

**An Evaluation of the Success Factors Influencing Communication
Management Systems in Ethiopia's Construction Industry From a
Contractor Perspective**



Bitset Gizaw Abdo

A Thesis Submitted to the Department of Civil Engineering

School of Civil Engineering and Architecture

**Presented in Partial Fulfillment of the Requirement for the Degree of
Master's in Construction Management Engineering,**

Office of Graduate Studies

Adama Science and Technology University

May, 2024

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DECLARATION

I hereby declare that this Master Thesis entitled “**An Evaluation of the Success Factor Influencing Communication Management Systems in Ethiopia's Construction Industry From a Contractor Perspective**” is my original work. That is, it has not been submitted for the award of any academic degree, diploma, or certificate in any other university. All sources of materials that are used for this thesis have been duly acknowledged through citation.

Bitset Gizaw

Name of student

Signature

Date

RECOMMENDATION

I, the advisor of this thesis, hereby certify that I have read the revised version of the thesis entitled “**An Evaluation of the Success Factor Influencing Communication Management Systems in Ethiopia's Construction Industry From Contractor Perspective**” prepared under my guidance by **Bitset Gizaw**, submitted in partial fulfillment of the requirements for the degree of Masters of Science in construction engineering management. Therefore, I recommend the submission of a revised version of the thesis to the department following the applicable procedures.

Lemma Beressa (PhD)

Major Advisor

Signature

Date

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I, the advisor of the thesis entitled “**An Evaluation of the Success Factor Influencing Communication Management Systems in Ethiopia's Construction Industry From Contractor Perspective**” developed by **Bitset Gizaw**, hereby certify that the recommendations and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

Lemma Beressa (PhD)

Major Advisor

Signature

Date

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We, the undersigned, members of the Board of Examiners of the thesis by Bitset Gizaw have read and evaluated the thesis entitled “**An Evaluation of the Success Factor Influencing Communication Management Systems in Ethiopia's Construction Industry From Contractor Perspective**” and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Science in Construction Engineering and Management.

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LIST OF ACRONYMS

ASTU	Adama Science and Technology University
GDP	Growth Domestic Product
GC1	Grade One Contractors
MOWUD	Ministry of Urban Development and Construction
OWNP	One Wash National Program
SM	Social Media
WEF	World Economic Forum
PLC	Public Limited Company

ABSTRACT

Ethiopia's construction sector plays a vital role in the country's economic growth but faces significant challenges in communication among stakeholders. These challenges often lead to inefficiencies and project delays. This study specifically focuses on Grade One contractors in Addis Ababa to explore the key factors that influence effective communication management systems in Ethiopia's construction industry. Using structured surveys, we gathered quantitative data from 49 respondents. The study combined this primary data with insights from existing literature. The surveys focused on the main determinants of effective communication, their impacts, and the challenges encountered. We analyzed the data using the R-cram software tool. Our findings highlight several crucial factors for effective communication, including clearly defined roles, regular meetings, and strong project leadership, with average importance ratings of 3.47, 3.33, and 3.27, respectively. Most participants agreed that using modern communication tools, ensuring proper resource allocation, and maintaining continuous feedback mechanisms can significantly enhance stakeholder satisfaction, project efficiency, and overall industry performance. In conclusion, tackling these key factors can greatly improve the effectiveness of communication management systems in Ethiopia's construction industry.

Keywords: communication, construction industry, cost, time, stakeholder, key determinants

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

The construction industry makes an important impact on the advancement of society in many ways, and by creating jobs, it contributes a significant role to the GDP and supports nearly all other sectors as well (WEF.2016). In the case of Ethiopia, the construction sector share also a substantial role in the GDP. The construction sector receives 60-65% of the annual capital budget, which has been between 8 and 10% since 2012. Its contribution to job creation is the largest, second only to the farming industry (WEF. 2016, n.d.).

Many people believe that for design and construction teams to take the entire lifecycle of the construction process into consideration, collaborative working is imperative (Shelbourn et al., 2007). To stay competitive and satisfy its ever demanding clients, the construction sector is now seen as needing to adopt new working practices for the twenty-first century(Shelbourn *et al.*, 2007).

According to (Akintoye & Main, 2007), the delivery of construction projects has seen a rapid change in recent years, with a focus on joint ventures, strategic alliances, public/private partnerships, and partners. It is acknowledged that the provision of public sector services like roads, trains, telecommunications, electricity, water, and waste treatment, among others, depends on the application of project financing strategies. Higher levels of cooperation between the public and private sectors as well as among private sector stakeholders are required by these innovative procurement methods.

All stakeholders engaged in a construction project aim to achieve project success (Safapour, Kermanshachi, & Kamalirad, 2020). So a project's success is largely dependent on the effectiveness of communication because, during its execution, a lot of information is shared by and for many parties (Gamil & Rahman, 2017). In the construction sector, information about projects is shared widely and inclusively during the planning and execution phases of the project. Every time a project is carried out by people and involves human interaction, communication is crucial. Research findings indicate that project managers dedicate approximately 90% of their time to communicating with the stakeholders involved in the project (Ksenija Čulo, 2001).

This paper focused on finding key determinants of effective communication in the construction industry, with a focus on Grade One category contractors.

1.2. Statement of the Problem

There is considerable concern about how well the construction sector's communication management systems work (Gudeta, 2020). These management systems are crucial to project success. However, contractors' and stakeholders' perceptions of the critical factors influencing their efficacy are not well understood (Gebbru, 2021). Thus, this gap makes it more difficult for the sector to maximize effective communication systems in projects, which could result in defects, delays, and inadequate project results. Many obstacles stand in the way of the adoption and use of effective communication management systems in Ethiopia's construction sector (Mengistu *et al.*, 2020). To address critical issues affecting project performance and economic growth in the industry, stakeholders must have an in-depth knowledge of the key determinants affecting the effectiveness of these systems. Thus, research is needed to conduct a systematic evaluation and analysis of these determinants.

Ineffective communication during construction projects can lead to errors and failure. Standard documentation and effective communication are essential for project development to avoid delays. Effective communication among project teams is crucial for resolving construction and design issues and ensuring project success (Adejoke *et al.*, 2016). This study aims to identify factors influencing effective communication among project teams, as well as communication channels and processes in Ethiopia's construction industry.

1.3. Research Questions

1. What are the key determinants of effective communication systems in the Ethiopian construction industry?
2. What are the impact of effective communication systems in the construction industry?
3. What are the main challenges contractors face when implementing and maintaining effective communication management systems in construction projects?
4. What recommendation can be proposed to improve communication management practices in the Ethiopian construction industry?

1.4. Objectives of the Study

1.4.1. General Objective

To investigate and evaluate the critical factors influencing the effectiveness of communication management systems in the construction sector.

1.4.2. Specific Objectives

- To assess the determinant factors that impact effective communication in the construction industry.
- To evaluate the impact of effective communication management systems.
- To assess the challenges encountered by contractors in implementing effective communication systems in the construction industry.
- To make recommendations for improving communication management practices in the construction industry.

1.5. Scope of the Study

This study investigates the key determinants of effective communication systems in the Ethiopian construction industry, their impact on the construction industry and challenge they face in implementing this key determinant factors. Due to this, the study's scope is limited to Grade One Contractors who work in Addis Ababa city.

1.6. Significance of the Study

This study is significant because it addresses and improves several critical issues in the construction industry, which will benefit Grade One Contractors in particular and the building industry as a whole. Additionally, it maintains its ability to improve the construction industry in a specific setting and deal with major issues. Here are some potential effects:

- Help to improve communication, and overall efficiency within the industry.
- Lead to improved coordination among various teams, subcontractors, and other relevant stakeholders.
- Communication breakdowns and teamwork problems are common causes of delays in construction projects. The construction industry can enhance its overall efficiency by minimizing delays through the development of strategies aided by an understanding of the key determinants.

This research can contribute to the industry's competitiveness by identifying and promoting best practices in communication management system.

1.7. Limitations of the Study

The limitation of this research was the lack of available local literature about the key determinant factor of the basic limitation that precluded the researcher from further in-depth research on the topic, and the study focused specifically on Grade one contractors working in Addis Ababa. As a result, the findings are not generalizable to other regions or types of contractors within Ethiopia. The unique characteristics and practices of contractors in other locations or at different levels of classification.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This literature review is the collection of background information on the research study, which aims to consolidate all previous studies related to the research topic from an understanding of the current practice and a comprehensive literature review helps researchers to identify research gaps through critical thinking while reading existing works (Kothari, 2004). This chapter provides a comprehensive literature review to identify the key determinant factors of effective communication systems and to gain a clear understanding of their impact on the construction industry.

2.2. General Overview of Communication Management Sytem

The word 'communication' is derived from the Latin word 'communis' which translates as 'to make common (Othman *et al.*, 2018). It can be described as the process of sharing knowledge and understanding between individuals (Keyton, 2010). Nevertheless, it is challenging to define "communication" because it is such a multifaceted and ill-defined term. It can have a wide range of meanings, contexts, forms, and effects, so it will signify different things to different people in different circumstances. This is undoubtedly the case in the construction sector (Dainty *et al.*, 2006).

In construction industry, communication is essential to the success and efficiency of projects. Individuals can achieve things that would not be possible on their own when they communicate and work toward a common objective. However, working together is not always easy in the construction industry. Diverse skill sets, viewpoints, and objectives are frequently brought to the table by teams. This may impede the ability to come to an agreement and cause conflict at work. Furthermore, there can be a "silo" mentality in the construction industry where teams withhold ideas and resources from one another due to competition. This keeps cooperation from ever starting in the initial position (Kolosowski *et al.*, 2023).

In construction, communication has many advantages despite these challenges. Increased productivity, decreased rework, and less resource waste are all possible in a collaborative team setting. It can also result in more creative projects, increased safety on the job site, improved client relationships, and informed decision-making. Teams must find it simple to

obtain project plans, objectives, and resources to have a successful project. They also need to be equipped with the procedures and instruments required to promote cooperation in to projects (Kolosowski *et al.*, 2023).

According to Kliem, (2007), the process of communication aligns with the sender, receiver, message, and medium. First, the person sending it creates the message to be sent to the receiver, who is then informed and deals with the message appropriately. Furthermore, the medium of communication can be in any format relevant to the project environment, and the message is at the heart of this process because it establishes an interaction between the person who sends it and the person who receives it.

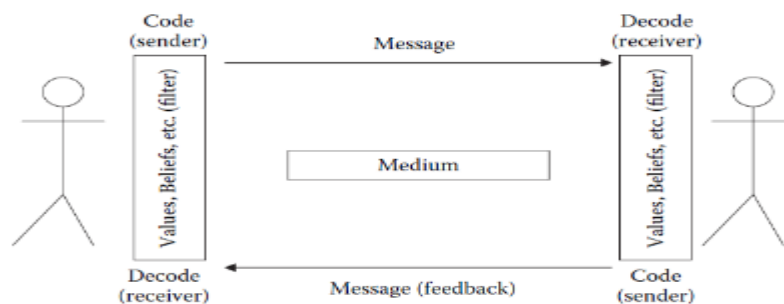


Figure 2-1: Process of communication (Kliem, 2007).

Effective communication ensures that the four components of the communication process listed above operate properly, that the recipient understands the message, and that the necessary needs and outcomes are eventually satisfied. Projects in the construction industry can also benefit from this, as successful communication among project participants is a critical component (Talukhaba *et al.*, 2011). When all project participants are aware of and effectively complete their tasks and responsibilities to meet project goals, effective communication results. Using proactive and efficient communication techniques is a tried-and-true way for project managers to get through obstacles and difficult times. The project manager must identify the messages that must be sent correctly, to whom they should be sent, and how to interpret them so that the recipient can understand them (Raynold *et al.*, 1983).

2.3. Communication Systems in Ethiopia's Construction Industry

The Ethiopian construction management industry has witnessed significant growth, driven by increased investments in infrastructure and urban development. However, contractors face several challenges that impact project delivery, efficiency, and quality. One major issue

is inadequate project management practices, characterized by poor planning and scheduling, which often lead to delays and cost overruns (Gebru, 2021). The lack of skilled project managers and standardized project management methodologies further exacerbates these problems. Additionally, traditional construction methods and tools continue to dominate the industry, limiting the potential for improved efficiency and productivity (Mengistu & Mahesh, 2020).

Effective communication among stakeholders is crucial for the successful execution of construction projects. However, Ethiopian contractors often struggle with fragmented communication channels and a lack of integrated project management systems. Poor communication leads to misunderstandings, delays, and rework, negatively affecting project outcomes. The adoption of advanced communication tools, such as project management software and regular stakeholder meetings, can significantly enhance communication and transparency. Furthermore, clear role definitions and continuous feedback mechanisms are essential for minimizing misunderstandings and improving overall project coordination (Abadi, 2020).

2.5. Key Determinants of Effective Communication Management System

(Baldwin et al., 1999), in their dissertation, presented that effective communication is crucial in construction, not only among team members but also throughout the project life cycle. Construction projects are becoming more globalized and complex, requiring partners from diverse locations, including multiple cities. And face-to-face meetings become more costly, time-consuming, and inconvenient. They also discuss that effective communication protocols that can overcome time and distance constraints are necessary.

This necessitates improved communication between the various stages and activities of the process, as well as among project team members. Thus, there is a need for greater discipline in the creation, deception, preservation, and exchange of design information. construction project information takes many forms, both graphical and non-graphical, necessitating clear communication between team members. As a result, traditional paper-based methods fail to meet the demands for quick, accurate, user-friendly, adaptable, visually enhanced, and well-coordinated interactions required for effective collaboration (Baldwin *et al.*, 1999).

2.5.1. Communication Management Sytem Tools

Tools for communication and collaboration are programs or online spaces created to help people connect, share, and work together regardless of where they are physically located.

These instruments comprise an extensive array of functions and offerings, all of which fulfill distinct roles in cooperation and communication (Claassen *et al.*, 2022). Nowadays Social media applications in construction projects are used to enhance both inside and outside interaction between stakeholders. Construction companies are using social media in their projects because it allows instantaneous interaction with rich content consisting of paperwork, pictures, video clips, and even arguments that can be had quickly. Numerous other potential benefits of social media, like improved safety as well as expense savings with effective leadership, also have been covered (Zainal *et al.*, 2020).

According to (Hysa, 2019), SM can support construction project management work, in the following areas: communication, collaboration, engagement, management of knowledge, and work productivity fields. (Kietzmann *et al.*, 2012) develop a framework of social media features that explains how social media helps with managing interactions. These types of designs are:

The "presence" feature denotes the extent to which users are aware of other users' locations and accessibility. The "relationships" feature denotes the degree to which users share information and are related to one another. As a result, these connections can foster the growth of user trust. The "reputation" feature forecasts conduct by utilizing historical actions. It concerns the establishment, maintenance, and assessment of trust. The "groups" feature indicates how much an individual contributes and interacts with others in a particular group environment. The "conversation" feature operates the level at which individuals interact with each other through social media. In a collaborative, interactive social media setting, users engage in either "one-way" or "multi-way" conversational content. The term "sharing" functionality refers to the degree of information that can be transferred between users. The "identity" feature pertains to the degree to which individuals will participate to reveal who they are while engaging with content on social media platforms.

Accurate, concise, and clear communication is essential. Each of these characteristics must be considered when the information is translated. Information content has an impact on the encoding process. A shared frame of reference and mutually understood code between the sender and the recipient are essential for effective and meaningful communication. This code is not limited to only numbers or text. It might take the form of designs, signs, symbols, charts, and images (Lee *et al.*, 2018).

Table 2-1: The purpose of communication in construction (Lee *et al.*, 2018).

Purpose	Description	Example
For Instruction	to enable an individual or a group to accomplish particular tasks	Specifications, Weekly Meetings
For Consolidation	to bring about interrelationship among various project participants	Project Meetings
For Information	to inform an individual or a group about particular tasks, policies, or procedures	Daily Reports, RFIs
For Evaluation	to examine tasks performed by an individual or a team	Checklists
For Direction	To issue directions by top management or manager to the lower level	Construction Change Directives
For Training	to teach or educate workers about particular tasks, policies, or procedures	Toolbox Talks
For Influence	to persuade others	Submittals, Change Order Requests
For Image Building	to project the image of the firm in the society	Vision and Mission Statements
For Orientation	to help people acquainted with others and with policies, objectives, rules, and regulations	kick-Off Meeting

2.5.2. Communication Process

Regular meetings and discussions among project teams are essential for promoting efficient communication. It is crucial to have frequent and transparent communication in an industry where projects involve multiple stakeholders, intricate tasks, and constrained timeframes. Regular meetings allow team members to discuss updates, resolve issues, and make clear expectations in real time, which minimizes misunderstandings and lowers the possibility of expensive mistakes or delays. These gatherings provide a forum for idea sharing, dispute resolution, and cooperatively reaching well-informed decisions all of which are essential for the accomplishment of building projects (Justus *et al.*, 2019).

Safapour, (2020), added that frequent meetings and conversations help the different trades, suppliers, and subcontractors that work on construction projects. These meetings facilitate cross-functional collaboration and effort integration by bringing together representatives from various disciplines, including engineers, architects, contractors, and suppliers. In the planning and execution stages of construction projects, when several tasks must be coordinated to guarantee smooth progress and timeline adherence, coordination is especially important. Teams can improve overall project efficiency and success by anticipating problems, proactively addressing issues before they escalate, and identifying potential conflicts through effective communication and coordination.

Additionally, frequent meetings give construction teams a platform for developing a cooperative culture that encourages openness, trust, and accountability among team members. Meetings that foster open communication and active participation from all parties involved foster an atmosphere where ideas are appreciated, criticism is welcomed, and group problem-solving is encouraged. This cooperative method not only raises team spirit and involvement but also gives people the confidence to own their roles and make a positive impact on the project. In the end, construction teams can strengthen their bonds, reduce risks, and produce excellent results that either meet or surpass stakeholders' expectations by making frequent meetings and discussions a priority in their communication strategy (Safapour, 2020).

Construction teams can also cultivate a culture of continuous improvement by conducting regular monitoring and evaluations. (Callistus *et al.*, 2018) This allows the strategies for communication to be improved and tailored to the project's changing requirements. Construction teams can make sure that their communication efforts are still effective and

pertinent to stakeholder needs by investing in communication skills training and capacity building. In addition, regular evaluations facilitate the assessment of the influence of communication endeavors on project results, pinpoint opportunities for enhancement, and guarantee that communication plays a role in accomplishing project goals (Callistus Tengan, 2021).

According to (Elnaz *et al.*, 2020), improving the efficacy of communication and collaboration in construction projects requires ongoing monitoring and assessment of the processes involved. Construction teams can improve project outcomes by identifying areas for improvement, promptly addressing issues, and making data-driven decisions by routinely reviewing and evaluating their communication efforts. To make sure that communication efforts are in line with project objectives and stakeholder needs, effective monitoring and evaluation practices include tracking communication outputs, gauging audience engagement, holding surveys and focus groups, and assessing communication outcomes.

The smooth integration of diverse stakeholders via easily accessible communication systems is essential for effective communication in construction projects. Regardless of where they are physically located, project participants can stay connected, informed, and involved thanks to these tools, which also make it easier to track progress and make decisions in real time. Construction teams can boost coordination, increase collaboration, and guarantee that all stakeholders are informed and involved in project discussions by utilizing technology and digital platforms for communication. This will ultimately result in successful project outcomes and satisfied clients (Minura *et al.*, 2021).

Table 2-2: Training on communication practices (Tairu *et al* 2016)

Aspect of Training	Importance	Benefits
Development of Communication Skills	Improves the capacity for effective team communication, attentive listening, and information sharing.	Minimizes misinterpretations and errors in communication. Enhances stakeholder alignment and coordination. Encourages the sharing of opinions and ideas.
Training on Communication Techniques	Teaches conflict resolution techniques, teamwork techniques, and collaborative culture promotion.	Improves cooperation and support between project participants. Promotes honest communication and helpful problem-solving. Builds unity and trust among the project team members.

Technology proficiency training	Teaches how to use tools for collaboration and communication efficiently.	Increases production and efficiency by utilizing technology for document management and communication. Makes certain that each team member is adept at using various platforms for collaboration and project management software. Lessens reliance on conventional communication techniques, which speeds up problem-solving and decision-making.
Role-specific Communication Training	Adapts instruction to the unique communication requirements of various project roles, such as project managers, contractors, and subcontractors.	Makes certain that every stakeholder is aware of their communication duties within the project. Enables focused dialogue and information exchange pertinent to every position. Improves role accountability and clarity, which facilitates more efficient project execution.

2.5.3. Stakeholder's Involvement

The present state of the construction industry is evolving quickly due to continual shifts in technology and the magnitude of projects. The emphasis of this new construction project conditions framework is on collaboration, partnership arrangements, partnerships between the public and private sectors, and collaborative relationships (Rahman et al., 2014a). Conversely, for a very long time, the construction industry has been marked by mistrust, aggressive attitudes, and uncertainty. As a result, collaboration between the project's stakeholders fosters continuous development, fosters innovation, and technical advancement, and raises the importance and certainty of work. In this regard, research has highlighted several advantages of cooperation in managing construction projects, including stakeholder management (Rahman *et al.*, 2014).

Office Breakdown Structure

Smother collaboration within construction projects is greatly enhanced by clearly defined roles and responsibilities. Establishing defined roles and responsibilities helps reduce confusion, minimize conflicts, and improve overall project efficiency in an industry that is typified by complex projects involving multiple stakeholders, each with specialized skills and expertise. Teams may improve communication, remove uncertainty, and make sure that everyone knows their part in accomplishing project goals by outlining precisely who is responsible for what decisions and tasks. Team members can work more cohesively toward shared objectives when there is greater clarity, which improves coordination and alignment (Ingelmo *et al.*, 2018).

Moreover, roles and responsibilities that are well-defined encourage accountability and empowerment in construction teams. Individuals are more likely to take responsibility for their work and actively contribute to the project's success when they are aware of their precise responsibilities and areas of authority. A culture of responsibility and professionalism is fostered by this sense of accountability, which inspires team members to produce excellent work and adhere to project standards. Furthermore, because there is less need for constant supervision or approval from higher levels of management, clear role definitions speed up problem-solving and decision-making by enabling individuals to make decisions within their assigned scope of work (Olaniran, 2015).

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Furthermore, by offering a structure for interaction and coordination, defined roles and duties promote efficient communication and teamwork. Team members can communicate effectively, ask for help, and quickly resolve problems when they know who to consult or work with on particular tasks or issues. This methodical approach to cooperation lessens the possibility of misunderstandings or effort duplication, which facilitates project execution and produces better results. All things considered, construction teams can improve communication, encourage teamwork, and eventually have more success completing projects on schedule and under budget by clearly defining roles and responsibilities (Talukhaba *et al.*, 2011).

Improving the efficiency of communication and collaboration in construction projects requires the participation of all pertinent stakeholders in these processes. Project goals, timelines, and expectations are ensured when all stakeholders, including architects, engineers, contractors, subcontractors, and clients, actively participate in communication and collaboration efforts. Construction teams can promote a culture of transparency, shared responsibility, and mutual understanding by involving all pertinent parties. This can facilitate project execution and lower the likelihood of mistakes or misunderstandings (Ismail n.d, 2019).

The exchange of essential information, concepts, and feedback amongst all project participants is made possible by the effective engagement of stakeholders in communication and collaboration processes. This proactive involvement reduces misunderstandings, expedites problem-solving, and facilitates timely, well-informed decision-making. Construction teams can foster a collaborative environment where stakeholders feel appreciated, heard, and empowered to contribute to the project's success by creating clear communication channels and promoting open dialogue (Ismail n.d, 2019).

Additionally, it fosters unity, teamwork, and collective problem-solving within the construction project when all pertinent stakeholders actively participate in communication and collaboration processes. Building projects can gain from creative solutions, effective resource allocation, and risk mitigation techniques by utilizing the varied experiences and viewpoints of team members. This inclusive approach not only improves project outcomes but also cultivates a culture of continuous improvement and success in construction endeavors by fortifying relationships and fostering trust(Musheke *et al.*, 2021).

2.5.4. Project Leadership

When it comes to construction projects, effective communication, and collaboration are crucial because timely completion and high-quality results depend on precise coordination. Enhancing these aspects is largely dependent on mutual respect and trust. Members of a trusting team communicate more honestly and freely, willingly disclosing information that is essential to the project's advancement. The presence of trust reduces misinterpretations and promotes efficient communication among diverse groups and interested parties. In addition, mutual respect creates a setting where each person's opinion is respected, which motivates people to actively participate in conversations and brainstorming sessions. When there is such a respectful environment, ideas flow freely and creative solutions to challenging construction problems are produced (Anita n.d, 2014).

In addition, mutual respect and trust strengthen teamwork, making it possible for members to work together productively toward common objectives. In the construction industry, for example, where tasks are frequently interdependent, teamwork is crucial for coordinating efforts and meeting deadlines. Members of a collaborative team are more likely to work closely together, utilizing one another's strengths to overcome challenges and maximize project results. This collaborative attitude also fosters synergy between various teams, including contractors, architects, and engineers, and ensures a cohesive project environment where all parties strive towards a shared vision (Edison n.d, 2021).

Eventually, mutual respect and trust work together to foster an environment that is favorable to productive teamwork and communication during building projects. Teams that put these values first are better able to handle complexities, confront problems early on, and adjust quickly to changing conditions. Construction projects can fully utilize their teams' potential by establishing a culture of mutual respect and trust. This will facilitate project execution, produce better outcomes, and ultimately increase project success (Anita n.d, 2014).

Allocation of Resource

Achieving successful results in construction projects requires allocating resources, including time, money, and staff, to communication and teamwork initiatives. Throughout the project lifecycle, effective and open communication channels are ensured by the adequate allocation of these resources. Teams can stay informed and in sync by setting aside time for regular meetings, discussions, and progress reports. This promotes better coordination and decision-making. In a similar vein, setting aside enough money for technology and communication tools allows teams to take advantage of cutting-edge platforms for information sharing, progress monitoring, and real-time problem solving, all of which improve teamwork effectiveness (Friebel *et al.*, 2009).

Additionally, assigning the appropriate staff to coordination and communication tasks guarantees that groups have the knowledge and assistance needed to successfully manage intricate project dynamics. Assigning capable people to serve as project coordinators or communication focal points facilitates communication, controls information flow, and expedites dispute resolution. Furthermore, having specialized staff for team-building activities and facilitation of workshops fosters greater collaboration and synergy among project stakeholders. Construction projects can leverage the collective knowledge and experience of their teams by investing in the right human resources, which will result in more creative solutions and better-quality results (Latif, 2023).

In the long run, it is impossible to exaggerate the beneficial effects of wise resource allocation on construction project outcomes. Initiatives that place a high priority on teamwork and communication by providing enough time, money, and staff resources are better able to overcome obstacles, adjust to changing circumstances, and produce outcomes that either meet or surpass stakeholders' expectations. Construction teams can increase productivity, reduce risks, and ultimately succeed in completing projects on schedule, within budget, and to the required quality standards by investing in these crucial project management components (Friebel *et al.*, 2009).

Oppeness and Transparency

Improving the efficacy of communication and collaboration in construction projects is contingent upon the project stakeholders' transparency and openness. Construction teams can establish trust, encourage accountability, and guarantee that all stakeholders are informed and involved at every stage of the project by cultivating a transparent culture. Clear

lines of communication between stakeholders allow for the open exchange of information, worries, and suggestions, which improves decision-making, reduces risk, and aligns project objectives. Being transparent in communication not only facilitates early problem-solving but also fosters teamwork, creativity, and ongoing development among construction team members (Ayodeji Emmanuel Oke, 2017).

Transparency and openness are key components of effective communication strategies that can improve project outcomes, lower errors, and increase efficiency in construction projects (Ayodeji Emmanuel Oke, 2017). Through the establishment of unambiguous channels of communication with various stakeholders such as clients, architects, engineers, contractors, and subcontractors, construction teams can guarantee the management of expectations, early identification of potential issues, and timely adjustments. Effective communication techniques also help to create a collaborative atmosphere, strong bonds, and a sense of shared accountability among project participants, all of which are necessary for the project to be completed successfully and for the client to be satisfied (Ismail Fakhro, 2019).

Project Leadership

According to (Amr Sukkar, 2024), in construction projects, effective communication and collaboration initiatives are driven by project leadership and management support. Effective leadership establishes a collaborative culture, guarantees that all stakeholders are working toward the same project goals, and sets the standard for open lines of communication. Project managers can enable teams to communicate effectively, handle problems quickly, and collaborate smoothly to complete a project by offering direction, tools, and support for good communication techniques.

Setting clear expectations and actively participating in communication processes are essential components of effective project leadership support for collaboration and communication initiatives. Effective communication is emphasized by leaders who set an example for the entire project team by holding frequent meetings, giving constructive criticism, and encouraging teamwork. Project leaders can establish a favorable atmosphere where communication is unrestricted, cooperation flourishes, and project results are maximized by supporting open and honest communication methods, promoting teamwork, and adopting cutting-edge tools and technologies (Hala Taleb, 2017a).

2.5.5. Communication and Collaboration Protocols and Procedures

The implementation of uniform communication protocols and procedures is crucial in enhancing the efficiency of communication and cooperation in construction projects. Before the establishment of uniform procedures, there may have been a lack of organization in the communication between construction teams, which resulted in a lot of miscommunication and misunderstandings. However as standardized protocols are established, communication gets more organized and predictable. Ensuring that all stakeholders are informed and in alignment with clear guidelines regarding communication channels, formats, and frequency improves clarity throughout the project lifecycle. This clarity lessens the possibility of misinterpretations that might otherwise impede progress or result in expensive mistakes (Dayton & Henriksen, 2007).

The implementation of uniform communication protocols and procedures is crucial in enhancing the efficiency of communication and cooperation in construction projects. Prior to the establishment of uniform procedures, there may have been a lack of organization in the communication between construction teams, which resulted in a lot of miscommunication and misunderstandings. However as standardized protocols are established, communication gets more organized and predictable. Ensuring that all stakeholders are informed and in alignment with clear guidelines regarding communication channels, formats, and frequency improves clarity throughout the project lifecycle. This clarity lessens the possibility of misinterpretations that might otherwise impede progress or result in expensive mistakes (Dayton & Henriksen, 2007).

Standardized communication protocols also foster an environment of accountability and trust among project participants. There is a level playing field with well-defined roles and expectations when everyone adheres to the same set of procedures. Members of the team gain trust in one another and the dependability of the channels of communication as a result of this transparency. Stakeholders are therefore more likely to cooperate well, exchange information honestly, and work together to complete projects on time. In the end, standardized communication protocols greatly aid in the success of construction projects by improving clarity, efficiency, and trust, allowing for more seamless execution and better results (Dayton & Henriksen, 2007).

Feedback Mechanism

Also according to Ana Bovan, (2020), frequent feedback mechanisms are an excellent way to improve teamwork and communication in construction projects. These mechanisms aid in identifying communication gaps and areas for improvement by offering a structured framework for gathering opinions and insights from team members, clients, and other stakeholders. Project teams can obtain important information about the efficiency of channels of communication, the comprehensibility of messages, and the general dynamics of collaboration through feedback loops set up at significant project milestones, as well as through continuing surveys and meetings. Teams can promptly address issues and modify their communication strategies in response to changing project requirements because of the feedback they receive, which acts as a catalyst for continuous improvement (Ana Bovan, 2020).

Furthermore, frequent feedback systems encourage an open and accountable culture in construction teams. Stakeholders feel more empowered to actively contribute to the project's success when they are given the chance to freely express their opinions and concerns. Project teams can increase relationships with external partners and develop trust by fostering a safe space where feedback is appreciated and welcomed. This openness promotes sincere communication and a feeling of group ownership over project results, which in turn promotes increased teamwork and dedication to common objectives (Ana Bovan, 2020).

Ana Bovan, (2020) added also regular feedback mechanisms' iterative nature enables construction teams to improve their teamwork and communication techniques over time. Teams can identify patterns, trends, and reoccurring issues as feedback is gathered, examined, and responded to. This allows them to make specific adjustments and interventions. The insights obtained from feedback mechanisms enable teams to continuously optimize their collaboration strategies, whether they involve strengthening interpersonal communication skills, streamlining documentation procedures, or defining roles and responsibilities. In the end, construction projects can attain greater success, productivity, and efficiency by adopting a feedback-driven approach, guaranteeing that communication stays a vital component of project excellence.

For teams to collaborate and communicate effectively on construction projects, communication systems must be flexible and adaptable. This allows teams to adjust to changing conditions and demands as the project progresses. Construction teams can make

sure that information flows smoothly, decisions are made quickly, and problems are resolved effectively even as project requirements change by putting in place communication systems that are simple to scale and modify (Namhun, 2018).

Construction teams can adapt their approach in response to feedback and shifting priorities thanks to flexible communication systems. This can entail implementing new platforms for communication, like mobile apps or real-time collaboration tools, to enable real-time updates and feedback from the field. Additionally, it might be necessary to modify the language, tone, and degree of detail in communications to accommodate the requirements of various stakeholders, including subcontractors and clients. (Namhun Lee, 2018) Construction teams can cultivate a culture of transparency, responsiveness, and continuous improvement by adhering to a flexible and adaptable communication approach. This will ultimately improve project outcomes and client satisfaction.

According to (Callistus Tengan, 2018), improving the efficacy of communication and collaboration in construction projects requires ongoing monitoring and assessment of the processes involved. Construction teams can improve project outcomes by identifying areas for improvement, promptly addressing issues, and making data-driven decisions by routinely reviewing and evaluating their communication efforts. To make sure that communication efforts are in line with project objectives and stakeholder needs, effective monitoring and evaluation practices include tracking communication outputs, gauging audience engagement, holding surveys and focus groups, and assessing communication outcomes.

2.6. The Impacts of Key Determinants of Effective Communication Management Systems

2.6.1. Cost Impact

2.6.1.1. Reduction in Errors and Rework

Reducing errors and reworking in construction projects largely depends on efficient communication and collaboration systems. By implementing effective communication protocols and promoting a cooperative atmosphere, project teams can optimize their effectiveness and output while reducing the likelihood of mistakes that frequently result in additional work. Project requirements, modifications, and specifications are effectively communicated when there is open and transparent communication among stakeholders, which lowers the possibility of misunderstandings and mistakes. Contrarily, collaboration

promotes shared accountability and teamwork, enabling groups to combine their knowledge and experience to recognize issues and find effective solutions, resulting in less rework (Safapour, Kermanshachi, & Kamali Rad, 2020a).

In addition, a well-organized system for collaboration and communication in construction projects facilitates smooth information exchange, coordinated efforts across various project teams and departments, and real-time updates. Because everyone on the team is aware of the most recent project developments, there is less need for rework and faster issue resolution thanks to this efficient communication process that also improves project timeline adherence. Project teams can minimize errors and the need for rework by exchanging critical information, coordinating their activities, and making well-informed decisions by using digital communication tools and centralized platforms (Lekan Damilola Ojo, 2019).

Effective systems for communication also take into account stakeholders like clients, engineers, architects, and subcontractors in addition to the immediate project team. Construction projects can guarantee that expectations are satisfied, possible problems are dealt with quickly, and necessary adjustments are made on schedule by keeping regular and transparent communication with stakeholders. By reducing errors, rework, and disruptions caused by misunderstandings or poor coordination, this inclusive approach not only promotes trust and satisfaction among all parties involved but also helps the project succeed overall (Elnaz, 2019).

2.6.1.2. Efficiency in Resource Utilization

In construction projects, effective structures for collaboration and communication have a substantial impact on how well resources are used. These systems facilitate the best possible resource allocation, cutting down on waste and increasing productivity by guaranteeing that all parties involved are informed and on the same page. For example, real-time updates on project progress can be facilitated by a centralized communication platform, which enables timely resource allocation adjustments in response to challenges or changes. This proactive strategy reduces the possibility of resource overuse or underuse, which boosts project efficiency and results in significant cost savings (Rahman et al., 2014).

According to (Gamage, 2022), effective communication systems for collaboration and communication also promote a culture of shared accountability and teamwork, which encourages experts from different fields to pool their knowledge. By identifying and resolving possible problems early on, this collaborative approach lowers the possibility of

expensive rework and guarantees resource efficiency. Digital communication tools and project management software can also automate repetitive tasks, optimize resource allocation, and streamline processes. These tools offer valuable insights into resource utilization and facilitate data-driven decision-making.

The capacity of efficient communication systems to promote innovation and ongoing development further enhances their influence on the effectiveness of resource utilization. These systems facilitate the exploration of alternative construction methods, materials, and technologies by promoting feedback and idea exchange, which can lead to improved project outcomes and decreased resource consumption. Moreover, improved coordination between various trades can be facilitated by the use of digital design, which lowers the possibility of errors and guarantees resource efficiency. All things considered, efficient resource utilization requires efficient communication and collaboration systems to ensure that construction projects are finished on schedule, within budget, and to the necessary quality standards (Safapour, Kermanshachi, & Kamali Rad, 2020b).

2.6.1.3. Timely Decision Making

According to (Chimay J. Anumba, 2007) a construction project's ability to make timely decisions is greatly impacted by its ability to establish clear and open communication channels, which guarantee that stakeholders are aware of issues and can act quickly to resolve them. Project teams can also make informed decisions more quickly by discussing problems, exchanging information, and working together to find solutions when they can readily share information, avoiding delays and maintaining project momentum. Lastly, the use of digital communication tools, such as instant messaging platforms and project management software, allows team members to share information in real time, even when they are geographically separated, which facilitates quick decision-making.

Systems of communication that work well increase the transparency of project issues and progress, giving stakeholders a thorough grasp of the project's state and possible difficulties. This openness is essential for prompt decision-making because it enables prompt issue identification, alternative evaluation, and solution implementation without needless delays. These systems make sure that everyone in the team is aware of the project decisions, meeting minutes, and action items. This results in clear and concise documentation that speeds up decision-making processes. Additionally, the use of technology, such as construction communication software, centralizes project data, lowering the possibility of

misunderstandings and guaranteeing that decision-makers have access to the most recent information, empowering them to act quickly and intelligently (Fakhro & Larm, 2019a).

In construction, efficient systems for collaboration and communication have a significant influence on timely decision-making. These systems offer the required tools and platforms for real-time information exchange and documentation, in addition to facilitating effective stakeholder communication and collaboration. Construction projects can achieve better project efficiency, fewer delays, and successful project outcomes by encouraging transparency, optimizing communication procedures, and utilizing technology (Suleiman, 2022).

2.6.2. Schedule Adherence

In construction projects, meeting deadlines is dependent upon effective communication and collaboration. Construction teams can increase overall project efficiency, reduce delays, and improve task coordination by putting in place a strong communication management system (Nur Mardhiyah Aziz, 2022).

2.6.2.1. Timely Information Flow

According to (Shehu, 2019), in construction projects, timely information flow is dependent upon effective communication. Construction teams can increase overall project efficiency, reduce delays, and improve task coordination by putting in place a strong communication management system.

Reducing misunderstandings that can cause delays requires messaging that is clear and succinct. All stakeholders are kept informed about project timelines through regular updates and progress reports, which enable any necessary adjustments to be made on time. Utilizing technology, such as collaboration platforms and construction management software, simplifies communication and makes real-time information sharing possible. Even in cases where team members are geographically separated, these tools facilitate effective collaboration, task tracking, and centralized document storage. The chance of misunderstandings is decreased and everyone has access to the most recent information by offering a centralized platform for communication and project information (Shehu, 2019).

2.6.2.2. Problem Resolution

According to (Gamage, 2022b) resolving issues is greatly impacted by efficient systems of collaboration and communication in the construction industry. Construction teams can

detect problems early and take action before they become more serious by promoting open and transparent communication.

Effective communication enables stakeholders in a project to quickly exchange information about new issues that arise, which helps the team come up with solutions as a whole. Real-time information sharing is made possible by the use of centralized communication platforms and collaboration tools, which speed up problem-solving. Team members are encouraged to share their special insights and areas of expertise through this collaborative approach, which produces more creative and all-encompassing solutions. Moreover, transparent audit trails produced by well-documented communication and decision-making procedures facilitate the resolution of disagreements and miscommunications that may occur throughout the building process (Gamage, 2022).

According to Ope-Tairu, (2016), poor communication, on the other hand, can cause delays in the discovery and handling of issues, which can ultimately lead to higher expenses and schedule overruns. It can be more difficult for a team to coordinate and synchronize their efforts when there is ineffective communication, which makes solving complex problems more difficult. Construction teams can prioritize problem-solving mindsets, strengthen team cohesion, and optimize project efficiency by emphasizing effective communication and collaboration.

2.6.3. Quality Impact

2.6.3.1. Feedback Mechanism

According to Ana Bovan, (2020), project feedback mechanisms are greatly impacted by efficient systems of communication in the construction industry. Giving prompt, clear feedback is crucial to raising performance levels and resolving problems as soon as they arise. Construction teams can enable stakeholders to provide insightful feedback, identify areas for improvement, and make well-informed decisions by facilitating a continuous feedback process through the establishment of efficient communication channels and the utilization of collaboration tools. Construction projects benefit from feedback mechanisms because they facilitate information exchange among team members and enable prompt course corrections and adjustments when necessary. Feedback also helps the team develop a culture of transparency and learning by fostering positive communication and a common understanding of the objectives and specifications of the project.

Moreover, feedback mechanisms that are bolstered by efficient communication and help projects succeed by encouraging the feedback process's validity, clarity, and preparedness. Effective feedback action is made possible by recipients who can easily understand it when there is clear communication between them. The responsiveness and adaptability of construction teams are improved when they receive and act upon valid and reliable feedback. The integration of feedback mechanisms within the communication and collaboration framework can enhance construction projects' efficiency, reduce errors, and promote an innovative and continuous improvement culture (Ana Bovan, 2020).

2.6.3.2. Knowledge Sharing

According to Nahyan *et al.*, (2019), the transfer of information between project teams is greatly impacted by efficient communication systems in the construction industry. These systems facilitate the transfer of valuable knowledge and expertise by creating an environment that promotes open dialogue and information exchange.

A common knowledge base can be accessed and added to by team members through centralized communication platforms and collaboration tools, which enable real-time knowledge sharing. Within the team, this knowledge exchange fosters innovation and ongoing learning in addition to improving decision-making. To address the complex challenges that arise during construction projects, a workforce that is more knowledgeable and flexible is produced when team members feel at ease sharing their experiences and knowledge (Nahyan *et al.*, 2019).

2.6.4. Stakeholder Satisfaction

2.6.4.1. Transparency and Trust

According to Hala Taleb, (2017), project teams that cooperative frequently develop a culture of trust and friendship. Developing solid relationships is crucial for success in the high-pressure world of construction, where complicated tasks and short deadlines are the norm. Team members can establish mutual respect, connections, and an understanding of each other's advantages and disadvantages during meetings. In the end, this companionship leads to increased productivity and project success by boosting morale, teamwork, and communication efficiency. In construction, frequent meetings and conversations are essential for efficient communication and teamwork, which promotes project success and a healthy work atmosphere.

2.6.4.2. Engagement and Involvement

Stakeholder involvement and engagement in construction projects are greatly impacted by efficient communication and collaboration systems. These systems can increase the general engagement and involvement of all parties involved by creating an atmosphere that promotes candid communication and active participation (Fakhro & Larm, 2019a).

Stakeholders feel more empowered to offer suggestions, voice concerns, and actively engage in the decision-making process when communication is clear, transparent, and accessible. This degree of involvement fosters a sense of commitment and ownership among the team members in addition to raising the caliber of the finished product. Moreover, efficient platforms for collaboration facilitate real-time cooperation, information exchange, and shared objectives among stakeholders, thereby augmenting their engagement and commitment to the project's triumph (Fakhro & Larm, 2019).

2.6.4.3. Expectation Management

According to Akintelu *et al.*, (2023), in the construction industry, managing stakeholder expectations is greatly impacted by efficient communication and collaboration systems. Construction teams can successfully match stakeholder expectations with project goals and objectives by creating clear communication channels and encouraging a collaborative environment.

It is ensured that the needs and concerns of stakeholders—clients, architects, and subcontractors—are promptly attended to through regular communication. By regularly providing information on project status, possible obstacles, and suggested solutions, this openness aids in controlling expectations. In addition, cooperative decision-making involving important stakeholders guarantees that project outcomes meet or surpass stakeholders' expectations and helps to align expectations. A high degree of trust, satisfaction, and successful project delivery can be maintained in construction projects by effectively managing stakeholder expectations through communication and collaboration (Akintelu *et al.*, 2023).

2.7. Challenges Faced in Communication management sytem

According to Taleb *et al.*, (2017), there are four types of challenges faced in communication verbal, environmental, interpersonal, and emotional reactions were identified as common

sources of interference within projects. As a result, this classification is the basis upon which communication barriers are presented in the literature, and multiple studies support this assertion.

Table 2-3: Barriers to communication (Taleb *et al.*, 2017)

Verbal	Environmental	Interpersonal	Emotional reaction
-Speaking fast -speaking with slag -no proper attention was given	Noise Diverse interruption	-language deference -defective assumption	-anger -embarrassment
-late replays -the absence of language skill		Lack of interpersonal relationship	Little mutual trust
	-Cultural environment Education	Sender-receiver relationship	Individual experience
-No evaluation before the response -Communication tone	Cultural bias		
	Inappropriate communication venue.	-knowledge difference	Lack of trust

According to (Azhar & Abeln, 2014), one of the biggest obstacles to applying effective communication and collaboration in the construction industry is the lack of adequate instruction and training on collaborative management instruments and methods. This is due to the possibility that many professionals in the construction industry, such as engineers, contractors, and project managers, lack the abilities or knowledge required to use communication management tools and techniques effectively. Inadequate training could make it difficult for them to use these tools, which could result in misunderstandings,

mistakes, and ineffective communication. A project manager's inability to efficiently create and assign tasks, monitor progress, or share documents, for example, can impede team member communication if they are unfamiliar with project management software.

Furthermore, poor communication practices can result from a lack of knowledge about communication management strategies. For instance, professionals in the construction industry might lack the skills necessary to effectively communicate, listen, or resolve conflicts. Delays, miscommunication, and cost overruns may arise from this. Moreover, the construction sector is growing more and more dependent on technology, and this dependence can be made worse by a lack of training in digital communication tools. To guarantee that construction professionals can communicate and work together effectively, it is crucial to give them the necessary training and education on communication management tools and techniques. Workshops, online classes, and on-the-job training can help close the knowledge gap and enhance communication techniques to accomplish this (Suleiman *et al.*, 2023).

Effective communication can be significantly impacted by the integration of disparate means of communication and methods. One of the primary problems is that different systems are incompatible with one another, which can cause information sharing to become ineffective and fragmented (Kurt Swart, 2022). The instruction slope that comes with using several platforms is another difficulty. Every tool has a distinct set of features, a user interface, and recommended practices. Workers may find it difficult to adjust to these changes, which could cause them to become confused, frustrated, and less productive. Using different platforms can also lead to communication barriers, where some staff members are privy to particular data or discussions while others are kept in the dark. This may impede teamwork, decision-making, and the advancement of the project as a whole (Kurt Swart, 2022).

Executing successful communication can be significantly complicated by stakeholders' resistance to change. Many companies may be unwilling to adopt new technologies or communication methods because they are comfortable with the ways they work now. This resistance may be caused by several things, including a conviction that what is currently available is adequate, a fear of the unknown, or a lack of awareness of the advantages of change (Butt *et al.*, 2016).

According to (Heravi et al., 2015) Change resistant stakeholders may put obstacles in the way of the execution process. They might not want to change the way they communicate,

take part in training sessions, or offer input on new systems. This resistance may result in a lack of support and buy-in from important decision-makers, which will make it challenging to move the change forward. A breakdown in cooperation and communication may also result from ineffectively handling the resistance, since some stakeholders may continue to employ antiquated techniques while others attempt to apply the new ones.

A major obstacle to efficient communication and teamwork can be the insufficient funding of communication system implementation and maintenance. Several problems can arise when companies don't allocate enough resources—time, cash, and staff—to creating and maintaining communication platforms (Gamage, 2022). For instance, system failures, sluggish performance, and restricted functionality may arise from the absence of the required hardware, software, and infrastructure. Users may become frustrated and lose faith in the communication tools as a result, making them reluctant to use them.

On top of that, Gamage (2022) added that communication systems risk becoming antiquated, unsafe, or incompatible with emerging technologies if sufficient funding isn't available for continuous maintenance and support. Compatibility problems, data loss, and security risks may result from this. Insufficient resources for user support and training may also make it difficult for staff members to use the communication tools efficiently, which will reduce output and teamwork. To surmount this obstacle, institutions need to give priority to communication systems as a vital financial outlay and assign enough funds to guarantee their effective execution and enduring viability.

Language and cultural differences among those cooperating can make it very difficult for them to communicate effectively. Cultural differences can lead to different methods of communication, standards, and expectations among team members. Certain cultures place a higher importance on direct communication, whereas others might favor a more covert strategy. If these differences are not appropriately addressed, they may result in confusion, misconceptions, and even conflicts (Jinfang Yao, 2023).

According to (Suleiman, 2022), effective communication can also be restricted by barriers to language, particularly in multinational teams. Lack of a common language among team members can make it challenging to communicate complicated concepts, seek clarification, or have fruitful conversations. Ernest Kissi, (2019), this may result in a lack of mutual comprehension among team members, shortages of knowledge, and delays when making choices. Companies need to make investments in language training, offer translation

services, and promote awareness and compassion for other cultures among team members in order to overcome these obstacles. To guarantee each person is in agreement and able to contribute to the project, they should also set open communication protocols and instructions.

According to Elena Tsakakis, (2023), in isolated or developing regions, where infrastructure may be inadequate or antiquated, this problem is especially common. Attending video conferences, sharing large files, or using online collaboration applications may be difficult for team members who are located in these areas. A sense of isolation from the other members of the team as well as delays and extensions of time may result from this. Companies have to put money into solutions that guarantee equitable access to communication technologies to overcome this challenge. Proactively assess the communication needs and capabilities of all project locations.

2.8 Research Gap

To get sufficient knowledge about important concepts to conduct this thesis many literatures are reviewed. Most of the literature reviewed on effective communication management systems in the construction industry are from other developed countries (Namhun Lee, 2018), (Akinradewo et al., 2019), (Gamage, 2022) and others. It is known that some local researchers; (Gebru, 2021) and (Mengistu & Mahesh, 2020) have conducted their research on the practical implementation of modern communication management system tools and techniques for effective communication sytem in the Ethiopian context. There is a lack of empirical data on how these tools can be integrated into existing systems to overcome traditional communication barriers. Additionally, the impact of effective communication and collaboration on project outcomes such as cost, time, and quality in Ethiopia's construction projects remains under research the So This study aims to bridge these gaps by providing a comprehensive analysis of the key determinants of effective communication management system in Ethiopia's construction industry, assessing their impacts, and identifying the challenges to their implementation. By focusing specifically on Grade One contractors in Addis Ababa, this research provides targeted insights that can help improve the overall efficiency and performance of construction projects in Ethiopia.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes all the methodologies that were undertaken to achieve the objective set for this study. The procedures that were adapted including all the information relevant to the collection of data, here and how those data were obtained are discussed. In addition, data and information sources, research instruments, sample size, and method of analysis are presented. The succeeding sub-section provides a general description of the research strategy adopted. This thesis, as well as justification of the methodology.

3.2. Research Design

Research designs are methods and procedures for conducting research that range from general hypotheses to specific techniques for gathering and analyzing data (Creswell, 2017).

The study began with the collection of secondary data through a thorough review of the literature from a variety of sources, including websites, journals, and reference books. A questionnaire survey was used as the second phase of data collection after the literature review. A survey that addressed the respondent's profile, the essential elements of an efficient communication and collaboration system, their influence in the construction sector, and the difficulties they faced in putting these essential elements into practice.

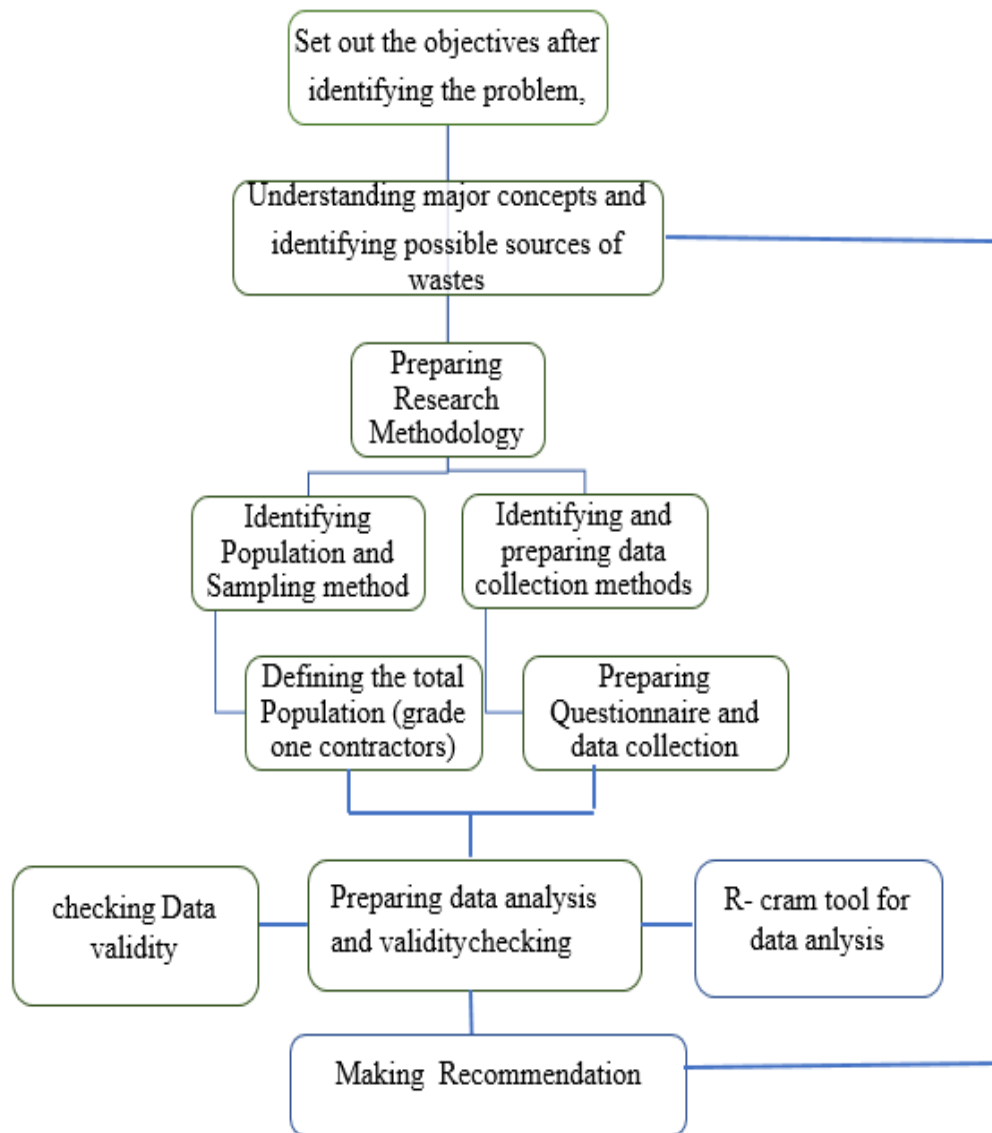


Fig 3.1 Research Design

3.3. Research Approach and Data Source

Research Approach

For this research quantitative research approach was used to collect quantitative information on the key determinants of effective communication management in the preferences of GC1 contractors, structured surveys were distributed to a representative sample of companies. The descriptive research design was suited for studies that focus on specific predictions, factual narratives about people or situations, or descriptions of events or phenomena as they currently occur (Kothari, 2004).

Data source

In this study, primary and secondary data sources were both used. Through a thorough review of the literature from a variety of sources, including websites, journals, and reference books, secondary data was gathered. Direct observation, interviews, and questionnaire surveys are used to gather data from the primary data source.

3.4. Population and Sampling Technique

3.4.1. Population

The research population consists of grade-one constructors who are actively working on construction projects in Ethiopia's capital, Addis Ababa. In the construction industry, they are companies which had valid registration according to the Ministry of Ethiopian Construction Authority.

The top level of construction contractors are represented by grade one contractors, who are usually distinguished by their vast experience, sound financial standing, and ability to manage major projects. Large commercial buildings, bridges, and other important infrastructure projects frequently involve these contractors. They typically possess advanced technical knowledge, a sizable portfolio of finished projects, and the capacity to rapidly mobilize significant resources. To ensure that grade one contractors follow strict industry standards and are capable of handling complicated, expensive construction projects with a high level of dependability and professionalism, this classification frequently necessitates rigorous certification procedures.

These grade one contractors work in various construction projects within various compounds located all over Addis Ababa. These compounds act as centers for building activity, offering the room and resources needed for projects to advance. These builders apply their knowledge and abilities to projects of different sizes and complexity, from high-rise structures to complex developments in cities, fostering innovation and progress in the construction sector. Their contributions to the urban transformation and economic vitality of Addis Ababa as important stakeholders in the construction sector highlight the significance of comprehending their perspectives and experiences within the framework of collaborative and communication management systems. The study therefore targets the population of 93 contractors.

3.4.2. Sampling Technique

According to Kothari, (2004), the random systematic sampling method was used when the population members are similar on important variables and all the units are randomly arranged. So to guarantee a representative sample from a homogeneous population, the researcher selected systematic random sampling for the study. Thus, this method captures population uniformity, which is important for the reliability of the results, by choosing every k th element from a list after a random starting point. Its simplicity and affordability make this method a good fit for the limitations of the research.

It also avoids selection bias because every member of the population has an equal chance of being chosen through systematic random sampling. The study findings will be reliable and applicable to a wide range of situations because this strategy ensures that my sample fairly represents the total population.

3.4.3. Sample Size Determination

There are a total of 93 companies that are registered by the Ethiopian Construction Authority as grade one contractors which are located in Addis Ababa. Not all 93 companies were selected. From 93 of the population, 49 companies were selected

To calculate the population's sample size, the (Kish, 1965) equation, which is derived from this formula, was applied:

$$n = \frac{n'}{[1 + \frac{n'}{N}]} \dots\dots\dots \text{equation 3.1}$$

Where:-

n' is the sample size from a finite population, which can be calculated from this formula.

$[n' = \frac{s^2}{v^2}]$ The definitions of all variables can be defined as the following:

n : sample size from a finite population.

N : Total population

v^2 : Standard error of sample population equals 0.05 for the confidence level 95%,

s^2 : Standard error variance of population elements; maximum at

The sample size for the population can be calculated from the previous equations as follows:

$$n' = \frac{s^2}{v^2} = \frac{0.5^2}{0.05^2} = 100$$

$$n = \frac{n'}{[1 + \frac{n'}{N}]} = n = \frac{100}{[1 + \frac{100}{93}]} = 49 \text{ Companies}$$

The following procedures were followed to carry out the systematic random sampling:

Population Size N: It was calculated that the total population size was 93

Sample Size n: a sample size of 49.

Sampling Interval Calculation: The population size was divided by the intended sample size to arrive at the sampling interval (k).

$$k = N/n = 93/49 = 1.89$$

The sampling interval was rounded up to the closest whole number because it should have been a whole number and that closest whole number is 2.

We decide at random to begin with the first company. We carried on choosing every second item until we had chosen 49 companies in total, which would make up our sample.

3.5. Methods of Data Collection

In this study, a questionnaire was used as a data collection method. It implies that only one method was used to obtain the data.

3.5.1. Collection of Data through Questionnaire

The selected method for gathering data was Questioner Express. Based on the information acquired from literature reviews questionnaires are developed for survey exercise to investigate the impact of these key determinant factors. Due to their appropriateness for acquiring the level of information in a larger number, questionnaires were selected as a major research instrument.

The structured questionnaire was accompanied by a cover letter and consisted of four sections.

3.5.1.1. Questioner Survey Section A

This section provides information about the participants' backgrounds, including their gender, current job title, prior construction industry work experience, educational background, and the organization they are employed by.

3.5.1.2. Questioner Survey Section B

The primary objective of the research was to identify the key determinants of an effective communication management system that have been identified by other researchers and are covered in the literature review. This data was useful in developing the question structure in section B.

3.5.1.3. Questioner Survey Section C

The second objective of the research was to identify the impact of the key determinant factors of effective communication systems in the construction industry. These have been identified by other researchers and are covered in the literature review. This data was useful in developing the question structure in section C.

3.5.1.4. Questioner Survey Section D

The third objective of the research was to identify the challenges of implementation of the key determinants of an effective communication system in the construction industry that have been identified by other researchers and are covered in the literature review. This data was useful in developing the question structure in section D.

3.6. Description of Variables

This study "An Evaluation of the Success Factor Influencing Communication Management Systems in Ethiopia's Construction Industry from Contractors Perspective" can be divided into independent and dependent variables. The use of technology, stakeholder involvement, regular meetings, training and skill development, project leadership, defined roles, and resource availability are examples of independent variables that reflect important determinants. These variables affect how well teamwork and communication take place during building projects.

The successful communication within the construction industry is reflected in the dependent variables of this study. The aforementioned factors encompass project success metrics, communication efficiency, collaboration quality, innovative problem-solving skills, employee satisfaction, and retention. Communication quality assesses stakeholder satisfaction, teamwork, and conflict resolution; communication efficiency measures the speed, clarity, and accuracy of information exchange. Job satisfaction with communication practices and overall employee turnover rates are measured by employee satisfaction and retention, while innovation and problem-solving capabilities examine the capacity to

generate original solutions and enhance project workflows. The study intends to determine crucial elements that either support or obstruct efficient communication and teamwork, which will ultimately result in more prosperous building projects in Ethiopia, by looking at these variables.

3.7. Data Analysis

The data collected using questionnaire data was analyzed using the R-cram software tool. descriptive statistics were applied to the analysis of data that helps to explain, show, or summarize numerical information in meaning full pattern for measures to be taken for key determinants of effective communication management system mean was used and analyzed using the R–cram tool. Tables and graphs were used to display the mean scores.

Before using the R-cram tool, the data was collected through structured questionnaires distributed to Grade One contractors in Addis Ababa. The questionnaire responses were then compiled into a dataset for analysis. The collected survey data was entered into an Excel sheet, a statistical software environment. Each response was coded and organized to facilitate analysis. This included categorizing responses based on the key determinants of effective communication and collaboration, their impacts, and the challenges faced.

Using the R-cram tool, the following steps were undertaken for data analysis:

Descriptive Statistics: The tool was used to calculate descriptive statistics such as mean, median, and standard deviation for the key determinants identified in the survey. This helped in understanding the central tendencies and dispersions of the responses.

Reliability Analysis: To ensure the reliability of the survey instrument, Cronbach’s alpha was calculated using the R-cram tool. A value above 0.7 was considered acceptable, indicating good internal consistency among the survey items.

Mean Score Analysis: The mean scores for each key determinant were computed to identify their relative importance as perceived by the respondents.

Graphical Representation: R-cram was used to create visual representations of the data, such as bar charts and histograms, to illustrate the distribution and frequency of responses.

Then the results from the R-cram analysis were interpreted to draw meaningful conclusions about the key determinants of effective communication in the construction industry. The mean values and standard deviations provided insights into which factors were considered most critical by the respondents.

3.8. Research Validity and Reliability

To ensure the solid dependability of the tools, the researchers were dedicated to creating products with the highest clarity, providing instructions that are crystal clear, and making sure that the administration process is equitable and accurate. Beyond the fundamentals, we put our questionnaires to the test by analyzing data from a pilot sample and examining them using Cronbach's alpha to reveal their actual reliability (Bonett & Wright, 2014) Bonett & Wright (2014), state that Cronbach's Alpha value above 0.70 is considered acceptable for basic research. A value above 0.80 indicates good reliability, and a value above 0.9 is considered excellent..

3.9. Ethical Consideration

The researcher obtains the participants' informed consent before setting out on this thrilling exploration journey, making sure they are fully aware of the adventure that lies ahead. As part of our openness, we give a clear summary of the purpose of the study and reassure participants that they are free to withdraw from the study at any time. To protect the identity of our esteemed contributors, we appropriately hide personal identifiers from them and provide explicit guidance on how to strengthen this barrier of privacy. They can be sure that the valuable data obtained from this procedure only be used for the admirable purpose of research, and that the confidentiality of the information is always respected.

CHAPTER FOUR

RESULT AND DISCUSSION

4.1. Introduction

This research chapter presents the information obtained from the questionnaire survey and This research chapter presents, interprets, analyzes, and discusses in detail the data gathered from the questionnaire survey to support the essential components of an efficient communication and collaboration system, their implications for the construction sector, and the difficulties encountered in putting them into practice, all from the viewpoints of experts.

4.2. Reliability Test

The reliability analysis, as evidenced by Cronbach's alpha value of 0.811, indicates that the measurement has good reliability.

4.3. Discussion of the Result

The analysis and discussion of the information obtained from the questionnaire survey are covered in this section.

4.3.1. General Background Information

The first section of the questionnaire contains the participants' demographic information. Gender, sex, education level, work experience, occupation, and the organization that the respondents represent are some of these components.

4.3.1.1. Gender of the Respondents

Table 4.2 shows that 59.18% of the respondents, according to the data, are men. This suggests that there is a greater proportion of men in the sample, which may be a reflection of the demographic trends in the business or organization being polled. The cumulative value for men is 59.18%, which indicates that men make up 59.18% of the total responses after taking into account male respondents.

Of the entire sample, 40.82% of respondents are female. Even though it is less than the representation of men, this still makes up a sizable portion of the respondents. When female respondents are included, the cumulative value reaches 100%, signifying that the gender distribution is complete.

Table 4-1: Gender of the respondents

Category	Count	Percentage	Cumulative
Gender - Male	29	59.18%	59.18%
Gender - Female	20	40.82%	100.00%

4.3.1.2. Respondents Age

Table 4.3 shows the age of the respondents from the table the youngest age group of respondents, making up only 8.16% of the sample as a whole, is that of respondents under 25. This shows that there is a lower representation of younger people in the dataset, which may be due to lower entry-level participation or a lack of experience in the field.

40.82% of the respondents are between the ages of 25 and 30. This is a sizable portion of the population. Most members of this group are probably in the early to mid-career stages and are actively expanding their professional experience and knowledge.

Over-30-year-olds make up the largest age group among respondents (51.02%). This implies that a sizable portion of the survey's participants were more seasoned and possibly even senior.

Table 4-2: Age of the respondents

Category	Count	Percentage	Cumulative
Age - <25 years	4	8.16%	8.16%
Age - 25-30 years	20	40.82%	48.98%
Age - >30 years	25	51.02%	100.00%

4.3.1.3 Respondents Education Qualification

The respondents' educational backgrounds are displayed in Table 4.2. A master's degree is held by more than half of the respondents (51.02%). The survey respondents' high educational attainment level suggests that they probably possess advanced knowledge and skills in their respective fields. And 48.98% of respondents, or nearly equal, hold a bachelor's degree. This shows that a sizable portion of the population also has a foundational higher education degree.

The respondents are highly educated, as evidenced by the education qualification table, where a sizable portion have bachelor's degrees and the majority have master's degrees. Given their high educational attainment, it is likely that the survey respondents have advanced knowledge and skills, which will enable them to provide insightful responses. Comprehending the educational background of the participants can assist organizations in creating focused programs for training and development, allocating suitable roles, and promoting ongoing professional advancement.

Table 4-3: Education qualification of the respondents.

Category	Count	Percentage	Cumulative
Education - Master's Degree	25	51.02%	51.02%
Education - Bachelor's Degree	24	48.98%	100.00%

4.3.1.4. Respondent's Year of Experience

Table 4.4 shows the respondent's years of experience. More than 25% of the participants (26.53%) have experience of less than ten years. This category comprises professionals in the early stages of their careers who are still developing their skills and acquiring real-world experience. With between 10 and 20 years of experience, the majority of respondents (61.22%) fit this description. This group includes professionals in their mid-career who have gained significant experience and most likely assumed more senior and complex roles within their organizations. The percentage of respondents with more than 25 years of experience is lower (12.24%). These people are probably extremely seasoned professionals with a wealth of expertise, perhaps in leadership or specialized expert roles. They will add a great deal of knowledge and experience to the survey.

Table 4-4: Years of work experience of the respondents

Category	Count	Percentage	Cumulative
Experience - <10 years	13	26.53%	26.53%
Experience - 10-20 years	30	61.22%	87.76%
Experience - >25 years	6	12.24%	100.00%

4.3.2. Results of the Key Determinants of Effective Communication Management System

Table 4-5: Key determinants of effective communication management system

Key Determinant	Mean	Standard Deviation
Clearly defined roles and responsibilities	3.47	0.62
Regular meetings and discussions among project teams	3.33	0.75
Project Leadership and Management system	3.27	0.7
Regular Feedback	3.24	0.75
Transparency and Openness among stakeholders	3.24	0.66
Flexibility and Adaptability of communication tools	3.22	0.77
Trust and mutual respect among team members	3.14	0.84
Accessibility of Communication management tools	2.94	0.77
The use of standardized communication protocols and procedures	2.92	0.89
The availability of modern communication tools	2.94	0.77
Effective communication channels between project managers, contractors, and subcontractors	2.90	0.85

Adequate training in communication system practices	2.88	0.9
Continual Monitoring and Evaluation of the communication system	2.88	0.83
Involvement of All Stakeholders	2.84	0.94
Adequate Allocation of Resources	2.67	0.83

The first objective of this study is to identify the key determinants of effective communication management systems. The frequency, percentage, mean, and standard deviation of responses for several important factors that determine effective communication and collaboration systems in the construction sector are summarized in the table. This thorough analysis assists in determining which determinants are most strongly ranked and which ones are ranked less.

For the availability of modern communication tools, the respondents who agree are 58%, and 20% strongly agree. This means that almost all respondents agree on the availability of modern communication as a key determinant of effective communication and collaboration systems.

For the regular meetings and discussions among stakeholders, the respondents who agree are 46%, and 44% strongly agree. This means regular meetings among stakeholders are highly valued, with nearly equal responses between agree and strongly agree, suggesting strong consensus on its importance.

For clearly defined roles and responsibilities with stakeholders the respondents who agree 46%, and 50% strongly agree. This means clearly defining roles and responsibilities among stakeholders is critical, with the highest mean score and low standard deviation, reflecting strong and consistent agreement.

For effective communication channels between stakeholders, the respondents agree are 46%, 24%strongly agree, and 22% neutral. While many agree on the importance of effective communication channels as a key determinant of effective communication and collaboration systems, the higher neutral responses indicate some ambiguity or areas needing improvement.

For adequate training on communication and collaboration practice the respondents who agree are 54%, 22% strongly agree, and 12% disagree. This key determinant factor is generally supported, but the higher standard deviation and disagreement percentage suggest variation in perceptions.

For trust and mutual respect among stakeholders, the respondents who agree are 46%, and 36% strongly agree. That means it is highly valued, with a relatively high mean and consistent agreement.

For the use of standardized communication protocols and procedures, the respondents who agree are 52%, and 24% strongly agree. While generally agreed upon, the higher standard deviation indicates variability in how respondents perceive the use of standardized communication protocols and procedures.

For adequate allocation of resources the respondents who agree are 52%, 12% strongly agree, and 24% neutral. This means there is some agreement on the adequacy of resource allocation, but the high neutral percentages have room for improvement.

For the regular feedback mechanism the respondents who agree are 50%, 38% strongly agree. This means this key determinant factor is highly supported, with a high mean score and consistent agreement.

For the involvement of all relevant stakeholders in the communication and collaboration system, the respondents who agree are 46%, 24% strongly agree, 16% are neutral, and 12% disagree. While generally agreed upon, the higher standard deviation and significant disagreement indicate varying perceptions of stakeholder involvement.

For transparency and openness among stakeholders, the respondents who agree are 56%, and 34% strongly agree. This means transparency and openness among stakeholders are highly valued, with strong and consistent agreement.

For flexibility and adaptability of communication tools the respondents who agree are 54%, 36% strongly agree. This means it is ranked as an important key determinant of an effective communication and collaboration system.

For project leadership and management the respondents who agree are 50%, 38% strongly agree. This means effective leadership and management are highly valued, with strong and consistent agreement.

For continual monitoring and evaluation of the communication and collaboration system, the respondents who agree are 48%, 22% strongly agree, and 22% neutral. While generally supported, the higher neutral percentage suggests some ambiguity or areas needing improvement.

For accessibility of communication tools, the respondents who agree are 58%, and 20% strongly agree. This means accessibility of communication is important, with a high mean score and consistent agreement.

According to respondents, clearly defined roles and regular meetings are the most important factors for efficient communication and teamwork in the construction sector. The low variability in this statement suggests that respondents strongly agree. While communication channels and tool availability are equally vital, they also reveal a wider range of viewpoints, which may indicate certain shortcomings. With the lowest mean and highest variability, adequate training is clearly in need of improvement.

Generally, these results show that, with mean values of 3.47 and 3.33, respectively, clearly defined roles and regular meetings are considered the most important factors for successful communication and collaboration in the construction industry. Though vital, the availability of tools and channels for communication has somewhat lower mean values, indicating that other factors like appropriate use and user competency determine how effective they are. With the lowest mean value of 2.88 for adequate training, there is room for improvement. To maximize communication and collaboration systems, the industry can gain from improved training initiatives as well as a persistent focus on frequent gatherings and precise role definitions.

4.3.3. Results on the Impact of Key Determinants in Effective Communication Managemnt System

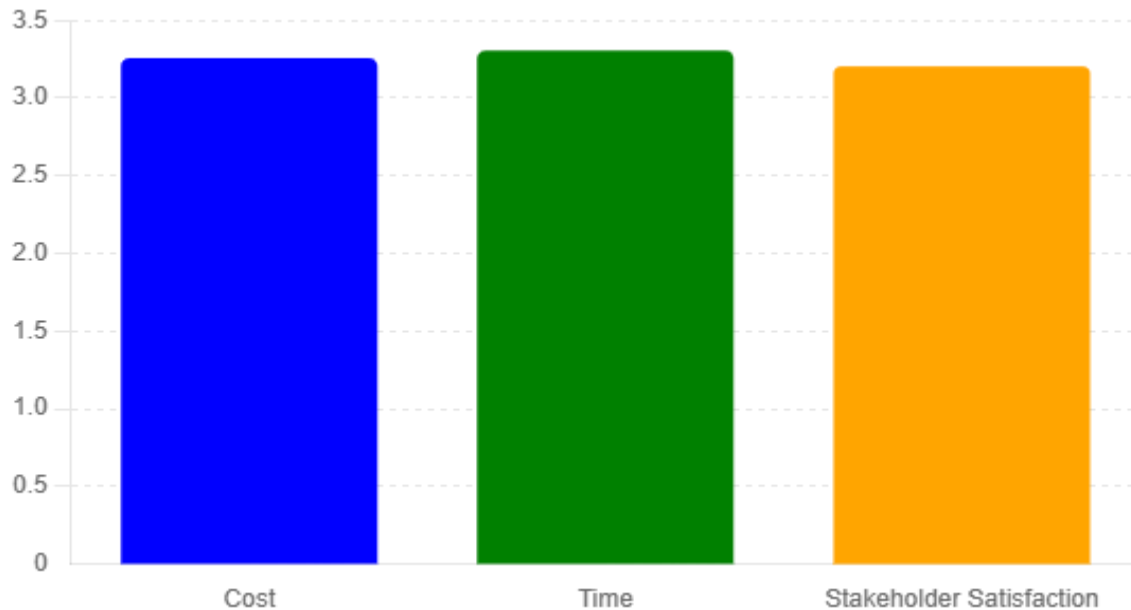


Figure 4- 1: Impact of effective communication management system on cost, time, and stakeholder satisfaction.

In Fig 4.2 the three key construction project management dimensions cost, time and stakeholder satisfaction are represented by the bar chart, which shows the average impact scores of good communication. A bar is used to symbolize each dimension, and the average impact score, which ranges from 0 to 5, is displayed on the y-axis.

The bar graph highlights the impact of effective communication on cost, schedule, and stakeholder satisfaction, providing important insights into the role of communication in construction project management. Time management receives the highest average impact score of 3.31, highlighting the importance of effective communication in maintaining project timelines and preventing expensive delays. This emphasizes how crucial it is to lessen misunderstandings, foster teamwork, and guarantee consistent task execution.

The impact on cost management, with an average score of 3.26, comes in a close second. Improved accuracy, fewer mistakes, and the promotion of best practices are all benefits of effective communication that lead to cost effectiveness. Contractors understand that maintaining effective lines of communication can help them stay within budget and avoid cost overruns.

Stakeholder satisfaction exhibits a noteworthy influence as well, with an average score of 3.20. Effective communication is essential for modernizing worker knowledge, improving team interactions, creating a positive work environment, and satisfying stakeholders. Building trust and managing expectations are two key components of transparent, clear, and consistent communication that lead to high stakeholder satisfaction.

The bar chart clearly shows that effective communication techniques are essential to the successful completion of construction projects successfully. Project outcomes can be greatly improved by prioritizing communication strategies, making training investments, and utilizing contemporary communication tools. These actions will also ensure stakeholder satisfaction, cut costs, and improve timeliness. To reap these advantages, project managers ought to give careful consideration to cultivating efficient communication within their teams.

Cost

A mean value of 3.26 indicates that communication has a strong impact on cost management, suggesting that most contractors believe that good communication helps in reducing errors, improving accuracy, and ensuring consistent project execution, which in turn can lead to cost savings.

Time

The highest average score among the three dimensions is 3.31, which underscores the critical role of communication in managing project timelines. Effective communication reduces misunderstandings, promotes teamwork, and ensures consistency, which is vital for keeping projects on schedule and avoiding delays.

Stakeholder satisfaction

An average score of 3.20 reflects the significant impact of communication on stakeholder satisfaction. Enhanced team interactions, a positive work environment, updated knowledge, and meeting stakeholders' expectations contribute to higher satisfaction levels, emphasizing the importance of clear and effective communication.

Impact on cost

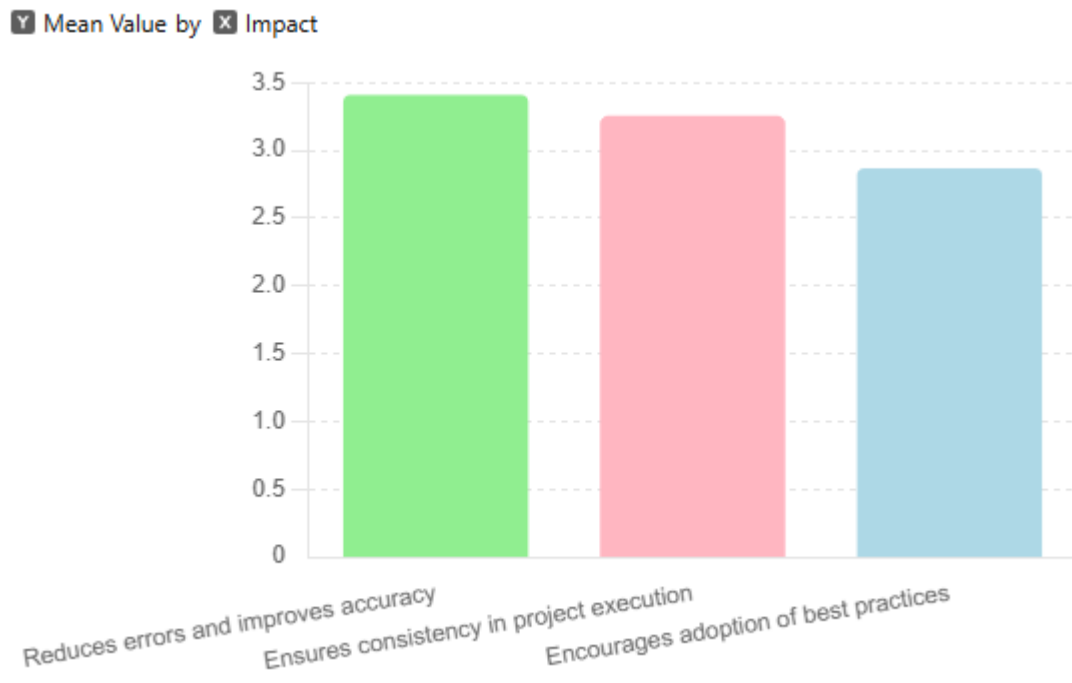


Figure 4-2: Impact on cost

- In fig 4.3 the chart shows that reduced errors and improved accuracy are identified as the most impactful determinants in terms of cost. This is because minimizing errors directly reduces waste and rework.
- Ensures consistency in project execution follows closely, underscoring the importance of standardization and reliability in project processes to avoid unexpected costs and delays.
- Encourage adoption of best practices is also essential, but slightly less impactful compared to the other two. This suggests that while best practices are impactful, their direct cost impact may not be as immediately evident as reducing errors or ensuring consistency.

Impact on Time

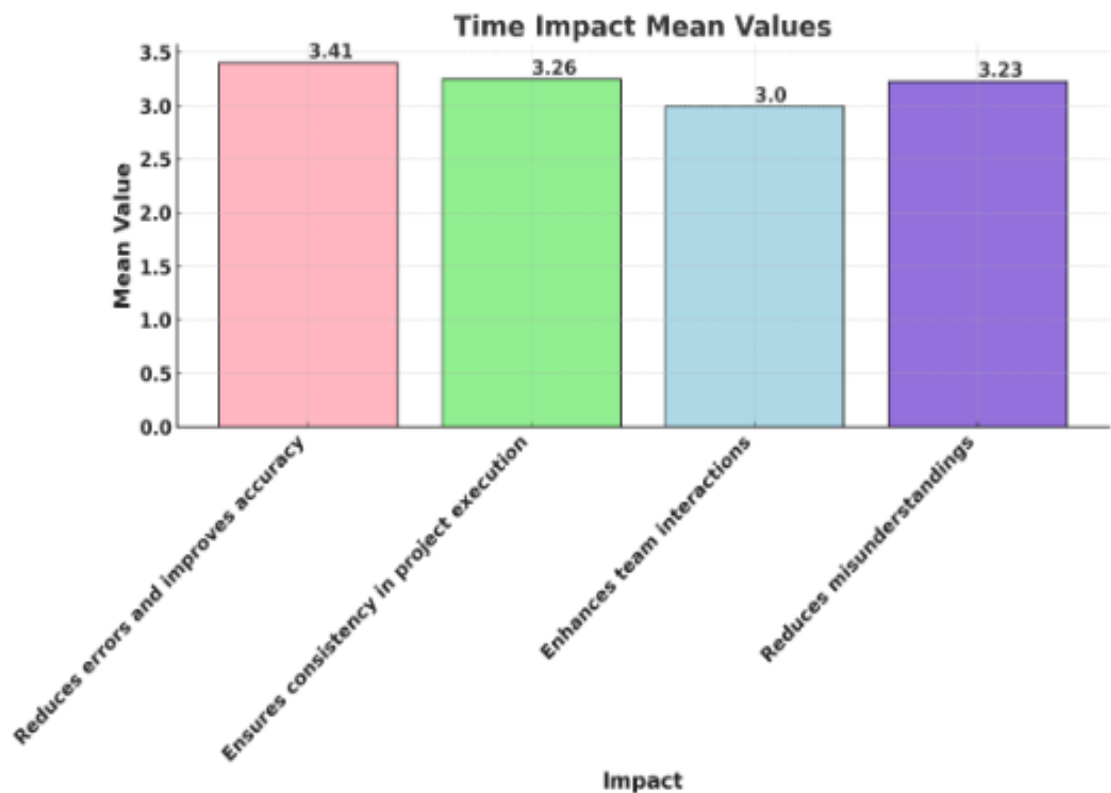


Figure 4-3: Impact on time

In Fig 4.4 the bar chart presents the average values of time-related impacts concerning four key factors in the construction industry: reducing errors and enhancing accuracy, ensuring project execution consistency, improving team interactions, and reducing misunderstandings. Among these factors, reducing errors and improving accuracy emerges as the most significant, with an average value of approximately 3.41. This underscores its critical role in minimizing delays and ensuring project timelines are met. Similarly, ensuring consistency in project execution, with an average value of around 3.26, also demonstrates a substantial positive impact, emphasizing the importance of standardized procedures and practices in avoiding schedule disruptions.

Emphasizing the importance of effective communication and collaboration in managing project schedules, the mean values of 3.00 and 3.23 highlight the role of enhancing team interactions and reducing misunderstandings. These determinants significantly contribute to time efficiency by promoting coordination among team members and reducing time-consuming conflicts and miscommunications.

Impact on Stakeholder Satisfaction

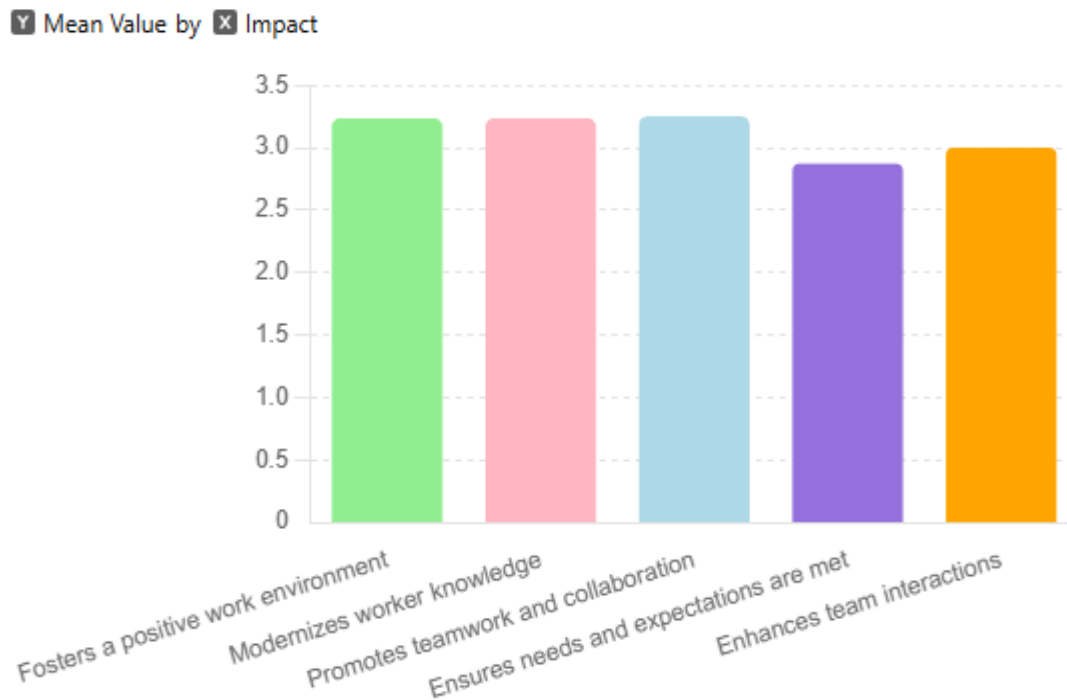


Figure 4-4: Impact on stakeholder satisfaction

In the fig 4.5 the bar chart illustrates the mean values of impact on stakeholder satisfaction: fostering a positive work environment, modernizing workers' knowledge, promoting teamwork and collaboration, ensuring needs and expectations are met, and enhancing team interaction. Among these, promoting teamwork and collaboration stands out with the highest mean value of 3.25, fostering a positive work environment and modernizing worker knowledge both have mean values of 3.23, enhancing team interaction with a mean value of 3.00 and ensuring needs and expectations are met has a mean value of 2.87,

The chart emphasized that promoting teamwork and collaboration is the most impactful determinant for stakeholder satisfaction, followed closely by fostering a positive work environment and modernizing worker knowledge.

It has been shown in the results that there is agreement among contractors regarding the critical role of communication when it comes to the effects it has on cost, schedule, and stakeholder satisfaction in construction projects. It is believed that implementing best practices, maintaining consistency, and lowering errors all contribute to increased cost-effectiveness. By reducing miscommunication and encouraging teamwork, it also plays a critical role in managing project timelines, with the greatest impact seen in this domain.

Furthermore, through encouraging positive interactions and living up to expectations, communication greatly increases stakeholder satisfaction. All things considered, effective communication techniques are critical to the timely completion, improved cost control, and stakeholder engagement of projects.

4.3.4. Result to Challenges in Implementing Effective Communication System

Challenges	Mean	Standard Deviation
Resistance to change among project stakeholders	4.08	0.78
Inadequate allocation of resources	4.00	0.81
Limited access to advanced technologies	3.96	0.94
Cultural and language barriers	3.88	0.8
Poor infrastructure for communication tools	3.77	0.99
Difficulty in integrating communication	3.69	0.71
Lack of standardized communication	3.69	0.95
Difficulty in ensuring consistent communication	3.67	0.87
Lack of adequate training	3.65	0.82
Complexity of project requirements	3.55	0.88

Table 4-6: challenges of effective communication management system

The table 4.6 shows that Resistance to change is identified as the most significant challenge. The high mean value of 4.08 indicates that this issue is widely perceived as a major barrier to effective communication and collaboration. The relatively low standard deviation suggests that most respondents consistently see resistance to change as a significant problem. To address this, it is crucial to engage stakeholders early, clearly communicate the benefits of changes, and provide ongoing support to ease transitions. The mean value of 4.0 shows that many respondents view inadequate allocation as a significant challenge. This consistent perception, as indicated by the low standard deviation, underscores the need for better planning and distribution of resources. Ensuring that teams have the necessary tools and support can greatly enhance communication and efficiency.

The mean value of 3.96 suggests that this is a considerable challenge for many respondents. The variability in responses, indicated by the standard deviation, reflects differing levels of

access and familiarity with these technologies. Addressing this issue involves investing in technology and training to ensure all team members can leverage these tools effectively.

The mean value of 3.88 indicates that this is a recognized issue among respondents. The moderate standard deviation shows that while many face this challenge, its impact can vary. Promoting cultural awareness and providing language support can help mitigate these barriers and foster better collaboration. The mean value of 3.77 indicates that this is a notable concern, while the higher standard deviation suggests that the quality of infrastructure varies widely. Investing in reliable communication infrastructure is essential to support efficient project management and collaboration. The mean value of 3.69 reflects substantial agreement on this issue, and the low standard deviation indicates a uniform perception among respondents. Effective integration requires both technological solutions and a cultural shift within organizations to prioritize streamlined communication.

The mean value of 3.69 shows that this is a common concern, while the higher standard deviation suggests that the impact varies among different projects and teams. Developing and enforcing standard communication procedures can ensure consistency and clarity. The mean value of 3.67 highlights widespread difficulties in this area, and the moderate standard deviation indicates that the extent of the difficulty varies among teams. Implementing reliable communication protocols and tools can help maintain consistency and reduce misunderstandings. Inadequate training is a critical challenge, as reflected by its mean value 3.65. This suggests that many construction professionals feel underprepared to effectively communicate and collaborate. The consistent perception of this issue, indicated by the low standard deviation, highlights the need for comprehensive training programs that equip workers with the necessary communication skills.

The complexity of project requirements is the lowest mean value 3.55, indicating it is perceived as the least significant issue among the listed challenges. However, it is still a notable concern. The moderate standard deviation suggests that its impact varies based on project specifics. Simplifying processes and improving project management training can help manage this complexity.

The analysis shows that challenges such as resistance to change and inadequate allocation of resources are seen as more critical than others like the complexity of project requirements. The variability in standard deviations indicates differing experiences and perceptions across projects and teams. Addressing these challenges effectively requires tailored solutions that

consider the specific contexts and needs of each project. By implementing targeted strategies such as improved training programs, standardized communication protocols, and better resource allocation, the construction industry can enhance its communication and collaboration systems.

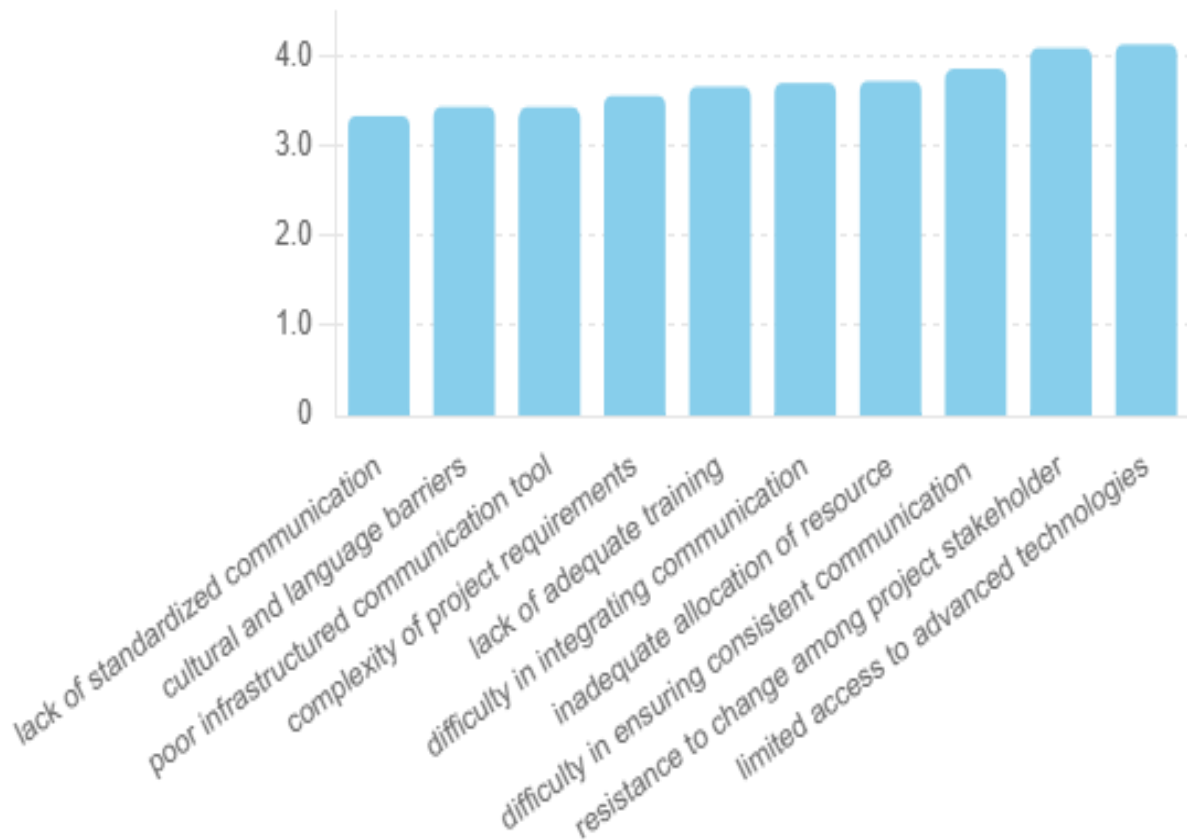


Figure 4-5: challenges of effective communication managemnt system

In the fig 4.6 the graph demonstrates the average values for several challenges affecting communication and collaboration in the construction sector. The challenge with the highest mean value, restricted access to cutting-edge technologies (4.12), highlights how important it is to embrace contemporary technological tools to increase efficiency. Project stakeholders' resistance to change (4.08) is also noteworthy, indicating the necessity of efficient change management techniques to promote the adoption of novel techniques and technologies. Establishing clear communication protocols is crucial, as evidenced by the difficulty in ensuring consistent communication (3.86).

Other significant challenges are the insufficient distribution of resources (3.71) and the difficulty in integrating communication (3.69), which both emphasize the necessity of a

more coordinated approach to communication and improved resource management. Addressing cultural differences and making investments in a strong communication infrastructure is crucial, as evidenced by the presence of linguistic and cultural barriers (3.43) and poorly designed communication tools (3.43). The project requirements' complexity (3.55) indicates that streamlining procedures can lessen communication problems. Lastly, the absence of standardized communication (3.33) emphasizes how important it is to have standardized protocols to decrease errors and increase clarity. The graph's overall findings suggest that resolving these complex issues is essential to enhancing cooperation and communication in the construction sector.

4.3.5. Discussion on Making Recommendations for Improving Communication Management Practices in the Construction Industry

The fourth objective was achieved through the questionnaires asked. The findings show that several recommendations and strategies can be presented by a thorough analysis to enhance the construction industry's communication management procedures. Respondent 1 says that, it's critical to increase access to and utilization of contemporary communication tools. Social media applications, emails, and collaborative project management tools are examples of hardware and software solutions that companies should invest in to facilitate effective communication. Organizing the company to use these platforms uniformly can simplify information sharing and lessen integration challenges.

Respondent 2 says that conducting regular, well-organized meetings is essential to effective communication and collaboration. Continuous engagement and information flow are ensured by scheduling regular meetings at different levels, such as team, project, and stakeholder meetings. The roles of each participant should be clearly defined to improve follow-up and accountability. Establishing mutual respect and trust in teams is also essential. Fostering an inclusive culture through team-building exercises, open-door policies, and individual contribution recognition can help achieve this. By putting in place efficient conflict resolution procedures, disagreements can be promptly addressed and resolved, preserving a productive workplace.

Respondent 3, says that, to address the issue of inadequate training which has been identified as a major challenge adequate training and development are essential. Comprehensive training programs with an emphasis on hard and soft skills like teamwork, leadership, and

communication should be developed by organizations. Facilitating ongoing professional development via workshops, seminars, and courses can help the team stay current with emerging technologies and industry practices.

Respondent 4, states enhancing feedback systems is an additional crucial tactic. Feedback is guaranteed to be constructive and useful if regular feedback loops are established where team members can offer suggestions for enhancements and discuss their opinions on communication techniques. It's crucial to respond to criticism by outlining precise steps and deadlines for improvement.

Respondent 5, states resolving language and cultural obstacles can improve intercultural teamwork. Communication gaps can be filled by offering cultural sensitivity training and language support services, such as employing bilingual employees or providing translation tools. Sufficient distribution of resources and backing from the administration are also essential. Initiatives to improve communication can be sparked by allocating specific resources for communication and guaranteeing the active support and involvement of management.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The general objective of this research is to assess the key determinants of effective communication and collaboration systems in the construction industry. A questionnaire survey was conducted to identify the key determinant factors, the impact of key determinants on construction, and the challenge to implement those key determinants, and strategies to improve the communication management system the following conclusions are taken from the findings.

1. The finding shows that responses to several key factors such as clearly defined roles and responsibilities, and regular meetings among stakeholders have the most strongly supported factors with their mean values of 3.47 and 3.33 respectively and the factor of adequate training on communication and collaboration practice received the lowest score of 2.88, this shows that defined roles and regular meetings among stakeholders are key determinants of effective communication management system. To have effective communication systems in the industry these key determinants should be addressed.
2. The identified major impact of effective collaboration and communication management systems in time, cost, and stakeholder satisfaction, the highest impact was observed in time management with a mean value of 3.31 underscoring the importance of communication in keeping projects on schedule and avoiding delays. Additionally, these key determinants of effective communication management system improves cost management and stakeholder satisfaction by reducing errors, promoting best practices, and meeting stakeholder expectations.
3. The main challenges identified in implementing effective communication management systems include inadequate resource allocation with a mean value of 9.8, integrating issues, with the same 9.8 mean value and inadequate training 9.8 mean value. These challenges highlight the need for a more coordinated approach to inadequate resource allocation and lack of adequate training on technological communication management systems.
4. This research suggests several strategies to enhance communication management practices, including the adoption of advanced communication tools, regular training programs, standardized communication protocols, and regular stakeholder meetings.

Addressing cultural and linguistic barriers and ensuring resource allocation are also critical for improving these practices.

5.2 Recommendation

To enhance communication in the construction industry, it is essential to develop comprehensive training programs that address both technical competencies and soft skills, including teamwork and leadership. These programs equip team members with the necessary skills for efficient and effective interactions. Additionally, organizing regular stakeholder meetings ensures that project progress is discussed, issues are resolved, and objectives are aligned, promoting transparency and fostering a cooperative environment.

Clear role definitions are crucial for minimizing confusion and misunderstandings, thereby enhancing accountability and ensuring smooth collaboration. When team members understand their specific roles, the likelihood of miscommunication is reduced. Investing in advanced communication tools and project management software facilitates real-time information sharing and decision-making, which is vital for maintaining effective communication and timely responses to project needs.

Implementing continuous feedback mechanisms helps identify and address communication gaps, leading to ongoing improvements in collaboration. Regular feedback ensures that stakeholders' needs and expectations are consistently met. Promoting the use of modern communication tools, such as social media applications and other digital platforms, enhances interaction among stakeholders. By focusing on these strategies, construction projects can achieve better communication and collaboration, resulting in more successful outcomes.

By implementing these recommendations, Ethiopia's construction industry can significantly improve its communication and collaboration management systems, leading to better project outcomes, enhanced efficiency, and increased stakeholder satisfaction.

REFERENCE

- Abadi. (2020). (PDF) PRACTICE OF COMMUNICATION MANAGEMENT IN IT PROJECTS: THE CASE OF COMMERCIAL BANK OF ETHIOPIA (CBE) | Abadi Gebreanenia—Academia.edu.
https://www.academia.edu/89388516/PRACTICE_OF_COMMUNICATION_MANAGEMENT_IN_IT_PROJECTS_THE_CASE_OF_COMMERCIAL_BANK_OF_ETHIOPIA_CBE_
- Adejoke. (2016). Effective Communication Among Construction Project Teams as a Tool for Achieving Project Success: A Case Study of Nigeria - ProQuest.
<https://www.proquest.com/openview/d8b0e027f96e5e72270f26c27cc7624e/1?pq-origsite=gscholar&cbl=2026366&diss=y>
- Akinradewo, O., Ojo, L., & Oladunjoye, T. (2019, January 31). A FRAMEWORK FOR EFFECTIVE COMMUNICATION AMONG CONSTRUCTION TEAM.
- Akintelu, S., Oyebola, A., Tihamiyu, S., & Olateju, O. (2023). The impact of project communication management on successful project delivery in the construction industry: A case study. 12, 376–386.
- Akintoye, A., & Main, J. (2007). Collaborative relationships in construction: The UK contractors' perception. *Engineering, Construction and Architectural Management*, 14(6), 597–617. <https://doi.org/10.1108/09699980710829049>
- Amr Sukkar. (2024). (PDF) Effective Management of Construction Project Team: Identifying Leadership Qualities and Responsibilities.
https://www.researchgate.net/publication/378314779_Effective_Management_of_Construction_Project_Team_Identifying_Leadership_Qualities_and_Responsibilities

- Ana Bovan. (2020). (PDF) The Role of Feedback as a Management Tool in Performance Management Program.
https://www.researchgate.net/publication/343152520_The_Role_of_Feedback_as_a_Management_Tool_in_Performance_Management_Program
- Anita Cerić. (2014). (PDF) Communication risk and trust in construction projects: A framework for interdisciplinary research.
https://www.researchgate.net/publication/280064580_Communication_risk_and_trust_in_construction_projects_A_framework_for_interdisciplinary_research
- Ayodeji Emmanuel Oke. (2017). (PDF) Construction Projects and Stakeholders.
https://www.researchgate.net/publication/315364456_Construction_Projects_and_Stakeholders
- Azhar, S., & Abeln, J. (2014). Investigating Social Media Applications for the Construction Industry. *Procedia Engineering*, 85, 42–51.
<https://doi.org/10.1016/j.proeng.2014.10.527>
- Baldwin, A. N., Thorpe, A., Carter, C., & Taylor, G. (1999). Conferencing systems within construction organisations. *Proceedings of the Institution of Civil Engineers - Civil Engineering*, 132(4), 174–180. <https://doi.org/10.1680/icien.1999.31920>
- Bart Kolosowski. (2023, July 28). Building Bridges: How Team Collaboration Enhances Construction Projects. Multiproject.
<https://multiproject.org/learningcentre/construction-team-collaboration/>
- Bonett, D., & Wright, T. (2014). Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. *Journal of Organizational Behavior*, 36. <https://doi.org/10.1002/job.1960>

- Butt, A., Naaranoja, M., & Savolainen, J. (2016). Project change stakeholder communication. *International Journal of Project Management*, 34, 1579–1595.
<https://doi.org/10.1016/j.ijproman.2016.08.010>
- Callistus Tengan. (2018). (PDF) The Role of Monitoring and Evaluation in Construction Project Management.
https://www.researchgate.net/publication/322158442_The_Role_of_Monitoring_and_Evaluation_in_Construction_Project_Management
- Callistus Tengan. (2021). Construction Project Monitoring and Evaluation | An Integrated Approach.
<https://www.taylorfrancis.com/books/mono/10.1201/9781003137979/construction-project-monitoring-evaluation-callistus-tengan-clinton-aigbavboa-wellington-didibhuku-thwala>
- Chimay J. Anumba. (2007). Planning and implementation of effective collaboration in construction projects | Request PDF.
https://www.researchgate.net/publication/235316394_Planning_and_implementation_of_effective_collaboration_in_construction_projects
- Claassen, T., & Verwey, S. (2022). Managing communication in the organisation: An integrated communication management model. *Communicare: Journal for Communication Studies in Africa*, 17, 73–89.
<https://doi.org/10.36615/jcsa.v17i2.1856>
- Creswell, J. W., & Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. Sage publications.
- Dainty, A., Moore, D., & Murray, M. (2006). Communication in Construction: Theory and Practice. Routledge. <https://doi.org/10.4324/9780203358641>

- Dayton, E., & Henriksen, K. (2007). Communication Failure: Basic Components, Contributing Factors, and the Call for Structure. *The Joint Commission Journal on Quality and Patient Safety*, 33(1), 34–47. [https://doi.org/10.1016/S1553-7250\(07\)33005-5](https://doi.org/10.1016/S1553-7250(07)33005-5)
- Edison Atencio. (2021). Problems and challenges in the interactions of design teams of construction projects: A bibliometric study. *Buildings*, 11(10), 461. <https://doi.org/10.3390/BUILDINGS11100461>
- Elena Tsakakis. (2023). Opportunities and challenges in advanced communication technologies in the environment: A case of forest management communications: *Applied Environmental Education & Communication: Vol 23 , No 1-2—Get Access*. <https://www.tandfonline.com/doi/full/10.1080/1533015X.2023.2282457>
- Elnaz Safapour. (2020). (PDF) Analysis of Effective Project-Based Communication Components within Primary Stakeholders in Construction Industry. https://www.researchgate.net/publication/344443258_Analysis_of_Effective_Project-Based_Communication_Components_within_Primary_Stakeholders_in_Construction_Industry
- Elnaz Safapour, S.M.ASCE. (2019). Development of Effective Communication Network in Construction Projects Using Structural Equation Modeling Technique | *Proceedings* | Vol , No. <https://ascelibrary.org/doi/10.1061/9780784482438.065>
- Ernest Kissi. (2019). Communication problems in projects—A research study for construction site projects: A case study of Ghana | Request PDF. https://www.researchgate.net/publication/338104599_Communication_problems_in_projects_-_a_research_study_for_construction_site_projects_a_case_study_of_Ghana

- Fakhro, I., & Larm, A. (2019a). Managing Stakeholder Communication in Construction Projects: A case study of a consultancy company.
<https://doi.org/10.13140/RG.2.2.34033.22883>
- Fakhro, I., & Larm, A. (2019b). Managing Stakeholder Communication in Construction Projects: A case study of a consultancy company.
<https://doi.org/10.13140/RG.2.2.34033.22883>
- Friebel, G., Raith, M., Alonso, R., Bar-Isaac, H., Bolton, P., Cassiman, B., Dewatripont, M., Englmaier, F., Holmström, B., Leppämäki, M., Lentner, M., Marino, T., Matouschek, N., Matsusaka, J., Panunzi, F., Povel, P., Rantakari, H., Rey, P., Tirole, J., & Columbia, F. (2009). Resource Allocation and Organizational Form. *American Economic Journal: Microeconomics*, 2. <https://doi.org/10.1257/mic.2.2.1>
- Gamage, A. (2022a). Importance of Effective Communication to Minimize Disputes in Construction Projects. 10, 128–140. <https://doi.org/10.36347/sjet.2022.v10i07.002>
- Gamage, A. (2022b). Importance of Effective Communication to Minimize Disputes in Construction Projects. 10, 128–140. <https://doi.org/10.36347/sjet.2022.v10i07.002>
- Gamil, Y., & Rahman, I. A. (2017). Identification of Causes and Effects of Poor Communication in Construction Industry: A Theoretical Review. *Emerging Science Journal*, 1(4), Article 4. <https://doi.org/10.28991/ijse-01121>
- Gebbru, M. M. (2021). Addis ababa university college of business and economics, school of commerce graduate studies program department of project management.
- Gudeta, E. D. (2020). The contribution of construction industry to the economic growth of ethiopia.
- Hala Taleb. (2017a). (PDF) An Overview of Project Communication Management in Construction Industry Projects.

https://www.researchgate.net/publication/318729763_An_Overview_of_Project_Communication_Management_in_Construction_Industry_Projects

Hala Taleb. (2017b). (PDF) An Overview of Project Communication Management in Construction Industry Projects.

https://www.researchgate.net/publication/318729763_An_Overview_of_Project_Communication_Management_in_Construction_Industry_Projects

Heravi, A., Coffey, V., & Trigunarysyah, B. (2015). Evaluating the level of stakeholder involvement during the project planning processes of building projects. *International Journal of Project Management*, 33(5), 985–997.

<https://doi.org/10.1016/j.ijproman.2014.12.007>

Hysa, B. (2019). Opportunities and threats presented by social media in project management. *Heliyon*.

https://www.academia.edu/76545265/Opportunities_and_threats_presented_by_social_media_in_project_management

Ingelmo, P. M., Navarro, C., & Sanz, L. J. Á. (2018). Determining factors of success in internal communication management in Spanish companies: The influence of social media. *Corporate Communications: An International Journal*, 23(3), 405–422. <https://doi.org/10.1108/CCIJ-03-2017-0021>

Ismail Fakhro. (2019). (PDF) Managing Stakeholder Communication in Construction Projects: A case study of a consultancy company.

https://www.researchgate.net/publication/338800681_Managing_Stakeholder_Communication_in_Construction_Projects_A_case_study_of_a_consultancy_company

Jinfang Yao. (2023). (PDF) Bridging Language Gaps in Global Construction Projects: The Critical Role of Professional Translators.

- https://www.researchgate.net/publication/371940010_Bridging_Language_Gaps_in_Global_Construction_Projects_The_Critical_Role_of_Professional_Translators
- Justus Ngala Agumba. (2019). Evaluating the relationship between communication management practices and project outcomes: A case study of Eswatini (Swaziland) construction industry | Construction Economics and Building.
- <https://search.informit.org/doi/abs/10.3316/INFORMIT.898562110306362>
- Keyton, J. (2010). Communication and organizational culture: A key to understanding work experiences. Sage Publications.
- Kietzmann, J. H., Silvestre, B. S., McCarthy, I. P., & Pitt, L. F. (2012). Unpacking the social media phenomenon: Towards a research agenda. *Journal of Public Affairs*, 12(2), 109–119. <https://doi.org/10.1002/pa.1412>
- Kish, L. (1965). Sampling Organizations and Groups of Unequal Sizes. *American Sociological Review*, 30(4), 564–572. <https://doi.org/10.2307/2091346>
- Kliem. (2007). Effective Communications for Project Management | PMP, Ralph L. Kliem.
- <https://www.taylorfrancis.com/books/mono/10.1201/9781420062489/effective-communications-project-management-pmp-ralph-kliem>
- Kothari, C. R. (2004). Research Methodology: Methods and Techniques. New Age International.
- Ksenija Čulo. (n.d.). Retrieved January 10, 2024, from <https://hrcak.srce.hr/file/89183>
- Kurt Swart. (2022). (PDF) Challenges and critical success factors of digital communication, collaboration and knowledge sharing in project management virtual teams: A review.
- https://www.researchgate.net/publication/365887684_Challenges_and_critical_suc

cess_factors_of_digital_communication_collaboration_and_knowledge_sharing_in
_project_management_virtual_teams_a_review

- Latif, M. (2023). Analyzing the Key Factors Contributing to Project Delays in the Construction Industry: A Comprehensive Study. *Journal of Development and Social Sciences*, 4. [https://doi.org/10.47205/jdss.2023\(4-III\)85](https://doi.org/10.47205/jdss.2023(4-III)85)
- Lee, N., & Kim, Y. (2018). A Conceptual Framework for Effective Communication in Construction Management: Information Processing and Visual Communication. *Construction Research Congress 2018*, 531–541. <https://doi.org/10.1061/9780784481264.052>
- Lekan Damilola Ojo. (2019). (PDF) A FRAMEWORK FOR EFFECTIVE COMMUNICATION AMONG CONSTRUCTION TEAM. https://www.researchgate.net/publication/330765301_A_FRAMEWORK_FOR_EFFECTIVE_COMMUNICATION_AMONG_CONSTRUCTION_TEAM
- Mengistu, D. G., & Mahesh, G. (2020). Challenges in developing the Ethiopian construction industry. *African Journal of Science, Technology, Innovation and Development*, 12(4), 373–384. <https://doi.org/10.1080/20421338.2019.1654252>
- Minura Jayatilleke. (2021). (PDF) ASSESSMENT OF COMMUNICATION SYSTEMS IN A CONSTRUCTION PROJECT. https://www.researchgate.net/publication/372860391_ASSESSMENT_OF_COMMUNICATION_SYSTEMS_IN_A_CONSTRUCTION_PROJECT
- Musheke, M. M., & Phiri, J. (2021). The Effects of Effective Communication on Organizational Performance Based on the Systems Theory. *Open Journal of Business and Management*, 9(2), Article 2. <https://doi.org/10.4236/ojbm.2021.92034>

- Nahyan, M., Sohal, A., Hawas, Y., & Fildes, B. (2019). Communication, coordination, decision-making and knowledge-sharing: A case study in construction management. *Journal of Knowledge Management*, 23.
<https://doi.org/10.1108/JKM-08-2018-0503>
- Namhun Lee. (2018). A Conceptual Framework for Effective Communication in Construction Management: Information Processing and Visual Communication | Proceedings | Vol , No. <https://ascelibrary.org/doi/10.1061/9780784481264.052>
- Nur Mardhiyah Aziz. (2022). (Pdf) systematic literature review on communication in construction project management: issues among project participants.
https://www.researchgate.net/publication/365194905_systematic_literature_review_on_communication_in_construction_project_management_issues_among_project_participants
- Olaniran, H. F. (2015). On the role of communication in construction projects in Nigeria. *Journal of Environmental Science and Technology*, 2(5), 048–054.
- Othman, A., Gabr, H., Aziz, T., & Hussain, M. (2018). Causes and impacts of poor communication in the construction industry.
- Rahman, S. H. A., Endut, I. R., Faisol, N., & Paydar, S. (2014a). The Importance of Collaboration in Construction Industry from Contractors' Perspectives. *Procedia - Social and Behavioral Sciences*, 129, 414–421.
<https://doi.org/10.1016/j.sbspro.2014.03.695>
- Rahman, S. H. A., Endut, I. R., Faisol, N., & Paydar, S. (2014b). The Importance of Collaboration in Construction Industry from Contractors' Perspectives. *Procedia - Social and Behavioral Sciences*, 129, 414–421.
<https://doi.org/10.1016/j.sbspro.2014.03.695>

- Raynold O. Folland. (1983). Project Management Communications | Journal of Professional Issues in Engineering | Vol 109, No 1.
[https://ascelibrary.org/doi/abs/10.1061/\(ASCE\)1052-3928\(1983\)109:1\(39\)](https://ascelibrary.org/doi/abs/10.1061/(ASCE)1052-3928(1983)109:1(39))
- Safapour, E. (2020). Analysis of Effective Project-Based Communication Components within Primary Stakeholders in Construction Industry. Built Environment Project and Asset Management. <https://doi.org/10.1108/BEPAM-02-2020-0026>
- Safapour, E., Kermanshachi, S., & Kamali Rad, S. (2020a). Analysis of Effective Project-Based Communication Components within Primary Stakeholders in Construction Industry. Built Environment Project and Asset Management.
<https://doi.org/10.1108/BEPAM-02-2020-0026>
- Safapour, E., Kermanshachi, S., & Kamali Rad, S. (2020b). Analysis of Effective Project-Based Communication Components within Primary Stakeholders in Construction Industry. Built Environment Project and Asset Management.
<https://doi.org/10.1108/BEPAM-02-2020-0026>
- Safapour, E., Kermanshachi, S., & Kamalirad, S. (2020). Analysis of effective project-based communication components within primary stakeholders in construction industry. Built Environment Project and Asset Management, 11(2), 157–173.
<https://doi.org/10.1108/BEPAM-02-2020-0026>
- Shehu, R. (2019). Principles Influencing Adherence to Time Management in Construction Project in Gombe State, North Eastern Nigeria. International Journal of Engineering Applied Sciences and Technology.
https://www.academia.edu/53360814/Principles_Influencing_Adherence_to_Time_Management_in_Construction_Project_in_Gombe_State_North_Eastern_Nigeria
- Shelbourn, M., Bouchlaghem, N., Anumba, C., & Carrillo, P. (2007). Planning and implementation of effective collaboration in construction projects. Construction

Innovation: Information, Process, Management, 7, 357–377.

<https://doi.org/10.1108/14714170710780101>

Suleiman, A. (2022). Causes and effects of poor communication in the construction industry in the MENA region. *Journal of Civil Engineering and Management*, 28, 365–376. <https://doi.org/10.3846/jcem.2022.16728>

Suleiman, A., Almasaeid, H., Hussein, N., & Abahre, J. (2023). Addressing the Causes and Effects of Poor Communication in the Jordanian Construction Industry: A Study on Improving Project Performance. *Civil and Environmental Engineering*, 19. <https://doi.org/10.2478/cee-2023-0014>

Taleb, H., Ismail, S., Wahab, M. H., Wan Mohd Rani, W., Mohd, W., Che Amat, R., Malaysia, U., & Lumpur, K. (2017a). An Overview of Project Communication Management in Construction Industry Projects. *International Journal of Industrial Organization*, 1, 1–9. <https://doi.org/10.31039/jomeino.2017.1.1.1>

Taleb, H., Ismail, S., Wahab, M. H., Wan Mohd Rani, W., Mohd, W., Che Amat, R., Malaysia, U., & Lumpur, K. (2017b). An Overview of Project Communication Management in Construction Industry Projects. *International Journal of Industrial Organization*, 1, 1–9. <https://doi.org/10.31039/jomeino.2017.1.1.1>

Talukhaba, A., Mutunga, T., & Miruka, C. O. (2011). Indicators of effective communication models in remote projects. *International Journal of Project Organisation and Management*, 3(2), 127–138. <https://doi.org/10.1504/IJPOM.2011.039817>

WEF. 2016. (n.d.). Retrieved December 10, 2023, from https://www3.weforum.org/docs/WEF_Shaping_the_Future_of_Construction_report_020516.pdf

Zainal, M., Ramli, M. Z., & Hassan, F. (2020). Application Of Social Media As Project Communication Tools For Construction Project: A Snapshot Review. 1561–1573.

APPENDIX



Adama Science and Technology University

School of Civil Engineering and Architecture

Office of Graduate Studies

My name is Bitset Gizaw Abdo from Adama Science and Technology University. I am researching **“Assessment of Key Determinants of effective collaboration and Communication Management System in Ethiopia Construction Industry”**: scope of GC1 contractors for partial fulfillment of the requirements for the award of the degree of Masters of Science (MSC) in construction management engineering. All information collected through this interview will only be used for academic purposes.

If you need to know the final results of the study, you may contact me via E-mail or mobile.

Thank you in advance for your voluntary participation.

Kind Regards

Bitset Gizaw

Mobile: +251993313596

Email: bitsetgizaw06@gmail.com

Semi-structured interview questions

Section A: Background information

	response
1. Age	☐ < 25 years ☐ 25-30 years ☐ > 30 years
2. Gender	☐ Male ☐ Female
3.Educational Qualification	☐ BSc Degree ☐ Masters ☐ above
4. Years of Experience in the Construction Industry	☐ < 10 years ☐ 10-20 years ☐ > 30 years
5. Position/Role in the company	☐ Project manager ☐ Office engineer ☐ Project fellowship ☐ Contract engineer
6. Company/Project Name (optional)	

Section B: Assessment of Key Determinants of Effective Communication and Collaboration System

Instructions: Please rate the following key determinants of effective communication and collaboration system statements based on your company's experience and perspective within the Ethiopian construction industry. (1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree)

1. The availability of modern communication tools (e.g., email, project management software) enhances collaboration among stakeholders.	5	4	3	2	1
2. Regular meetings and discussions among project teams facilitate effective communication and coordination.	5	4	3	2	1
3. Clearly defined roles and responsibilities contribute to smoother collaboration within construction projects.	5	4	3	2	1
4. Effective communication channels between project managers, contractors, and subcontractors are essential for project success.	5	4	3	2	1
5. Adequate training in communication and collaboration practices improves overall project performance.	5	4	3	2	1

6. Cultural differences among project stakeholders sometimes hinder effective communication and collaboration.	5	4	3	2	1
7. Trust and mutual respect among team members are critical for fostering collaboration in construction projects.	5	4	3	2	1
8. The use of standardized communication protocols and procedures enhances clarity and reduces misunderstandings.	5	4	3	2	1
9. Adequate allocation of resources (time, budget, personnel) to communication and collaboration efforts positively impacts project outcomes.	5	4	3	2	1
10. Regular feedback mechanisms help identify communication gaps and improve collaboration over time.	5	4	3	2	1

Section C: The impacts of key determinants of effective communication and collaboration systems.

Instructions: Instructions: Please rate the following impact of effective communication in construction industry statements based on your experience and perspective within the Ethiopian construction industry. (1 = strongly negative impact. 2 = somewhat negative impact 3 = Neutral 4 = positive impact 5 =strongly positive impact)

Impacts	5	4	3	2	1
1. Enhances team interactions					
2. Reduces misunderstandings					

Impacts	5	4	3	2	1
3. Reduces errors and improves accuracy					
4. Fosters a positive work environment					
5. Modernizes stakeholder's knowledge					
6. Promotes teamwork and collaboration					
7. Ensures consistency in project execution					
8. Ensures needs and expectations are met					
9. Encourages adoption of best practices					

Section D: Challenges Faced in Collaboration and Communication

Instructions: Please rate the following challenges regarding in implementation of effective communication and collaboration system statements based on your experience and perspective within the Ethiopian construction industry. (1 = strongly negative impact. 2 = somewhat negative impact 3 = Neutral 4 = positive impact 5 =strongly positive impact)

Challenges and Barriers	5	4	3	2	1
1. Lack of adequate training and education on communication management tools and techniques.					
2. Difficulty in integrating different communication platforms and technologies.					
3. Resistance to change among project stakeholders.					
4. Inadequate allocation of resources for implementing and maintaining communication systems.					
5. Cultural and language barriers among project participants.					

6. Lack of standardized communication protocols and procedures.					
7. Poor infrastructure or connectivity issues affecting communication tools and systems.					
8. Limited access to advanced communication technologies in certain project locations.					
9. Difficulty in ensuring consistent communication among dispersed project teams.					
10. Complexity of project requirements and information flow.					

Section E: Making Recommendations and Strategies:

Recommendations and Additional Thoughts (Optional): We value your expertise and insights. If you have any recommendations or additional thoughts regarding the key determinants of effective communication and collaboration systems in the construction industry, please share them here. Your recommendations will help inform our research and contribute to the development of practical solutions.

Thank you for your time!

Table 3-1: Company name.

Company Name	Company Location
ABIY ATNAF	Addis Ababa City Administration
AFEWORK GIDEY	Addis Ababa City Administration
AKI WAS BUILDING	Addis Ababa City Administration
ANSIF	Addis Ababa City Administration
B.G.M	Addis Ababa City Administration
BERTA CONS...	Addis Ababa City Administration
BRIDGE	Addis Ababa City Administration
CHINA MCC	Addis Ababa City Administration
CHITA	Addis Ababa City Administration
DERIBA DEFRSHA	Addis Ababa City Administration
ENEY GENERAL	Addis Ababa City Administration
ESUBALEWU AREAYA	Addis Ababa City Administration
FALU G.CONSTRUCTION	Addis Ababa City Administration
G/HIYWOT EKUBEMARIYAM	Addis Ababa City Administration
GEMSHU BEYENE	Addis Ababa City Administration
GENET	Addis Ababa City Administration
GEOMETRA LUIGE	Addis Ababa City Administration
HAVERIM CONS...	Addis Ababa City Administration
HAYLUGENET&FRIENDS	Addis Ababa City Administration
HAZI AYE	Addis Ababa City Administration
HEYLE FEKERTE & FREINDS	Addis Ababa City Administration
KERAFIT CONS...	Addis Ababa City Administration

KIBISHI CONSTRUCTION	Addis Ababa City Administration
KIROS LAND	Addis Ababa City Administration
M.C.G CONSTRUCTION PLC	Addis Ababa City Administration
MAHIDER AND MINASE	Addis Ababa City Administration
MAN GENERAL CONS...	Addis Ababa City Administration
MARKAN TRADING	Addis Ababa City Administration
MEKELAKEYA	Addis Ababa City Administration
MELKEN CONS...	Addis Ababa City Administration
MIDROC CONSTRUCTION	Addis Ababa City Administration
MIKADA CONS...	Addis Ababa City Administration
N.K.H	Addis Ababa City Administration
RADAR CONSTRUCTION	Addis Ababa City Administration
RAMA CONS...	Addis Ababa City Administration
SAFARI CONSTRUCTION	Addis Ababa City Administration
SHIMELES & MESELE	Addis Ababa City Administration
SANITAMARIYAM CONS...	Addis Ababa City Administration
SARA DEJENE	Addis Ababa City Administration
SENAN CONSTRUCTION	Addis Ababa City Administration
SINO HYDRO	Addis Ababa City Administration
SUNSHINE	Addis Ababa City Administration
T.N.T CONSTRUCTION	Addis Ababa City Administration
TEKLEHAYMANOT ASGEDOM	Addis Ababa City Administration
TESHOM DEGENE	Addis Ababa City Administration

TILAHUNABEBE	Addis Ababa City Administration
YARED T/MEDIHN	Addis Ababa City Administration
YEYEBESE	Addis Ababa City Administration
YOTEK	Addis Ababa City Administration

Key Determinant	Agree	Disagree	Neutral	Strongly Agree
Availability of Tools	29	3	7	10
Regular Meetings	23	2	2	22
Defined Roles	23	1		25
Communication Channels	23	3	11	12
Adequate Training	27	6	5	11
Trust and Mutual Respect	23	3	5	18
Protocols and Procedures	26	5	6	12
Adequate Allocation of Resources	26	5	12	6
Regular Feedback	25	2	3	19
Involvement of All Stakeholders	23	6	8	12
Transparency and Openness	28	1	3	17
Flexibility and Adaptability	27	3	1	18
Project Leadership and Management	25	1	4	19
Continual Monitoring and Evaluation	24	3	11	11
Accessibility of Communication	29	3	7	10

Table 4-7: Key determinants of effective communication and collaboration system

Challenges	Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree	Mean	Standard Deviation
Lack of adequate training	28	6	10	5	0	9.8	10.78
Difficulty in integrating communication	29	3	13	4	0	9.8	11.78
Resistance to change among project stakeholders	28	3	4	14	0	9.8	11.45
Inadequate allocation of resources	29	4	4	12	0	9.8	11.58
Cultural and language barriers	26	3	10	10	0	9.8	10.06
Lack of standardized communication	21	7	13	11	0	10.4	7.73
Poor infrastructure for communication tools	19	7	12	14	0	10.4	7.23
Limited access to advanced technologies	21	5	9	17	0	10.4	8.59

Difficulty in ensuring consistent communication	25	6	13	8	0	10.4	9.4
Complexity of project requirements	28	9	8	4	0	9.8	10.78

Table 4-8: challenges of effective communication and collaboration system