTSPs of EEP?

1.4 Research Objectives

1.4.1 General objective

The general objective of the study is to analyze the impact of project communication on the success of HVPTSPs in EEP via the mediation of project managers' competency and moderation of senior managements support.

1.4.2 Specific objective

The followings are the specific objectives of the research project to be covered in this study.

- To assess how the project communication practice impact the success of HVPTS in EEP.
- To analyze the effect of project communication technique on the success of HVPTSPs in EEP.
- To explore how project communication barrier influence the success of HVPTSPs in EEP.
- To analyze the mediation role of project managers' competency in the relationship between the project communication and project success in HVPTS of EEP.
- To explore the moderation role of senior managements on relationship between the project communication and project success in HVPTS of EEP.
- To evaluate the moderated mediation effect of senior managements' support and project managers' competency on the relationship of project communication practice, techniques and barriers with the project success in HVPTS of EEP.

1.5 Hypothesis of the Study

Hypothesis of the study are: -

- H1: There will be a positive significant impact of project communication practice on the success of HVPTS projects of EEP through mediation of project managers' competency and moderation of senior managements' support.
- H2: Project communication techniques will have a positive significant impact on the success of projects in the HVPTS of EEP if the relationship is mediated by project managers' competency and moderated by senior managements' support
- H3: Senior managements' support will moderate the negative significant impact of project communication barriers on project success when mediated by project mangers' competency in HVPTS projects of EEP.

1.6 Significance of the Study

The finding of the study would give insight how the project communication is practiced in HVPTSPs of EEP. In addition, it contributes to the existing researches on the impacts of project communication on success of projects. In addition, this study contributes to the study in having different moderator and mediator namely project managers' competency and senior managements support on assessing the impact of project communication managements on the success of the project Besides, it would act as a resource for anyone who wants to do further research on the same or similar subjects.

1.7 Scope of the Study

This study is limited to high voltage transmission and substation projects of Ethiopian electric power company which are currently under implementation with the project office situated in the Head office, Addis Ababa. To mention some: -

- Bahir Dar – Woldiya- Combolcha 400 KV power transmission projects
- Azezo – Chilga, Fincha- Shambu and Metu – Masha 230 KV projects
- Awash – Weldiya Railway Power Supply 132 & 230 KV Projects
- South Eastern National Grid Expansion projects of 132 and 230KV voltage level
- Agro Industry Power supply 132 and 300 KV projects

And the scope of these projects is to study the project communication practice on these projects of EEP and to study the effect of the communication on the success of these projects. The population under the study are key project stakeholders such as contractors' team member, consultants, designer engineers, project managers, participating in the project, transmission and substation operation managers who accept the project for operational activities.

1.8 Limitation of the Study

The research project encountered several limitations commonly observed in research studies. The first limitation pertained to time and resource constraints, which restricted the study population to transmission and substation projects, while neglecting other projects such as power generation projects that should have been taken into account. Additionally, due to time limitations, only one mediator and moderator were utilized, whereas the research could have explored the effects of additional mediator and moderator variables. Furthermore, data

collection posed challenges due to the unwillingness of certain participants to complete the questionnaires.

1.9 Organization of the Study

This paper is organized in five chapters. The first chapter consists of background, problem statement, research questions, objective, significance, scope, organization and limitations of the study. The second chapter presents the literature review on theoretical, empirical and conceptual framework of the project communication, project managers' competency, senior managements support, project success and effect of the project communication on success of projects. The research's design and methodology are described in chapter three. The fourth chapter of results and analysis summarizes results of the study with the interpretation and discussion of the outcomes of the study. The fifth chapter contains the summary, conclusion and recommendations on summarizing topics of findings, conclusions, recommendations and future research recommendations. Finally, references, appendices, and other significant documents are attached as in the last section of the paper.

Chapter 2 : Literature Review

This chapter focus on the literature review of project communication management, techniques and barriers of project communication. It also gives insight on the basic explanation of project success, project managers competency and senior managements support. Moreover, it tries to explain the significance of project communication on the project success. In the empirical review the impact of project communication on the success of projects is explained. In addition, the mediation role of project managers' competency and the moderating effect of senior managements support in the relationship of project communication with the project success is explained.

2.1 Theoretical Review

2.1.1 Project Management and Project Management Knowledge area.

According to (PMBOK, 2017) a project is defined as “*a temporary endeavor undertaken to create a unique product, service, or result*”. “*Uniqueness*” refers to meeting certain objectives through deliverables while “*temporary endeavor*” signify that projects have agreed schedule of time. However, project deliverables could be used way beyond the lifecycle of the projects.

And referring to the International Project Management Association (IPMA, 2015), projects are defined as an organized effort with a predetermined output with characteristics of uniqueness, transient, consisting of organized interrelated activities, involving various disciplines and constrained by certain factors.

According to (Prabhakar, 2008), a project could be classified on the bases of complexity, size, level of risks in the project, and the level of involvement of customers. Thus, a project

could be complex, large, high risk or customer focused as the case may be. In contemporary world, projects are a means to create values and benefits to the organization and helps to enhance the competitive advantage (PMBOK, 2017).

And referring to (PMBOK, 2017), project life cycle is effectively managed by implementing a sequence of project management processes such as initiating, planning, executing, monitoring & control and closing process groups.

There are various perspectives and points of view regarding what project management entails, and commonly accepted ones are from the professional bodies. And according to association of project management (APM), project management is viewed from the perspective process that is followed to achieve anticipated output which tries to achieve the expectation of the stakeholders. (APM, 2016; PMBOK, 2017).

Project management is the use of knowledge, skills, tools, and techniques on project works to achieve the project objectives and deliverables, and it enables organizations to implement projects successfully and efficiently. It is achieved by the proper application and fusion of its management processes. And task of managing a project are determining requirements, responding to needs, concerns and expectation of the stakeholders, establishing and upholding open lines of communication, managing resources; and managing project constraints of scope, time, budget, quality, resources and risk. And therefore effective project management has an advantage of achieving business objectives, stakeholder's satisfaction, highest probability of success, good risk response, and optimal use of organizational resource etc. However, poor management of projects leads to cost overrun, missed schedule, poor quality, loss of status of the organizations etc. (PMBOK, 2017).

PMBOK identified ten knowledge areas in the project management which are interrelated and has the significant impact on the success of projects and project management practice. These knowledge areas are project integration, scope, schedule, cost, quality, resource, communications, risk, procurement, and stakeholder management.

2.1.2 Project Communication Management

According to the project management body of knowledge, “*communication is the exchange of information, intended or involuntary. The information exchanged can be in the form of ideas, instructions, or emotions*” (PMBOK, 2017).

Communication manifests in various forms, encompassing verbal and non-verbal expressions, active and passive modes, formal and informal channels, as well as conscious or subconscious actions. The execution of communication significantly influences comprehension and emotions, both of which shape the interpretation and significance of the message received (APM, 2016).

And in meeting project objectives through deliverables, project management tasks require sending and receiving information and instruction via proper channel of communications among the project participants to enhance the understanding level of the project progress and status (Abdullahi et al., 2021).

Project communication is the sharing of information relevant to a project with the goal of fostering mutual understanding between the sender and the recipient which is vital for the success of a project. And it is imperative for the project team to furnish all stakeholders with precise and timely information which will enable the project team to understand and fulfil the needs of the stakeholders and gather feedbacks. Moreover, project communication is important in every lifecycle of project which enable to take corrective action and control the project

deliverables (Office of Project Management Process Improvement, 2007). And communication is effective if the recipient comprehends the message as intended by the sender which enable to achieve he project objectives efficiently (Olanrewaju et al., 2017b).

Communication serves as the conduit for exchanging information and instructions and it is success when the intended meaning of the corresponds accurately to with the interpreted meaning of the receiver (APM, 2016).

And according project communication hand book, project communication management is one of the important project management knowledge area that utilizes the necessary procedures to guarantee the suitable and timely creation, gathering, sharing, storing, retrieving, and final disposal of project information to stakeholders. And practicing project communication is one of the major duty of every member of project team but developing plan of communication is the task of the project manager in particular through the consultation of task managers and project development team (Office of Project Management Process Improvement, 2007).

Project communications management ensure that the information requirements of the project and its stakeholders are addressed through the creation of artefacts and the execution of initiatives meant to promote efficient information flow. For effective project communication management, first communication strategy is developed and then the project communication management plan is set that helps carrying out tasks to ensure implementation the developed strategies. And hence Building relationships through communication is essential for the successful completion of projects and programs(PMBOK, 2017).

Practicing the communication management in implementation of projects require the understanding of project communication management processes groups. And referring to

(PMBOK, 2017), there are three process groups namely plan, manage and monitor communications in the course of practicing the project communication management.

2.1.3 Plan Communications Management

It is the process of creating a suitable plan and framework for project communication activities according to the needs of the project, the organizational resources, and the information demands stakeholders (PMBOK, 2017).

Project communication activities are supported by careful selection of the techniques, messengers, and messages derived from the planning process which attempts to avoid misconceptions and miscommunication in the project deliverables, schedule, quality and cost (PMBOK, 2017).

Project communication management plan is prepared as an integral part of the project management plan which needs the sponsor's authorization. This communication plan is a dynamic document that remains live throughout the project. It will undergo updates and revisions as the project advances and communication requirements evolve to ensure its continued effectiveness (APM, 2016).

The first process in producing the project management plan is collecting the project inputs from the work breakdown structures (WBS) and project charter. In addition, stakeholders along with their needs, expectations, and the appropriate communication technique which foster proper information exchange are identified. Subsequently a draft of the communication plan is prepared and it is subjected to approval by the project stakeholders and managers. Furthermore, it is understood that the project communication management plan is a dynamic document that evolves throughout the project's life cycle and can be updated as necessary (Almayahi & Ismail, 2017).

2.1.4 Manage Communications

This is the process that guarantees the timely and proper gathering, production, exchange, storing, retrieving, controlling, tracking, and final disposal of project data (PMBOK, 2017).

2.1.5 Monitor Communications

It is the process of ascertaining whether the project's and its stakeholders' information demands are satisfied (PMBOK, 2017).

The project communication management process offer the vital connections between individuals and data required for effective communication.(Office of Project Management Process Improvement, 2007).

Figure 2.1 show the overview of project communication management processes according to the project management body of knowledge. And the project communication management is continuous process that is implemented in all lifecycles of the project.

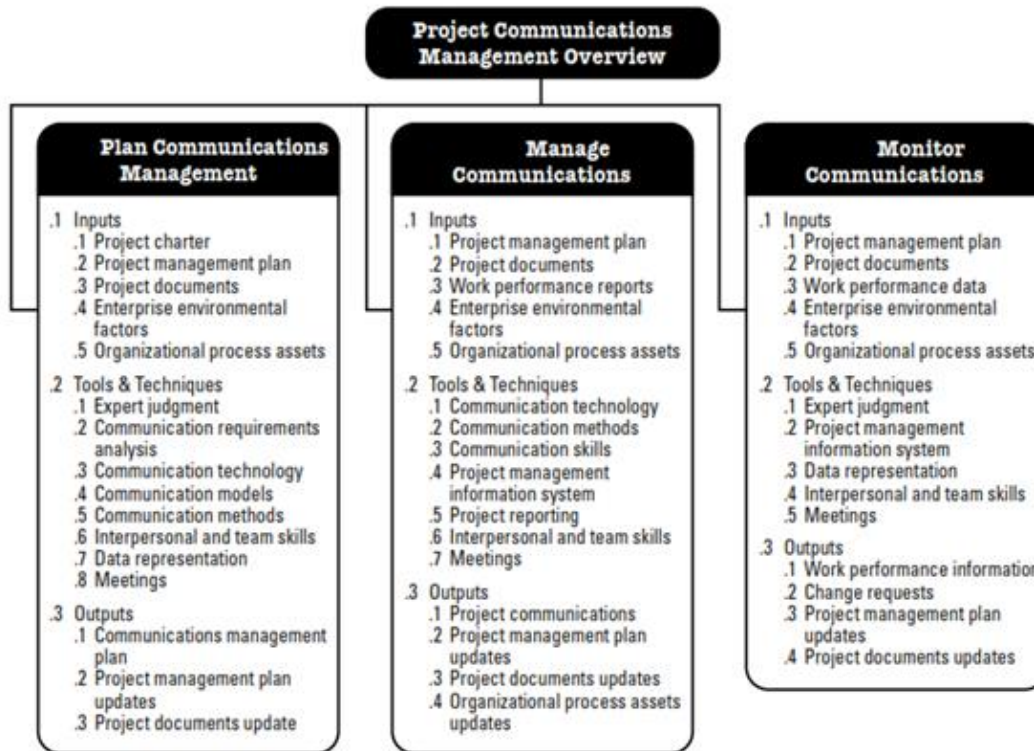


Figure 2.1 Overview of project communication management processes

In practicing communication in the projects there are different ways by which communication in the projects are taking place such as written, verbal, formal or informal, by body languages, through media (PMBOK, 2017)

In the process of project implementation, majority of the time spent by the project managers are on the communication with the project team members, internal and external project stakeholders which help stakeholders with diverse organizational and cultural backgrounds and possess varying degrees of experience, viewpoints, and interests to have common understanding on the project deliverables. And communications are either internal, which is within the project and organizations it is implemented, or external, which are information exchange to the external stakeholders such as customers, suppliers, government, the public, environmental advocates and other projects and organizations (PMBOK, 2017).

Proper grammar and spelling use, concise language and the removal of superfluous words, well stated goal and expression, coherent logical flow of information and controlling exchange of words and ideas are the key for avoiding misunderstanding in the project communication. Furthermore, communications skills such as listening, understanding of the cultural and personal heterogeneity, managing stakeholder's expectation, development, influence, motivating, mentoring, negotiation and dispute resolution helps to assist communication process in project management (PMBOK, 2017).

Maintaining healthy relationships with stakeholders requires a focus on stakeholder's engagement and developing and implementing appropriate communication strategy. And the emerging trend in project communication management practice include the followings.

- Stakeholder's involvement in the project review
- Participation of stakeholders in the project meetings
- Growing reliance on social media platforms.
- Adopting a multi-dimensional communication approach (PMBOK, 2017).

Moreover, given the distinct nature of each project, it is imperative for project team members to customize the implementation of Project Communications Management processes. This customization takes into account various factors such as stakeholders, geographical location, communication technology, language, and the availability of knowledge management resources (PMBOK, 2017).

In the realm of project management, effective communication with stakeholders plays a pivotal role, particularly in the domains of cost, scope, time, and quality. Communication serves as the crucial function that integrates these elements to deliver a high-quality product, which serves as the cornerstone of project success. By maintaining clear and cohesive

communication channels, project managers can ensure that stakeholders are appropriately informed and engaged throughout the project lifecycle, ultimately contributing to the achievement of project objectives (Zulch, 2014).

Construction projects are distinguished by their distinct organizational structures and delivery techniques, which are tailored to each owner's specific requirements. They are also recognized for their non-standardized reporting matrix. As a result, in order to execute projects effectively, construction parties must communicate effectively and get a significant grasp of the various project delivery models and their contractual requirements (Yakubu et al., 2019).

Communication within a project can flow in multiple directions, depending on the individuals involved. Upward communication transpires as field artisans/supervisors relay information to project management, while lateral or horizontal communication unfolds between the client organization and project teams, as well as amongst the project teams themselves (Yakubu et al., 2019).

Effective communication should ideally be unambiguous in theory, but its practical implementation and interpretation heavily rely on the individuals within the construction sector. Thus, it can be argued that experienced professionals in construction have acquired skills to navigate complex communication situations, enabling them to overcome the inherent challenges of short to medium-term interface. However, due to the ever-changing nature of the construction sector and the diverse backgrounds of its participants, including varying disciplines and managerial/professional roles, the successful implementation of good practices cannot be guaranteed (Sean & Li, 2018).

Project managers collaborate with team members to establish project goals and distribute responsibilities, relying on regular communication, both in-person and through computer-

mediated channels. Consequently, communication plays a paramount role in effective project management. Project managers must possess the ability to communicate in a timely and efficient manner, ensuring that all team members are well-informed about the project's progress through appropriate communication channels. Accordingly, successful project management necessitates adapting communication methods and language based on the specific context of each communication instance (Rodríguez, 2017).

A clear channel of communication preferred by majority of project team and stakeholders need to be deployed to avoid complaints and conflicts during the project lifecycle. Moreover, project managers play a vital role in guiding project team members on the proper conduct of project communication. They should ensure the availability of feedback channels for both internal and external use. By implementing these measures, project managers can foster effective communication, minimize misunderstandings, and maintain a harmonious project environment (S.senyange et al., 2017).

2.1.6 Project Communication Techniques.

Project communication management process utilizes a range of tools and techniques during the planning, managing, and monitoring stages of communications. These include experts' judgment, communication requirements analysis, communication technology, interpersonal and team skills, data presentation, and meetings. (PMBOK, 2017)

To successfully complete a project in line with specifications, on time, and within the allocated budget while meeting the client's needs, project professionals must prioritize the seamless transfer of relevant and suitable information to the right individuals throughout all stages. Therefore, it is imperative to utilize appropriate techniques for information transfer and

establish effective communication channels to effectively tackle and overcome any infrastructural challenges that may arise (Sean & Li, 2018)

According to project management body of knowledge, communication techniques encompass various modes, including:

✓ **Formal and Informal Communication:**

Formal communication involves structured channels such as reports, meetings, minutes, stakeholder briefings, and presentations. Informal communication, on the other hand, occurs through mediums like emails, social media, websites, and ad hoc discussions.

✓ **Hierarchical Focused Communication:**

This type of communication considers the position and hierarchy of stakeholders or groups within the project. It influences the format and content of information shared. Examples include upward communication with senior management and stakeholders, downward communication with project teams and working groups, and horizontal communication between peers or the project manager.

✓ **Official and Unofficial Communication:**

Official communication refers to formal methods used for reporting to regulators, government bodies, or annual reports. Unofficial communication, on the other hand, emphasizes building project recognition and strong relationships between the project team and stakeholders. These unofficial communications often employ flexible and informal means.

✓ **Written and Oral Communication:**

Communication can take the form of written or oral means. Written communication includes reports, emails, memos, and documentation. Oral communication involves face-to-face conversations, meetings, presentations, and phone calls.

And adopting appropriate communication techniques requires considering the specific context and audience of the project. By utilizing these techniques effectively, project teams can foster clear and efficient communication, leading to improved project outcomes and stakeholder engagement (PMBOK, 2017).

According to the study on assessing communication practices in construction project management, it reveals that drawings are identified as the primary mode of communication and the findings indicate that drawings are extensively utilized and considered a formal means of communication within the industry (Abdullahi et al., 2021).

For project team members, it is necessary to disseminate relevant and appropriate information to the right individuals throughout all project stages. This ensures the creation of a systems that aligns with specifications, schedule, cost to satisfy the client requirements. Therefore, it is crucial to employ suitable techniques for information transfer and establish effective communication channels for resolving infrastructural challenges (Sean & Li, 2018).

Utilizing various forms of communication such as written, oral, and electronic channels can significantly enhance the effectiveness of communication, particularly during the construction phase. By employing these communication techniques through project professionals and project managers, it becomes possible to mitigate the occurrence of communication barriers. This proactive approach aids in the smooth implementation of infrastructure projects by facilitating clear and efficient information exchange among all stakeholders involved (Sean & Li, 2018).

Effective communication techniques are essential for the successful management of construction projects. And it is crucial to establish proper and suitable methods of communication that facilitate the exchange of information between project team and site office.

The supervisory and management teams should adhere to these techniques to ensure smooth operations. Furthermore, it is important to encourage informal communication among project teams. Informal conversations foster trust and coordination among team members, ultimately contributing to the overall success of the project. By creating an environment that promotes open dialogue, project teams can effectively collaborate and achieve their goals (Malik et al., 2021)

Managing communication effectively involves documenting both positive and negative lessons learned. This practice enables continuous improvement and development in projects while also helping to prevent future mistakes. By capturing and analyzing these lessons, valuable insights can be gained and applied to enhance future project outcomes. Moreover, incorporating good practices is vital as they allow the application of successful methodologies from similar projects. By leveraging proven approaches and strategies, project teams can increase their chances of achieving favorable results. Implementing these communication techniques enhance efficiency, mitigates risks, and improves overall project success (Daresbury et al., 2001).

2.1.7 Barriers to Project Communication.

Despite the increasing number of construction projects in developing nations, project success is often impeded by miscommunication and conflicts. To overcome these challenges, project managers and company owners must actively promote healthy communication among team members and work towards eliminating communication barriers (Malik et al., 2021).

The efficacy of communications is influenced by several aspects. Cultural background combined with ephemeral elements like mood, current environment, and team dynamics,

present a dynamic challenge for communicators, constantly evolving and requiring adaptability (APM, 2016).

In the construction projects, language is identified as the most commonly cited barrier to effective communication among all stakeholders and it is more common on the site working groups (Abdullahi et al., 2021). And according to (APM, 2016), (APM, 2016) language needs to be impartial, unbiased, and free of superfluous emotional phrases but there could be instances in which the right emotion along with related delivery systems like body language might produce a particular, intended result.

Effective communication is frequently impeded by barriers, which can take the form of physical factors like team's workspace or location. Additionally, cultural barriers may arise due to a lack of mutual language or comprehension across different disciplines. These barriers can result in negative perceptions and give rise to emotions such as envy, fear, mistrust, and suspicion (APM, 2016).

Effective communication barriers give rise to communication problems in the construction sector, hindering the efficient exchange and utilization of construction-related information. These obstacles include physical barriers, issues with organizational structure, attitudinal challenges, language ambiguity, individual linguistic abilities, physiological factors, oversimplified information presentation, communication and feedback issues, and work pressure. Collectively, these factors impede the smooth flow of information within the construction industry (Yakubu et al., 2019).

Physical barriers refer to environmental challenges and obstacles that hinder effective communication in a physical setting and arise from factors such as geographical distance, inadequate or outdated equipment, management's failure to implement new technologies, staff

shortages, background noise, inadequate lighting, low morale, and difficulties in maintaining concentration. (Yakubu et al., 2019).

Defective organizational structure encompasses systemic flaws within an organization's framework that impede effective communication among team members, characterized by unclear reporting lines, inefficient information systems, inadequate supervision, insufficient training, and ambiguity in roles and responsibilities (Yakubu et al., 2019)

Attitudinal barriers for communication in the construction projects arise from problematic staff behaviors within an organization, such as poor management techniques, a lack of team member consultation, interpersonal disputes, a reluctance to communicate effectively, low motivation, general dissatisfaction, inadequate training, and resistance to change. These obstacles create serious problems for the project's performance because they impede teamwork, encourage negativity, and reduce the team's ability to communicate effectively as a whole (Yakubu et al., 2019).

Ambiguity of words or phrases occurs when a communicator make use of terms that possess similar sounds but convey distinct meanings. This language ambiguity raises the possibility of miscommunication and confusion. And hence to guarantee precise and correct understanding among team members which reduce the possibility of misinterpretation and foster successful project communication, it is imperative to address and resolve such ambiguities in while managing construction project (Yakubu et al., 2019)

Individual linguistic ability is language skills and proficiency of each team member involved in the project which pertains to members' capability to effectively communicate, comprehend, and express ideas, instructions, and information in the project's primary language

or languages. Diverse linguistic ability among team members can impact communication clarity, comprehension, and overall project collaboration (Yakubu et al., 2019).

Physiological barriers are resulted from personal discomfort of individuals which impede effective communications. These barriers include hearing or speech impairments, visual impairments, cognitive limitations, language barriers, and other physical conditions that affect an individual's ability to send or receive information accurately (Yakubu et al., 2019).

Furthermore, a significant barrier to effective communication in project management is the project team's inability to present information in a clear and desired manner to the intended target audience. This challenge hinders the successful transmission of key messages and can lead to misunderstandings or misinterpretations (Yakubu et al., 2019).

In addition, the communication and feedback mechanisms within projects have the potential to influence outcomes either positively or negatively. These mechanisms manifest through formal meetings, reporting of design errors and unsafe working practices, open discussions about management plans, and the utilization of feedback systems to implement corrective measures and re-plan accordingly. However, inefficient communication feedback system can affect the project success negatively and consider and the barrier to the project communications (Yakubu et al., 2019)

Moreover, work pressure resulting from an overwhelming workload on project team members is one of the cause of ineffective communication in project management. It not only hampers the creation of conducive working conditions but also negatively impacts the overall progress of the project by creating increased stress and fatigue which reduced capacity to effectively communicate and collaborate (Yakubu et al., 2019).

Based on a study examining the causes and effects of poor communication in the construction industry, the absence of a well-defined project communication procedure and insufficient training programs are identified as major causes. In addition, inadequate representation of project stakeholders aggravates communication challenges. Moreover, a lack of mutual understanding among the involved parties is found to be a prominent cause of poor communication in construction projects. These factors collectively lead to adverse effects, such as misinterpretation of information, conflicts, and delayed responses to potential disasters (Suleiman, 2022).

Effective communication barriers include poor listening, ineffective leadership practices, ambiguous communication objectives, imprecise channels of communication, poor reporting systems, ineffective communication amongst project experts, labeling or stereotyping, and linguistic complications. And these barriers hinder the smooth exchange of information, impede understanding, and undermine collaboration within project teams which later affect the project success and impact the project schedule and cost negatively. In addition, major communication barriers in the infrastructure projects include lack of communication skill, conflict of interest, lack of trust, availability of limited for communication resource, political or community intervention in the projects, lack of determination among the project teams, conflicting cultural values, poor determination and commitment and age difference are major communication barriers on infrastructure projects (Sean & Li, 2018)

Neglecting effective communication in construction projects often leads to potential accidents and casualty, which subsequently impact the overall outcome of the activities. Several barriers hinder effective communication, including inappropriate communication

channels, breakdowns in communication, information overload, and a lack of transparency and filtered information (Olanrewaju et al., 2017a).

2.1.8 Project Success.

Conventionally, project management performance indicators of schedule, cost, scope and quality have been used as significant factor in defining the success of a project. To ensure accurate assessment, the ongoing performance of the project must be measured and compared against the primary goals related to the triple constraints which enables effective cross-referencing and verification of the project's success. However, relying solely on these triple constraints to gauge project success can be challenging. Nowadays, project success is also evaluated based on how well the project objectives are accomplished (Kimutai, 2018; PMBOK, 2017).

Moreover, the success of projects encompasses additional criteria that are closely tied to organizational strategy and the achievement of business outcomes. These criteria for measuring project success include comprehensive benefit plans, meeting the pre-determined financial benchmarks, and fulfilling the non-financial objectives outlined in the project's business case, the successful transition of the organization from its current state to the desired future state, adherence to contract terms and conditions, alignment with organizational strategy, goals, and objectives, the satisfaction of stakeholders, successful adoption by customers or end-users, seamless integration of deliverables into the organization's operating environment, the achievement of agreed-upon quality standards, and compliance with governance criteria. And the financial measures of the project success include net present value (NPV), return on investment (ROI), internal rate of return (IRR), payback period (PBP) and benefit-cost ratio (BCR) (PMBOK, 2017).

A project can be considered successful in terms of scope, schedule, and budget, yet still fall short from a business perspective. This situation can arise when there are changes in business requirements or the market landscape before the project reaches completion. In such cases, the project may not align with the evolving needs of the business or adapt to the shifting market environment, thereby impacting its overall success despite meeting the traditional project management metrics.

2.1.9 Project managers' competency

High investment projects are a way for achieving the strategic goal for the organization and have a potential to bring about sustainable development and managing these projects require technical knowledge, competent human capital and good management ability for the successfully completion (Usman, 2018).

The critical task in managing projects is arranging, coordinating and executing different tasks of a project in the agreed time frame. And the project managers need to apply various skills to achieve the project objectives. The followings are the major tasks of the project managers (Duru & Alhasweh, 2013).

- Collaboratively working with the project team to increase the team efficiency
- Ethically responsible to work with the cross functional work groups for the common goal and objective.
- To bring about the project deliverables in each milestone within the constraints resources, time, cost and quality.
- Making decisions regarding the project activities in time to meet the project objective
- Being the communication hub for resolving pending and imminent conflicts.

-
- Monitoring & control of project progress to achieve the work packages with in the project constraints.

And to accomplish the required tasks of the project management, project managers need to have the competency for the successful management of projects. And project managers need to have a set of project practice, perspective, people (IPMA, 2015).

According to the study on the project management competence and complexity in the projects, it's found out that project manager competence has a positive impact on project success. Moreover, capabilities on technical and leadership qualities are the most vital for the effective project management (Usman, 2018).

In addition, project managers' leadership abilities have a significant impact on the success of project. And the project managers' competency helps to develop a productive environment that assist the project team to work efficiently and in the end ensures the project success (Araújo & Pedron, 2015).

Referring to (PMCD, 2007) project managers competency are the followings.

Communicating

- Actively listens, understand and responds to stakeholders
- Maintains lines of communication
- Ensures quality of information
- Tailors communication to audience

Leading

- Creates a team environment that promotes high performance
- Builds and maintains effective relationships
- Motivates and mentors project team members

-
- Takes accountability for delivering the project
 - Uses influencing skills when required

Managing

- Builds and maintains the project team
- Plans and manages for project success in organized manner
- Resolves conflict involving project team or stakeholders

Cognitive Ability

- Takes a holistic view of project
- Effectively resolves issues and solves problems
- Uses appropriate project management tools and techniques
- Seeks opportunities to improve project outcome.

Effectiveness

- Resolves project problems
- Maintains project stakeholder involvement, motivation and support
- Changes at the required pace to meet project needs
- Uses assertiveness when necessary

Professionalism

- Demonstrates commitment to the project
- Operate with integrity
- Handles personal and team adversity in a suitable manner
- Manages a diverse workforce
- Resolves individual and organizational issues with objectivity

Studies (Lei & Skitmore, 2016) have revealed that the foremost skills essential for an effective project management comprise good communication skill, followed by the ability to achieve project objectives and make decisions.

2.1.10 Senior managements support

Senior managers play a significant role in establishing and facilitation the necessary settings for the success of projects through meta-structuring and technology use mediation. Meta-structuring is the process of organizing or structuring that involve in developing system framework for efficient management and coordination of various elements within a project or organizational context. Technology-use mediation refers to the process of utilizing technology as a means to facilitate and mediate interactions, communication, and activities between individuals or groups. Moreover, senior managers are critical in defining a project and the makeup of the project team (Ahmed et al., 2016; Boonstra, 2013)

Research indicate that (Ahmed et al., 2016) the probability of project success increase if there is an assistance of senior or top managements in providing necessary resources, making suitable structural arrangement, enhancing good communication, allocating experts and use the organizational power.

And according to (Boonstra, 2013) senior managements backing up in projects are categorized as their support in resources, structural arrangements, communications, expertise and power.

➤ Providing resources

The senior management in an organization ensures the allocation of financial, material, and human resources necessary for the successful execution of projects aligned with the strategic objectives of the organization. Moreover, providing adequate resources for a project

enhances the morale of project managers and teams, as it signifies that top management prioritizes the project's alignment with strategic or business objectives. This support plays a crucial role in the success of projects.

➤ **Structural arrangements**

The project framework, developed with the consent of senior management, along with the organizational structure, facilitates adaptation to changes in the project environment. This synergy enables the organization to navigate and thrive amidst evolving circumstances, ensuring successful project outcomes.

➤ **Communications**

Frequent formal and informal communication among senior management, the project team, and the rest of the organization is crucial for the success of the project. Additionally, senior management plays a vital role in supporting the project by enthusiastically communicating and expressing openness to adapt the organization, system, and stakeholder relationships as needed. Furthermore, meetings attended by the organization's top managers are seen as having robust support for the project execution. In addition, senior managements support is addressed through effective communication via regular emails, phone calls, and face-to-face meetings.

➤ **Developing and deploying expertise**

The senior management need to have a comprehensive grasp of both the project management aspects of the strategic project and the content, context, and ramifications of the proposed system. The presence of an appropriate level of knowledge and interest in senior managements of the organization served as a significant form of support to the project.

➤ **Using power**

The behavior of the senior managements in using their formal power to resolve disputes and protecting the project team during political conflicts and protecting the project team is helpful in supporting the project success

2.1.11 Significance of project communication management on project success.

Projects play a critical role in achieving organizational objectives and gaining a competitive edge in global markets. Project managers must collaborate with team members to define project goals and distribute responsibilities. To accomplish this, project managers should engage in regular communication, whether face-to-face or through computer-mediated means, to establish project goals, team dynamics, and understand customer expectations. The effectiveness of communication is paramount in shaping and influencing the relationship between the project manager and project members, as well as their collective efforts to achieve the project goals. Neglecting transparency and openness in project management can lead to misunderstandings among team members, potentially resulting in project failure. Communication also plays a crucial role in facilitating active contribution and the sharing of ideas from all project members. It is crucial that communication in project management occurs bidirectional, enabling team members to feel accountable for their roles and responsibilities in order to successfully accomplish the project goals and objectives(Rodríguez, 2017)

The success of a project greatly depends on the effective communication, consultation, and information-sharing among the client, designer, and constructor. These factors play a crucial role in ensuring the implementation of best practices and promoting construction safety, which are instrumental in achieving project success (Sperling et al., 2008).

Well established project communications are extremely important in planning and managing the stakeholders' exceptions. Thus, various conventional methods of

communication, such as face-to-face meetings, telephone conversations, regular interface meetings, and virtual design and construction, play a vital role in achieving effective communication (Yakubu et al., 2019).

In today's landscape, project communication has become increasingly intricate, and the timely exchange of project information has become paramount for project success. The absence of an appropriate communication medium is one of the leading factors contributing to ineffective communication. Consequently, poor communication in projects results in deficiencies in documentation, hindered information sharing, and compromised storage practices. (Suleiman, 2022).

The study reveals that poor communication, inadequate communication skills, and the absence of a suitable communication framework in construction projects result in project outcomes that deviate from the intended project objectives (Zulch, 2016).

The effectiveness of project communication is based on the accurate delivery of appropriate information to the intended recipients timely and cost effectively and it plays a significant role in achieving project objectives by ensuring that team members, stakeholders, and managers are well-informed and aligned with the project's trajectory. In addition, good project communication practice plays a vital role in identifying challenges, risks, misunderstandings, and other factors that could hinder the project's success. And therefore, efficient communication system and its application is fundamental for effective operation of teams in the construction projects (Sean & Li, 2018).

Moreover, in the management of infrastructure projects, open communication is crucial for providing the management with a degree of control over project activities. Regularly reviewing and adjusting the communication plan helps minimize communication barriers and

enhances team performance through organized meetings and the establishment of effective communication procedures. These measures significantly increase the likelihood of success in infrastructure projects. Additionally, project managers must possess excellent communication skills, and the communication plan should clearly outline the roles of stakeholders to ensure the effective dissemination of project information (Sean & Li, 2018).

Poor communication has the potential to result in a range of adverse consequences, including misconstrued requirements, ambiguous goals, the estrangement of stakeholders, ineffective planning, and various other factors. These detrimental effects can ultimately lead to the failure of a project, program, or portfolio (APM, 2016).

Even though various technique and methods of communication are available in the modern project management which enhance information exchange, there are also risks of poor communication due to the choice of poor communications medium. And the selection of an unsuitable delivery medium gives rise to barriers in communication. Insufficient structure and ineffective delivery impede the conveyance of meaning, creating obstacles to understanding and communication. These barriers can contribute to the acceleration or aggravation of failure communication which in turn affect the project delivery negatively (APM, 2016) .

Effective communication is a dynamic and interactive process that involves active participation from both parties. It entails not only conveying information but also actively seeking out and attentively listening to feedback. This feedback is a crucial component of good communication, as it provides valuable insights and perspectives. By incorporating this feedback into subsequent rounds of communication, the process becomes more informed and enables greater effectiveness in conveying messages (APM, 2016) .

2.2 Empirical Review

The significance of proper and efficient project communication practice is immense for the successful completion of projects. Efficient communication helps to devise good practice in dissemination of information through the use of proper communication techniques which will help to mitigate the problems of communication barriers and helps to have common understanding on the project goals, objective and deliverables among the stakeholders. Good project communication practice is important for tackling the communication barriers and helps to address time and budget overrun and quality issue before impacting the overall progress and success of the project.

According to the investigation on the causes and effect of communication in the construction sector in the Middle East and North Africa, poor communication, at the very least, leads to delays in time and increased costs and, on occasion, culminates in the failure of a project(Suleiman, 2022).

Language, culture, perception, knowledge, and political influence are all significant variables that can impact the effectiveness of communication strategies in the construction of high voltage power transmission lines. As a result, establishing efficient communication channels among all stakeholders becomes crucial for achieving positive outcomes in supporting the progressive construction of high voltage power transmission (Kho et al., 2019).

Studies (Suleiman, 2022) have indicated that good communication practice in the projects can be improved through understanding of causes of poor communication in the projects. And the commitment of all the stakeholders to reduce or limit the causes of poor communication will reduce the significant effect of poor communication in the life cycle of the project from inception to completion. And implementing a training program intended for enhancing

communication technique, establishing well-defined communication procedures and channels, consistently striving to improve project communication techniques and methods, and devising effective mechanism to document information for prompt retrieval contribute in fostering good communication practices within projects. Moreover, by employing communication techniques effectively, including appropriate methods and channels, the accurate flow of information is ensured, thereby mitigating misunderstandings, erroneous interpretations, conflicts, and frustrations among project team members.

Literatures (Zulch, 2016) indicate that project managers are expected to possess a range of communication skills categorized into core and important skills.. Core skills encompass decision-making, problem-solving, active listening, verbal proficiency, motivation, persuasion, conducting meetings, writing proficiency, delivering presentations, fostering team-building, and managing conflicts while important communication skills that the project managers need to possess for effective project communications are negotiation, building trust, explaining concepts, asking relevant questions, providing reinforcement, reflecting on information, engaging in public communication, incorporating humor and laughter, and practicing self-disclosure. Moreover, result in the literature indicate that communication is fundamental to the development of leadership ability and effective management in order to produce successful project. The findings in (Zulch, 2016) show that core set of communications and application skills in combination with the vital management and leadership components assist construction project managers in developing their communication abilities. And the improved communication skill in turn improve the management and leadership capabilities thereby ensuring the successful execution on projects.

The study on the effect of communication in infrastructure projects (Sean & Li, 2018) indicate that poor communication often results in project abandonment, cost and time overruns and other additional operational complications. And delay in transmission of project information negatively impact project work outputs. Moreover, inadequate and distorted information adversely affects both the quality and quantity of deliverables and outcomes of the projects activities. In addition, proper and fluent use of language plays significant role in the effective communication with project parties who reside on the project site.

The findings in (S.senyange et al., 2017) revealed that there is a positive correlation between project communication and project performance, indicating it as the reliable predictor of success. This conception has led project managers to recognize the importance of prioritizing stakeholder awareness and effective information flow in order to achieve project success.

Studies (Aziz, 2022) showed that stakeholders impact the results of the project. It is imperative to engage stakeholders early on, providing comprehensive information about project objectives, deliverables, and benefits to ensure a clear understanding. And efficient project communication management stands as an indispensable component of project management, playing a substantial role in the success of projects.

The study (Olanrewaju et al., 2017a) highlights the importance of addressing project communication in the construction sector, as neglecting it can lead to poor project performance.

Research (H. L. Chen, 2021) suggest that technical and managerial competencies in projects mediate the relationship between the project communication and project performance. project communication has the greatest impact on performance, followed closely by project

managerial competency. Moreover, adopting effective project communication practices contributes to the development of strong technical and managerial skills, ultimately leading to positive project outcomes. Furthermore, study (L. Chen, 2023) indicate that project managerial capacity mediates the relationship between the project communication capacity and the construction project performance.

When it comes to project delivery, insufficient support from senior management emerges as a primary factor influencing project outcomes. Research (Ahmed et al., 2022) indicates that senior management support plays a mediating role in the relationship between schedule delay factors and project performance. This support encompasses various measures such as resource allocation, structural arrangements, effective communication, expertise assignment, and the utilization of power.

2.3 Conceptual Framework of the Study.

The purpose of this study is to examine and analyze the impact of project communication practice, technique and barriers on the success of high voltage power transmission substation (HVPTS) projects of EEP, with the consideration of moderating influence of senior managements support and mediating role of project managers' competency.

'Project communication practice', 'communication technique' and 'communication barriers' are the independent variables of the study whereas 'project success' is the dependent variable. And 'project manager's competency' is the mediator variable while 'senior

managements support' is the moderator variable Figure 2.2 shows the conceptual framework of the study.

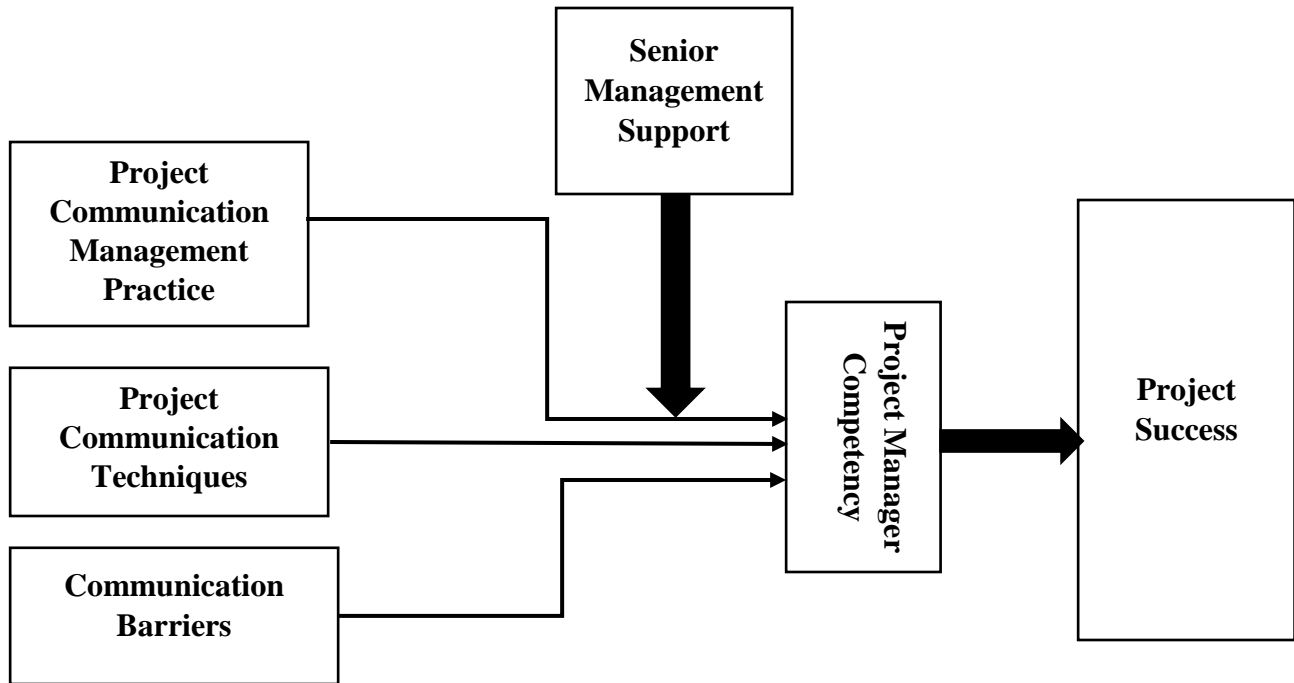


Figure 2.2 Conceptual model of the study

Sources from the literature of ((Ahmed et al., 2022) (H. L. Chen, 2021) (L. Chen, 2023) and own compilation

Chapter 3 : Research Methodology

This chapter describes the methodologies and activities that were used for the research, with an emphasis on the study's research design, questionnaire design, data collection techniques and tools, sampling strategy and data processing and analysis. It also includes a discussion on the ethical considerations made when carrying out the study.

3.1 Research Design and Approach

Explanatory research type based on the primary data collected using structured questionnaires using the Likert scale is used to analyze the impact of communication practice, techniques and barriers on the success of HVPTSPs of EEP with the mediating role of project managers' competency and moderating effect of senior managements support. The research methodology imposed in the study is quantitative and descriptive.

3.2 Target Population

The target population for this research study is project directors, project manager, site managers and project team members form the client/owner, consultant/engineer and contractor side who were actively involved in high voltage power transmission and substation projects of Ethiopian Electric power. The study population has the total size of 782 team members.

3.3 Sampling Strategy and Technique

Given the substantial population size, time limitations, and resource constraints, obtaining information from the entire population is often challenging. Moreover, as the study involves stakeholders such as clients/owners, consultants/engineers, and contractors, the technique of

stratified random sampling is employed to ensure an accurate representation of the entire population. In this study, the units of analysis are the individual team members.

The sample size was determined using the sample size formula of (Yamane, 1967) as shown below from the population size of 782.

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

Where n –sample size

N – population size

e – sampling error or level of precision (5%)

And according to the formula the sample size is 265 individual team members.

Table 3.1 Population and sample size each stakeholder group

No.	Stakeholders Group	Population Size	Proportion	Sample Size
1	Client/Owner	335	42.84%	114
2	Engineer/Consultant	322	41.18%	109
3	Main Contractors	125	15.98%	42
	Total	782	100%	265

3.4 Source of Data and Instrument of Data collection

Based on the study's purpose and empirical evidence, the data collection tool was created which is structured questionnaire developed based on the previous research studies of the same topic and adapting and modified to this research study. The table shown below indicate the sources of questionnaire for each of the variables.

The items included in the questionnaire were:

- Independent Variables
 - Project communication management practice (PrComMgmtPract)
 - Project communication techniques (PrComTech)
 - Project communication barriers (PrComBarr)
- Dependent Variables
 - Project success (PrSuccess)
- Mediator variable
 - Project manager’s competency (PrMgerComptency)
- Moderator Variable
 - Senior managements’ support (SenMgmtSupp)

All of the constructs in the variable used five point Likert scale for measurement which are 1 for strongly Disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly Agree. In addition, the questionnaire includes background of the respondents such as age, gender, level of education, work experience and role in projects.

Table 3.2:Data collection Instruments

No	Variables	Source	Items
1	Project communication management practice	(Abebaw, 2020; Kuma, 2019; Mekonnen, 2020; Wakewayaya, 2021)	22
2	Project communication Technique	(Kuma, 2019; Mekonnen, 2020)	14
3	Project communication Barriers	(Abebaw, 2020; Mezgeb, 2021)	14
4	Project Managers’ competency	(Usman, 2018)	19
5	Senior management Support	(Ahmed et al., 2022)	19
6	Project Success	(Abuya, 2015; Mekonnen, 2020; Wakewayaya, 2021)	14

3.5 Validity and Reliability of data collection instrument

Validity demonstrates if the items measure the intended outcomes and data collection instruments were pilot tested to determine the accuracy, clarity, and suitability of the variables. In addition, to make sure the instruments would be able to address all of the research questions, content validity was investigated.

Pretesting of the variables is done prior to the actual research study to ensure the reliability of the instruments under this study. The reliability analysis was done by 30 respondents, which is more than 10% of the target sample, who filled the questionnaire through web platform (google form) and hardcopy gatherings to confirm the if the response given by the participants of the pilot test would answer the research question.

Reliability analysis was conducted using Cronbach's alpha by the aid of Statistical Package for the Social Sciences (SPSS) software. Range of Cronbach's alpha is 0 to 1. When the value of Cronbach's alpha is greater than 0.7 it is considered highly reliable and the value less than 0.7 is considered less reliable. The summary result for the reliability analysis is shown in the table below and it indicate that the constructs are reliable for the measurement of the variables as the reliability result is more than 0.7.

Table 3.3: Summary Result of Reliability Analysis

No	Variables	Cronbach's Alpha	Items	Comment
1	Project communication management practice	0.848	22	Reliable
2	Project communication Technique	0.792	14	Reliable
3	Project communication Barriers	0.867	14	Reliable
4	Project Managers' competency	0.917	19	Reliable
5	Senior management Support	0.943	19	Reliable

6	Project Success	0.874	14	Reliable
7	All Variables	0.930	102	Reliable

3.6 Data Analysis

Data analysis used in this research approach was quantitative of both descriptive and inferential technique using statistical software tools of SPSS version 27 is used in this study. In addition, to test the mediating and moderating effect of variables process macro tools of version 4.2 by Andrew F. Hayes is incorporated with the SPSS software.

3.7 Ethical Issues

The researcher acquired consent from Ethiopian Electric Power to conduct research and assess the impact of project communication management on the success of high voltage transmission and substation projects. All information gathered in this research shall be exclusively used for academic purposes and respondents will be guaranteed that any information they provide will be kept anonymous.

Chapter 4 : Results and Discussion

4.1 Introduction

This chapter of the study presents and interprets the general information of the respondents, analyzes the data collected from primary data through questionnaires using descriptive statistics such as mean, standard deviation, minimum and maximum values, correlation, regression, mediated moderation analysis. Moreover; the results of the analysis shall decide whether the hypothesis presented in the study are to be accepted or rejected.

4.2 Participants' Profile

Data were collected for six variables namely project communication practices, project communication techniques, project communication barriers, senior managements' support, project managers' competencies and project success from employees who participate with owner or client, consultant or engineer and contractor on different roles in the HVPTSPs of EEP. And 265 questionnaires were distributed from which 230 (86.8%) were collected and used for the data analysis and testing of the hypothesis.

According to table 4.1 of participants' profile, 39.1% of the respondents were between age of 20 and 30 years. 28.3% of the respondents were 31 to 40 years, while 23.5% were between the age of 41 and 50 and 9.1% were above the age of 50. And the age demography of this research indicated that majority of the respondents were between the age of 20 and 30.

However, a substantial majority of respondents, comprising 78.7% (181 individuals), identified were male, while the remaining 21.3% (49 individuals) were female which underscores the existence of a gender diversity concerns within the HVPTSPs of EEP.

While examining the educational background of the respondents, majority 67.4 % of the respondents were having the qualification of bachelor's degree while the next significant qualification of the respondents was master's degree with the proportion of 14.8%. And 12.2 % had diploma while the least proportion of the respondents which was 5.7% had the qualification below diploma. This indicated that significant majority of the participants were having bachelor's degree level of education which was fit enough to respond the questionnaires of the study.

To gain insights into the experience of respondents in HVPTS projects of EEP, ranges of time span were utilized to ensure that each participant had the opportunity to share their involvement and knowledge regarding the execution of high HVPTS projects within the organization. This approach aimed to capture a comprehensive understanding of how the projects were carried out. And according to experience distribution, majority (30.0 %) of the participants were having the experience ranging 1-5 years. And 25.2 % had 6-11, 20.0% had 1-5, 15.7 % had 16-20 and 9.1% had above 20 years of experience in the high voltage power transmission substation projects of EEP. This indicated that the significant majority (80%) of the participants of the study had experience of 6 years and above in organization's particular projects and were having the good knowledge of the processes to respond the area of this study.

Furthermore, in order to comprehend the roles of the participants in HVPTS projects, it was found that the majority (95.7%) were project team members. Additionally, 1.7% of the participants held the position of program directors, while the remaining 1.3% consisted of site and project managers. These findings indicate that the participants in the study have actively engaged in the HVPTSPs of EEP, assuming various responsibilities within the projects.

Moreover, when examining the stakeholder groups of the participants in the project, it was found that 47.8% were associated with the consultant/engineer role, while 33.0% represented the owner/client side. Additionally, 19.1% of the participants were identified as members of the contractors' team. This indicated that there is a fair representation of different stakeholder groups which is crucial for understanding of level project communication and project success from each stakeholder groups.

Table 4.1 Profile of Participants

Age Distribution (in years)	Frequency	Percent
20 -30	90	39.1 %
31- 40	65	28.3 %
41 -50	54	23.5 %
51 and above	21	9.1 %
Gender Distribution	Frequency	Percent
Male	181	78.7%
Female	49	21.3%
Level of Education		
Below diploma	13	5.7 %
Diploma	28	12.2 %
Bachelor's Degree	155	67.4 %
Master's Degree	34	14.8 %
Experience (in years)		
1 – 5	46	20.0 %
6 – 10	69	30.0 %
11 – 15	58	25.2 %

16 -20	36	15.7 %
21 and above	21	9.1 %
Role in the projects		
Project Team Member	220	95.7 %
Site Manager	3	1.3 %
Project Manager	3	1.3 %
Program Director	4	1.7 %
Participants acting side		
Owner/Client	76	33.0 %
Consultant/Engineer	110	47.8 %
Contractor	44	19.1 %

4.3 Results of Descriptive Statistics

Table 4.2 Summary of descriptive statistics of variables

	N	Min.	Max.	Mean	Std. Dev.
Project Communication Practices	230	1.68	3.73	2.65	.48274
Project Communication Techniques	230	1.57	4.21	2.70	.48124
Project Communication Barriers	230	2.07	4.86	3.95	.75233
Project Managers' Competency	230	2.00	4.63	2.72	.47533
Senior Managements' Support	230	1.00	3.37	2.34	.54569
Project Success	230	1.71	4.57	2.61	.53725

The summary of table 4.2 represents the sample of 230 respondents for the independent (project communication practices, project communication techniques and project communication barriers) mediator (project managers' competency), moderator (senior

managements' support) and dependent (project success) variables. Each of the variables were composed of different constructs tested on five point Likert scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Project communication barriers have the highest mean of 3.95 (stand. dev 0.75233) followed by project managers' competency (mean=2.72 and stand. dev =0.47533), project communication technique (mean=2.70 and stand. dev =0.48124), project communication practice (mean=2.65 and stand. dev =0.48274), project success (mean=2.61 and stand. dev =0. 53725) and senior managements'' support (mean=2.61 and stand. dev =0. 53725) in descending order of ranking.

The overall assessment of the project communication practice, project communication technique, project managers' competency, senior managements support and project success in HVPTS projects of EEP is below the average which indicated that there are shortcomings in these areas which require improvement. Moreover, the understanding and availability of project communication barriers in this study is significant implying that it is important to identify challenges that hinder effective project communication. In addition, devising strategies and solutions to overcome these barriers is vital to enhance project communication.

4.4 Correlation Analysis

Correlation analysis is used to know the relationship between two variables. And the purpose of performing correlation analysis is to find out the nature of relation between the dependent variable (project success) with independent variables project communication practice, project communication technique project communication barriers, mediating variable project managers' competency and moderator variable senior managements' support in HVPTS projects of EEP.

Table 4.3 Pearson's Correlation matrix.

S.No	Variables	1	2	3	4	5	6
1	Project Communication Practices	1					
2.	Project Communication Techniques	.374**	1				
3	Project communication Barriers	-.866**	-.312**	1			
4	Project Managers' Competency	.709**	.609**	-.686**	1		
5	Senior Managements' Support	.292**	.841**	-.214**	.500**	1	
6	Project Success	.772**	.682**	-.750**	.828**	.593**	1

** . Correlation is significant at the 0.01 level (2-tailed). N= 230

Table 4.3 of Pearson's' correlation matrix indicates that project communication practices has a significant positive relationship with the project success with correlation value of 0.772 at the level of significance less than 0.001. Moreover, the project communication technique ($r=0.682$, $p<0.001$), project managers' competency ($r=0.828$, $p<0.001$) and senior managements' support ($r=0.593$, $p<0.001$) have positive significant correlation with the project success. However, project communication barrier ($r=-0.75$, $p<0.001$) has a significantly negative relationship with the project success.

4.5 Result of Regression Analysis

In this study multilinear regression analysis was employed to quantify the association between the predictor variables namely project communication practice, project

communication technique and project communication barriers with the dependent variable project success. Moreover, this method of analysis tried to indicate the relative strength to of the association between the independent variables and dependent variable.

The regression model summary of Table 4.4 indicated the value of R square which is the coefficient of determination to be 0.806. This showed that 80.6% of the change in success of high voltage power transmission and substation projects of EEP was explained by project communication practices, project communication technique and project communication barriers.

Table 4.4 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.898 ^a	.806	.803	.23819

a. Predictors: (Constant), Project communication Barrier, Project Communication Technique, Project Communication

In determining the fitness or significance of the study variables for the regression model, the ANOVA test shown in the table 4.5 was used through the assessment of the F-statistic and its associated p value. And the table shows that F-statistic has value of 312.999 with p=0.000. Since p value is less than 0.01, the model is statistically significant and implied the dependent variables (project communication practices, techniques and barriers) can be used reliably to predict the success of HVPTS projects in EEP.

Table 4.5 Analysis of Variance, ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.275	3	17.758	312.999	.000 ^b
	Residual	12.822	226	.057		
	Total	66.098	229			

a. Dependent Variable: Project Success

b. Predictors: (Constant), Project communication Barrier, Project Communication

In testing degree of multicollinearity between the predictor variables, variance inflation factor (VIF) was used. As a general rule, VIF value greater than 10 needs further investigation on significance of collinearity. As indicated in the table 4.6, all of the independent variables have VIF value less than 10 which indicate that the predictor variables are not highly correlated with each other and mulitcollinearity is not the problem that needs attention in this study. And the test showed that the data didn't suffer from issue of multicollinearity which enhanced the predictability effect of the independent variables on the dependent variable.

Table 4.6 Regression Coefficients and Collinearity Statistics

		Coefficients ^a						
Model		Unstandardized		Standardize	t	Sig.	Collinearity	
		Coefficients	Std. Error	d			Statistics	Tolerance
		β		Beta				
1	(Constant)	1.309	.331		3.955	<0.001		
	Project Communication Practices	.334	.067	.300	5.001	<.001	.238	4.199
	Project Communication Techniques	.516	.035	.462	14.616	<0.001	.860	1.163
	Project Communication Barriers	-.247	.042	-.346	-5.896	<0.001	.250	4.003

a. Dependent Variable: Project Success

The result of regression coefficient in the table 4.6 indicated that project communication practice ($\beta = 0.334$) and project communication technique ($\beta = 0.516$) had a positive effect on the success of HVPTS projects of EEP. However, project communication barrier ($\beta = -0.247$) had a significant negative effect on the project success.

The regression coefficient of project communication practices indicated that for its unit increment, project success increased by 0.334 unit and a unit increase of the project communication technique accounts to 0.516-unit increment of success of HVPTS projects of EEP. In contrary, a unit increase of the communication barriers led to 0.247-unit decrement of the project success. And based on the result of the regression coefficient the following model was fitted;

$$\text{PrSuc} = 1.309 + 0.334\text{PrComPr} + 0.516\text{PrComTec} - 0.247\text{PrComBar}.$$

Where PrSuc - project success

PrComPr – project communication practices

PrComTec – project communication techniques

PrComBar – Project communication barriers

Hence; since the t-statistics of the regression coefficients had a significant value(p) less than 0.01, project communication practices ($t= 5.001$, $p<0.001$), techniques ($t= 14.616$, $p<0.001$) and communication barriers ($t= 5.858$, $p<0.001$) had a statistically significant influence on the success of HVPTS projects of EEP.

Therefore, findings of this study depicted that the predictor variables namely project communication practices and techniques had positive and statically significant impact on the project success with later variable with a relatively higher effect. But project communication barriers had statistically negative significant impact on the success of HVPTS projects of EEP. performance.

4.6 Moderated Mediation Analysis

In testing moderated mediation effect of moderating variable (senior management support) and mediator variable (project managers' competency) in the relationship of independent variables project communication practices, techniques and barriers with project success process macro model 7 written by Andrew F. Hayes is used for the analysis.

4.6.1 Moderated Mediation on the relation of project communication practices and project success.

Table 4.7 summarized the moderator variable (senior managements' support) and mediator variable (project managers' competency) impacts in the relationship of the predictor variable (project communication practices) on project success.

According to table 4.7 the project communication practices in HVPTS projects of EEP have direct effect with β value of 0.4138 and t-statistics value of 7.9725 when tested with mediator variable project managers' competency on the projects' success. And since the confidence interval at 95% (LLCI = 0.3115 and ULCI = 0.5160) don't have the zero value in between, the effect of the project communication practice with the mediator variable on project success is significant.

Senior managements' support on HVPTS projects of EEP was analyzed on the three level as indicated in the table 4.7 also to assess conditional indirect influence of project communication practices on project success through project managers' competency. As indicated in the table, the conditional indirect effect of project communication practices on project success through project managers' competency become stronger from lower to higher level of senior managements' support with the confidence interval for lower, mean and higher levels being above the zero. Hence, this showed that senior managements' support moderates the indirect effect of project communication practice on the successes of projects via project managers' competency and the mediated relationship become stronger when the senior managers' support is higher and the indirect effect is 0.1712, 0.3408 and 0.5104 at the lower mean and higher level respectively and their effects are significant.

Moreover, as we can see the moderated mediation index for testing the moderating effect of senior managements' support on the indirect effect of project communication practice on the success of HVPTS project of EEP through mediation role of project managers' support is 0.3108 with LLCI of 0.1620 and ULCI of 0.4431 at 95% confidence interval. Hence; since the indexed moderated mediation value don't have zero in between the LLCI and ULCI, the indexed moderated mediation effect is significant. Thus, it can be concluded that positive significant effect of project communication practice on project success through the mediation role of project managers' competency is moderated by the senior managements' support in HVPTS projects of EEP.

Table 4.7 Moderated mediation effect on the relationship of project communication practices and project success

Direct effect of Project Communication Practices on Project Success					
Effect	Se	t	p	Boot LLCI	Boot ULCI
0.4138	0.0519	7.9725	0.0000	0.3115	0.5160
Conditional Indirect effect					
Project Communication Practices → Project Managers' Competency → Project Success					
Senior Managements' Support	Effect	Se	Boot LLCI	Boot ULCI	
Low level	0.1712	0.0457	0.0824	0.2628	
Mean	0.3408	0.0460	0.2513	0.4322	
High Level	0.5104	0.0719	0.3622	0.6434	
Indexed Moderated Mediation					
	Effect	Se	Boot LLCI	Boot ULCI	
Senior Managements' Support	0.3108	0.0712	0.1620	0.4431	

Note: Sample size =230, Number of bootstrap simple size=5000, level of confidence interval =95%, Se is standard error, LLCI is lower level confidence interval and ULCI is upper level confidence interval.

Conditions for moderator (senior managements' support) are the mean and plus/minus one standard deviation from the mean.

4.6.2 Moderated Mediation on the relation of project communication technique and project success.

The relationship between the independent variable 'project communication techniques' and dependent variable 'project success' in HVPTS projects of EEP under the influence of the mediation variable 'project managers' competency' and moderation effect of senior managements' support is indicated in table 4.8.

And table 4.8 showed that project communication techniques have direct effect of $\beta=0.3149$ with t-statistics equals to 6.5579 when analyzed with mediator variable "project managers' competency" on the success of HVPTS projects of EEP. And the LLCI is 0.2203 and ULCI is 0.4095 at 95% confidence interval. Hence; since the upper and lower confidence interval don't include zero value in between, the impact of the project communication techniques with the availability of mediator variable "project managers' competency" on project success is significant.

The moderator variable's conditional indirect effect on the relationship between project communication techniques and project success with mediation of project managers' competency is shown in the table 4.8. And it indicated that conditional indirect effect of project communication techniques on project success through project managers' competency increase from lower to higher level of senior managements' support with the confidence interval

excluding zero at lower, mean and higher levels. This pointed out that senior managements' support moderates the indirect effect of project communication practice on the successes of projects through mediation of project managers' competency and the indirect conditional effect gets stronger when senior managers shift their support from a lower to a higher level. And the indirect effect in the presence of the moderator at mean level is 0.3998 and it is 0.2023 and 0.5973 at lower and higher level of senior management's support. And hence the effect is more when the senior management's support is increased.

In addition, the index of moderated mediation is analyzed to check the impact of the moderator variable on the indirect effect of project communication techniques on the project success through the mediator variable. And table 4.8 showed that the effect of moderated mediation is 0.3619 with value of 0.2493 for LLCI and 0.4654 for ULCI at 95% confidence interval. And since the lower and upper confidence interval of the indexed moderated mediation doesn't include zero in between, it is therefore significant. Henceforth, it can be said that there exists a positive significant impact of project communication techniques on project success via the mediation role of the project managers' competency when moderated by senior managements' support in HVPTS projects of EEP.

Table 4.8 Moderated mediation effect on the relationship of project communication techniques and project success

Direct effect of Project Communication Techniques on Project Success					
Effect	Se	T	P	Boot LLCI	Boot ULCI
0.3149	0.0480	6.5579	0.0000	0.2203	0.4095
Conditional Indirect effect					
Project Communication Techniques → Project Managers' Competency → Project Success					
Senior Managements' Support	Effect	Se	Boot LLCI	Boot ULCI	
Low level	0.2023	0.0690	0.0698	0.3379	
Mean	0.3998	0.0677	0.2612	0.5280	
High Level	0.5973	0.0786	0.4259	0.7350	
Indexed Moderated Mediation					
	Effect	Se	Boot LLCI	Boot ULCI	
Senior Managements' Support	0.3619	0.0545	0.2493	0.4654	

Note: Sample size =230, Number of bootstrap simple size=5000, level of confidence interval =95%, Se is standard error, LLCI is lower level confidence interval and ULCI is upper level confidence interval.

Conditions for moderator (senior managements' support) are the mean and plus/minus one standard deviation from the mean.

4.6.3 Moderated Mediation on the relation of project communication barriers and project success.

The impact of project communication barriers on the successes of projects through the mediation of project managers' competencies and moderating effect of senior managements' supports is summarized in the table 4.9 shown below.

The direct impact of project communication barriers on projects' success with mediation of project managers' competency have a β and t value of -0.2452 and -7.5082 respectively with LLCI of -0.3096 and ULCI of -0.1809 at 95% confidence interval. And since the range of confidence intervals doesn't included zero, the direct effect of project communication barriers on the successes of HVPTS projects of EEP through mediation project managers' competency is significant. Therefore, the direct impact of project communication technique on the project success of projects in HVPTS of EEP is negative.

In addition, table 4.9 shows that conditional indirect effect of project communication barriers on project success through the mediation of project managers' competency decreases from lower to higher level of senior managements' support. And since the LLCI and ULLCI for lower, mean and higher levels of senior managements' supports do not include zero at 95% confidence interval, conditional indirect impact of the moderator is significant. Hence, senior managements' support moderates the indirect effect of project communication barriers on the successes of projects via mediation of project managers' competency. And the indirect effect at mean, lower and higher level of senior management's support is -0.2222, -0.1488 and -0.2956 respectively. And hence the impact become more negative when the senior management's support is increased.

Moreover, table 4.9 shows that moderated mediation effect is -0.1345 (LLCI = -0.2222 and ULCI = -0.0322) at 95% confidence interval. And since the lower and upper confidence interval of the indexed moderated mediation exclude zero, it is therefore significant. And hence there exists a negative significant relationship between project communication barriers and the success of HVPTS projects in EEP through mediation of project mangers' competency when moderated by senior managements' support.

Table 4.9 Moderated mediation effect on the relationship of project communication barriers and project success

Direct effect of Project Communication Barriers on Projects Success					
Effect	Se	t	p	Boot LLCI	Boot ULCI
-0.2452	0.0327	-7.5082	0.0000	-0.3096	-0.1809
Conditional Indirect effect					
Project Communication Barriers → Project Managers' Competency → Project Success					
Senior Managements' Support	Effect	Se	Boot LLCI	Boot ULCI	
Low level	-0.1488	0.0313	-0.2103	-0.0873	
Mean	-0.2222	0.0250	-0.2707	-0.1718	
High Level	-0.2956	0.0405	-0.3681	-0.2092	
Indexed Moderated Mediation					
	Effect	Se	Boot LLCI	Boot ULCI	
Senior Managements' Support	-0.1345	0.0480	-0.2222	-0.0322	

Note: Sample size =230, Number of bootstrap simple size=5000, level of confidence interval =95%, Se is standard error, LLCI is lower level confidence interval and ULCI is upper level confidence interval.

Conditions for moderator (senior managements' support) are the mean and plus/minus one standard deviation from the mean.

4.7 Summary of accepted or rejected hypotheses

Table 4.10 shown below tabulates accepted and rejected hypothesis of the research

Table 4.10 Summary of accepted/rejected hypothesis

Hypotheses	Statement	Results
H ₁	There is a positive significant impact of project communication practice on the success of HVPTS projects of EEP through mediation of project managers' competency and moderation of senior managements' support.	Accepted
H ₂	There exist a positive significant impact of project communication techniques on success of projects when the relation is mediated by project mangers' competency and moderated by senior managements' support in HVPTS of EEP.	Accepted
H ₃	Senior management's' support moderates the negative significant impact of project communication barriers on project success via mediation of project mangers' competency in HVPTS projects of EEP.	Accepted

4.8 Discussion of Results

In this section discussion of the study findings in the comparison with the results of previous studies conducted by the researchers is presented.

The findings of this study demonstrate a positive association between project communication practices and the success of projects in HVPTS, which is consistent with prior research conducted by Katerega and Masaba (2017). Additionally, the effective implementation of project communication, along with the utilization of sound communication techniques and methods among project stakeholders, has a significant and positive influence

on the success of HVPTS projects in EEP. This observation aligns with the findings of studies conducted by Zulch (2014) and Sean and Li (2018).

Furthermore, the results of this research indicate that the impact of project communication on project success is mediated by project manager's competencies in HVPTSPs of EEP. This finding is in accordance with the research conducted by H. L. Chen (2021), which suggests that technical and managerial competencies in projects play a mediating role in the relationship between project communication and project performance. Moreover, the research conducted by L. Chen (2023) also supports the outcomes of this study by indicating that managerial capacity mediates the influence of project communication capacity on project success.

Chapter 5 : Summary, Conclusion and Recommendation

In this chapter focus on summary of the findings, conclusion and recommendation of the study. It summarizes the research findings according to objective of the study. Furthermore, conclusion is and recommendation is suggested. The objective of the research is to assess the impact of project communication management on the success of HVPTSPs of EEP with the mediating role of project manager's competency and moderating role of senior managements support.

5.1 Summary of findings.

The main focus of the study was to analyze the impact of project communication management on success of projects in Ethiopian Electric Power projects of high voltage power transmission and substations. In the study, mediating role of project manager's competency and moderating influence of senior managements support on the relationship between project communication practice, project communication technique and project communication barriers with project success is analyzed and discussed.

The followings are the main findings of the study.

- In assessing the project communication management, the overall mean of project communication barriers is highest followed by project communication technique and project communication practice in HVPTSPs of EEP. And technique used and practice of project communication are below the neutral value. However, the availability of the project communication barriers is agreeable.

Moreover, the availability of project managers' competency and senior managements support for proper execution of the projects is below the average. And the successfulness measure of projects is below the average in HVPTSPs of EEP.

- In studying the correlation of project success with the project communication practice, communication technique, communication barriers, project managers' competency and senior managements support in HVPTSPs of EEP; the relationship between project managers' competency and project success is positive and highest followed by correlation between project communication practice and success after that the relationship of project communication technique with success and then relation of project success and senior managements support. But the relation between project success and project communication barriers is negative.

The study indicated that when there is a stronger practice of project communication management and technique the success of projects increase. However, whenever there are much barriers in communication the success rate of the project is likely to decrease in the case of HVPTSPs of EEP.

- In analyzing the total effect of the project communication practice, technique and barriers; project communication practice and project communication technique has the positive effect but project communication barriers have a negative effect on the success of HVPTS projects in EEP.
- On the study of the mediation and moderating effect of project managers' competency and senior managements support on the relationship of the project communication practice, techniques and barriers with the project success in HVPTSPs of EEP; the mediation role

of project managers' competency and moderating effect of the senior managements support is significant.

5.2 Conclusion

This study focuses on the impact of project communication practice, techniques and barriers on the success of project with the mediating role of project managers' competency and moderation of senior managements support in HVPTSPs of EEP.

The total of 265 questionnaires were distributed from which 230 responses were gathered and analyzed. The result of the analysis show that the model is significant.

All the three hypotheses of the study were accepted with the results of analysis strongly supporting these hypotheses. Moreover, the result also shows the strong significance on the relationship of the five variables namely project communication practice, project communication techniques, project communication barriers, project managers' competency and senior managements support with the project success.

The study contributes to the existing researches on the impacts of project communication on success of projects. Moreover; this study contributes to the study in having different moderator and mediator namely project managers' competency and senior managements support on assessing the impact of project communication managements on the success of the project.

The outcome of this research will help the senior organization leaders, project managers and project team members and the project stakeholders to understand the basic reasons that play a significant role in the success HVPTS projects of EEP.

5.3 Recommendation

Referring the results of the analysis and the findings of this study the following recommendations are drawn.

- The project communication management is practiced below the average in HVPTSPs of EEP and enhancing the strategic implementation of project communication planning, managing and monitoring in the course of project life cycle through the mentoring and developing seminars for the project team increase project communication practice that will have a positive effect on the timely dissemination of project information to the target group that would help to increase the success rate of the projects.
- Use of good communication techniques and methods through expert's judgment, implementation of knowledge sharing tools, deployment of vertical and horizontal communication ways, use of both verbal and written communication by regular or electronic method and planned and timely meetings can enhance the project communication techniques in HVPTSPs of EEP that contribute to the timely execution of tasks and taking decision in the project outstanding issues and help to take the right corrective action.
- Minimizing the barriers of communication by developing trust among the project team members, educating to enhancing communication skills, make use of structured reporting system, minimizing conflict of interest among the project stakeholders and implementing good project communication plan in HVPTSPs of EEP helps to facilitate project information flow and have good understanding of the project communication in the project stakeholders that will help for the effective execution of the projects.

The effective management of project is profoundly significant to meet the project constraints of time, cost and quality. Hence; to increase the efficiency of managing projects, it is necessary to enhance the competency level of projects managers through education, mentoring and exchange of experience. And helping the project managers to effectively use the leadership ability, increasing communication skill and committeemen to the project objective enhance the competency of project managers that is crucial for the effective execution of projects. Therefore, implementing a strategic approach is imperative to enhance the competency level of project managers in EEP who are responsible for managing HVPTS projects, thereby significantly boosting project success.

- For the successfulness of the project it is necessary to assign the resources, making the structural arrangement in the organization that facilitate the effective implementation of the projects, allocate experts that help the proper execution of projects and use of power for assigning priority and decision making to align the project objectives to the organization goals. These tasks need the support of senior managements in the organizational hierarchy. Hence, it is recommended to increase the involvement and support of senior managements in EEP for the successful execution of HVPTSPs.
- Moreover; since project managers' competency and senior managements support in HVPTS project of EEP help to mediate and moderate, respectively, the impact of project communication on the project success positively, emphasis should be there to increase the support of the senior managers and enhance the project managers' competency.

5.4 Further Research Recommendations

In this research the impact of project communication practice, techniques and barriers on project success along with the mediation of project managers' competency and moderation of senior managements support in HVPTS projects of EEP was studied.

And further research should be conducted the study population in different organization and other types of projects such as IT, and other construction projects. Moreover, in this research only one mediator variable and moderator variable is used to assess the impacts of project communication practice, technique and barriers on the success of projects and for the future research more than one mediator and moderator can be employed. In addition, alternative mediators and moderators, other than project managers' competency and senior management support, can be engaged.

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Annexes

Annexes A: Questionnaires

Addis Ababa University
School of Commerce
Masters of Arts in Project Management Program

Questionnaire for the impact of project communication on project success with mediation role of project managers' competency and moderation of senior managements support: The case of high voltage power transmission and substation projects in EEP.

Dear Participants:

My name is Wondwossen Abate, currently perusing MA in Project Management at Addis Ababa University School of Commerce. And I am conducting research project on “**Impact of project communication on project success with mediation role of project managers' competency and moderation of senior managements support: The case of high voltage power transmission and substation projects in EEP**” as part of my masters of art project work.

And I kindly request a few minutes of your time to fill in the below questionnaires. Your responses will be kept confidential and will only be used for academic purposes. Your name will not be mentioned, so kindly give unbiased opinion to make research successful.

Regards,

Wondwossen Abate.

(+251911282966)

I. BACKGROUND OF RESPONDENTS

- 1) What is your age in years? 1) 20-30 yrs 2) 31-40yrs 3) 41-50yrs 4) 51 yrs and above
- 2) Gender 1) Male 2) Female
- 3) Level of Education 1) Below Diploma 2) Diploma 3) Bachelor's Degree 4) Master's Degree 5) Doctorate Degree
- 4) Your project work experience in years 1) 1-5 yrs 2) 6-10 yrs 3) 11-15 yrs 4) 16-20 yrs 5) above 21 years
- 5) What is your role in the project? 1) Project Team member 2) Site Manager 3) Project Manager 4) Program Director 5) other
- 6) The stakeholder group you are working with? 1) owner/client 2) Consultant/Engineer 3) Contractor 4) other Stakeholders

II. PROJECT COMMUNICATION MANAGEMENT PRACTICE

Please consider the project communication management practice in High Voltage Power Transmission Substation Projects (HVPTSPs) of Ethiopian Eclectic Power (EEP) company in which you participated and choose the number that best describes your judgment on the following scale.

1=strongly disagree 2=disagree 3 = neutral 4=agree 5=strongly agree

S.N.	Dimension	Explanation	1	2	3	4	5
1	Communication Strategy	Communication management strategies is developed in all stages of project activities of HVPTSP of EEP					
2	Communication Planning	Project communication management plan is available in high voltage power transmission and substation projects (HVPTSP) of EEP					

3		There exist appropriate project communication approaches and plans to communicate with its stakeholders in HVPTSP of EEP					
4		Communication plan is reviewed regularly, and adjusted if need in HVPTSP of EEP					
5		List of stakeholders and groups who receive project information was properly documented in HVPTSP of EEP					
6		In HVPTSP of EEP, there is fully participation of project team members in developing of integrated communication management plan.					
7	Managing Communica tion	On-going communication between project sponsors and its stakeholders are practiced in HVPTSP of EEP					
8		High value is given for project communication management in HVPTSP of EEP					
9		Project manager and stakeholders (Contractors, consultants and other project members) Engineers, communicate throughout the lifecycle of HVPTSP in EEP					
10		Project communication barriers are properly handle in HVPTSP of EEP					
11		Communication in the workplace clarifies goals and helps coworkers collaborate in HVPTSP of EEP					
12		Project Information is disseminated timely in HVPTSP of EEP					
13		Line of communication are kept open at all times in HVPTSP of EEP					
14		Timing and frequency of delivering information to stakeholders is adequate in HVPTSP of EEP					
15		Reasonably detailed level of information was delivered to stakeholder in HVPTSP of EEP					
16		Required resources was assigned for communication execution in HVPTSP of EEP					
17		The purpose of communicating information is defined and clear					

18		Project team leaders, coordinators and project managers are committed for effective internal and external communication					
19		There is clear communication procedure in HVPTSP of EEP					
20		PMs communicate the project outstanding issues to the top managements in time and unambiguously with the participation of project stakeholders.					
21	Monitoring and Control	The Information communicated is being checked for achieving its goal to motivating, directing, informing, organizing the participation of the project team members.					
22		There is monitoring and controlling project communications in HVPTSP of EEP to ensure stakeholder communication needs are met.					

III. PROJECT COMMUNICATION TECHNIQUES

Please consider the project communication techniques in HVPTSPs of EEP company in which you participated and choose the number that best describes your judgment on the following scale.

1=strongly disagree 2=disagree 3 = neutral 4=agree 5=strongly agree

S.N.	Explanation	1	2	3	4	5
1	The right communication media in every level project hierarchical communication is used					
2	There is regular and quick dissemination of information or reporting in HVPTSP of EEP.					
3	Experts judgement is used as technique to plan and manage communication.					
4	The company deploys multiple communication modes like knowledge sharing tools, project software's and project management tools.					
5	Effective and efficient project communication methodology is deployed on projects to make sure that all information created and relayed understood by its stakeholders.					
6	There is adoption of a common working language among project team members.					

7	The right communication technology is used to disseminate and receive information among the stakeholders.					
8	All the participants of the project do give feedback to ensure communication process is complete					
9	Both vertical and horizontal channels of communication are employed while passing information and it is effective					
10	Written communication method is used in HVPTSPs of EEP					
11	Electronic communication method is used HVPTSPs of EEP					
12	Verbal communication method is used as a tools in HVPTSPs of EEP					
13	Regular project meetings are used as in HVPTSPs of EEP					
14	Project status report is used as the communication mechanism in HVPTSPs of EEP					

IV. PROJECT COMMUNICATION BARRIERS

Please consider the project communication barriers in HVPTSPs of EEP in which you participated and choose the number that best describes your judgment on the following scale. 1=strongly disagree 2=disagree 3 = neutral 4=agree 5=strongly agree

S.N.	Explanations	1	2	3	4	5
1	Lack of trust among the project team is the is hinder effective communication					
2	Language proficiency					
3	Lack of clarity of messages					
4	Poor communication skills of project team members					
5	Late or lack of responsive feedbacks					
6	Long project organizational hierarchical line of communication					
7	Ineffective and unstructured reporting system					
8	Poor listening ability of project team members					

9	Ambiguous project communication objective					
10	Conflict of interest among the project stakeholders					
11	Lack of project communication procedure					
12	Limited resources for communication					
13	Geographical distance					
14	Lack of communication plan					

V. PROJECT MANAGER'S COMPETENCY

Please consider the project manager's competency in HVPTSPs of EEP in which you participated and choose the number that best describes your judgment on the following scale. 1=strongly disagree 2=disagree 3 = neutral 4=agree 5=strongly agree

S.No	Dimension	Explanation	1	2	3	4	5
1	Leadership	Project Manager (PM) provide direction and motivate others in their role or task to achieve the projects' objectives in HVPTSP of EEP					
2	Management Skills	PMs effectively administers the project through deployment and use of human, financial, material, intellectual and intangible resources.					
3	Communication skill	PMs in HVPTSP of EEP effectively exchanges accurate, appropriate and relevant information with stakeholders using suitable methods.					
4	Cognitive Ability	Appropriate depth of perception, discernment and judgment to effectively direct a project in changing and evolving environment.					
5	Effectiveness	PMs in HVPTSP of EEP produces desired results by using appropriate resources, tools and techniques in all project management activities.					
6	Professionalism	PMs confirm to an ethical behavior governed by responsibility, respect, fairness and honesty in the practice of project management.					

7	Engagement	PMs in HVPTSP of EEP have personal commitment to involve every team members to projects achievement.					
8	Self-Control	PMs in HVPTSP of EEP have a systematic and disciplined approach to cope with daily work, changing requirements and to deal with stressful situations.					
9	Assertiveness	PMs in HVPTSP of EEP have the ability to state their views persuasively and authoritatively.					
10	Participatory ability	PMs in HVPTSP of EEP have the ability to make project team members feel welcome to express themselves.					
11	Creativity	PMs in HVPTSP of EEP the ability to think and act in original and imaginative ways.					
12	Results Orientation	PMs in HVPTSP of EEP guide the project parties attention to focus on key objectives to obtain the optimum outcome.					
13	Efficiency	Have the ability to use time and resources cost- effectively to produce the agreed project deliverables and fulfill interested parties' expectations.					
14	Consultation	Have the competence to reason, to present solid arguments, to listen to the other point of view, to negotiate and to find solutions.					
15	Negotiation skill	PMs in HVPTSP of EEP have the means by which parties can resolve disagreements concerned with the project or program to arrive at a mutually satisfactory solution.					
16	Conflict & Crisis management	Have the ways of handling conflicts and crises that can arise between different individuals and parties involved in a project or program.					
17	Reliability	PMs in HVPTSP deliver what they have said to the time and quality agreed within the project specification.					
18	Value Appreciation	Have the ability to perceive the intrinsic qualities in other people and understand their point of view.					
19	Ethical behavior	Have morally accepted conduct or behavior					

VI. SENIOR MANAGERMENTS' SUPPORT

Please consider the senior managements' support in HVPTSPs of EEP in which you participated and choose the number that best describes your judgment on the following scale.

1=strongly disagree 2=disagree 3 = neutral 4=agree 5=strongly agree

No	Dimension	Explanation	1	2	3	4	5
1	Resources	Senior management (SM) provided sufficient resources to complete the project successfully					
2		SM provided sufficient resources to the project team in crises					
3		SM ensured availability of sufficient resources to provide a supportive stakeholder environment for the accomplishment of the project					
4		SM provided sufficient resources to support system adaptations in the organization					
5		SM provided adequate resources for effective system implementation to institute organizational change					
6	Structural Arrangement	SM ensured implementation of appropriate project structures to accomplish project objectives					
7		SM strengthened stakeholder support in the organization					
8		SM adapted appropriate structures processes, and controlling procedures to implement organizational change					
9		SM focused on strategic and structural planning to improve organizational efficiency					
10	Level of Expertise	SM possessed relevant experience and expertise in project management					
11		SM recognized the importance of project implications, system implementation and organizational change					
12		SM recognized the necessity of system adaptation in the organization					
13		SM recognized the interest and power of project stakeholders					
14		SM encouraged the project team to enhance project efficiency and organizational performance					

15	Power	SM used its power to implement critical system changes in an organization towards implementation of projects					
16		SM exercised its authority to support the team members during implementation of project activities					
17		SM often used its power to implement best project management practices in the organization					
18		SM exercised its authority to define unambiguous roles and responsibilities of project stakeholders					
19		SM ensured effective system implementation to institute organizational change for success of projects					

VII. PROJECT SUCCESS

Please consider the success of HVPTSPs in EEP in which you participated and choose the number that best describes your judgment on the following scale.

1=strongly disagree 2=disagree 3 = neutral 4=agree 5=strongly agree

No	Dimension	Explanations	1	2	3	4	5
1	Time	Majority of the activities within HVPTSPs of EEP are completed on schedule					
2		In most cases the actual schedule of the projects activities for each phase of HVPTSP were the same as planned schedule					
3		Milestone in HVPTSPs of EEP were completed according to the planned schedule					
4		HVPTSPs of EEP were completed and operational on time according to planned.					
5	Cost	The actual cost for each stage and work breakdown of the HVPTSPs of EEP were essentially the same as budgeted					
6		Total actual cost of HVPTSPs in EEP were essentially the same as budgeted or contract amount.					
7		There is no significant change with respect to the total in budgeted cost and actual cost in HVPTSPs of EEP.					
8	Quality	HVPTSPs were completed according to the quality requirement of EEP.					

9		HVPTSPs' quality were accomplished according to the projects requirements					
10		The overall quality objectives of HVPTSPs were achieved					
11	Project objective	The completion HVPTSPs of EEP have achieved the required project objective.					
12		Internal and external stakeholders were satisfied on the deliverables and completion of HVPTSPs					
13		HVPTSPs met their technical performance goals					
14		HVPTSPs met their operational performance goals					