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**THE POTENTIAL OF USING ARTIFICIAL INTELLIGENCE  
IN COMMUNICATIONS WITHIN PROJECT MANAGEMENT**

School of Technology  
2024

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## ABSTRACT

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Title	The Potential of Using Artificial Intelligence in Communications within Project Management
Year	2024
Language	English
Pages	91
Name of Supervisor	Adebayo Agbejule

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This study aims to develop an in-depth understanding of traditional communication issues in project management and explore the potential of artificial intelligence to address these challenges. It reviews how artificial intelligence can help to solve traditional communication issues in project work and influence on the improvement of mutual understanding and increase the level of communication in the project team. The study further identifies mechanisms by which AI can enhance communication effectiveness in project management.

A systematic literature review was conducted, focusing on 54 articles published between 2004 and 2024. Content analysis and descriptive analysis were used to respond to the research questions.

The study identifies several critical communication issues in project management, including encoding/decoding competency gaps, virtual team breakdowns, inadequate communication planning and difficulties in measuring communication effectiveness, cross-cultural misalignments, weak stakeholder interaction, lack of communication insights/skills, and the complexity of communication in large-scale projects. AI offers promising solutions to these challenges by enhancing communication speed, promoting positive emotional language, providing real-time insights, and facilitating cross-cultural communication.

This study provides a framework for project managers on how AI can be integrated into communication strategies to enhance project outcomes. It highlights the importance of combining AI capabilities with human expertise to achieve optimal communication effectiveness.

**Keywords** Traditional communication issues, artificial intelligence assistance, communication problems, project communication management, target solution, stakeholder communication.

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## 1. INTRODUCTION

Currently, project management is the basis for the success of most companies around the world. Updating products, introducing new technical and organizational solutions is a necessity for successful work. Modern challenges require innovations rather than just changes. Projects become a means not only to improve existing products and services, but also to create completely new ones that meet the requirements of the modern market. The tasks solved within the framework of projects are becoming more and more technically complex, and the formation of a target solution requires the concentration of theoretical and practical knowledge, including the latest developments. Technically complex projects thus require expertise, the ability of experts to cooperate and bridge differences in multidisciplinary teams, creativity, as well as clear constraints (Snowden & Boone, 2007; Boonstra & Reezigt, 2023).

Due to the complexity of the tasks, the formation of the correct target solution of the project is often difficult due to the large number of solutions and the varying degree of awareness of the project stakeholders. In my experience, a significant and difficult stage in project activity is the formation or selection of a target solution to solve the task of the project, such as its functionality, external user design, and implementation deadlines. Project organizations need strategies that shape perceptions and support interaction through the allocation of resources, clear responsibilities, the right incentives, and flexible organizational structures. (Joos et al., 2020). At this stage, there is often a miscommunication between the owner of the process - the customer and the contractor (executor) - often the developer of the technical solution (IT department /IT company). This mutual misunderstanding is usually associated with insufficient technical skills and knowledge of the IT solutions market on the part of the customer and a lack of understanding of the business process, as well as difficulties in facilitating the formalization of requirements on the part of the contractor. Their findings also confirmed that the role of

managers is crucial, as they need to be aware of what influences their analyses and interactions (Joos et al., 2020).

Thus, there is a potential for research and search for solutions to combine the approaches of initially different parties to negotiations in order to simplify their interaction, increase the effectiveness of negotiation activities, in particular, in reducing the time for the negotiation process and in simplifying the development of an optimal solution. An assistant in such a situation can be a unique and capacious database that can quickly provide the necessary and most relevant information in the context of the project - artificial intelligence. People with different levels of technical training are increasingly resorting to the help of artificial intelligence in order to find answers to questions in the fields of knowledge they need. AI-assisted communication in projects using ML demonstrates the potential to improve team performance (Taboada et al., 2023). In this regard, there is a reason to assume that artificial intelligence has the potential to solve certain communication problems between developers and customers.

When managing projects, companies are increasingly thinking about using the capabilities of artificial intelligence as a necessary assistant. AI assists project managers in handling the complexities of these integrated systems. Interestingly, the application of AI extends beyond typical PM processes to include “other processes” such as Portfolio Analysis, General Framework, Prediction/Estimation/Forecasting, Optimization, and Decision Support Systems (DSS). (Nenni et al., 2024). The use of the most comprehensive information base and algorithms for machine data analysis could make it possible to solve complex tasks more effectively, optimize processes and predict possible risks, which significantly increases the chances of successful project implementation. Under the guidance of experienced project managers, as well as with the support of artificial intelligence, it may become easier to achieve effective results that will lead to business growth and improve the quality of life.

Of course, like any activity, project activity needs constant updating and support so that it improves over time and acquires new tools that increase its effectiveness. This thesis aims at studying the existing problems in find a mutually acceptable solution between the stakeholders of the project and the potential of one of such tools - artificial intelligence, possible assistance to them in reaching agreements among themselves when developing an optimal targeted solution to the project task. This research focuses on the possible role of artificial intelligence in supporting project stakeholders, optimizing decision-making processes and improving the effectiveness of project activities. The basis for the research is theories and concepts in the field of project management, psychology of decision-making and the development of artificial intelligence. The results of this study will be widely applicable in the practice of project activities in various industries and organizations.

### **1.1 Research Objectives and Questions**

The research objective is to discover, whether using artificial intelligence to support project stakeholders in decision-making can help to improve project efficiency, reduce time and costs, and improve the quality of results achieved. This is relevant for both large corporations and small enterprises that seek to optimize their project activities and increase competitiveness. In addition, the use of artificial intelligence in project management can be a key factor in successful adaptation to rapidly changing market conditions and customer requirements.

In connection with the above, the research questions are as follows:

- 1) What traditional communication issues arise when forming a target solution within the framework of a project?
- 2) How can artificial intelligence influence traditional communication issues that arise in the process of forming a target solution within the framework of a project?

## 1.2 Theoretical Framework

The research is conducted in the form of a literature review using my previous experience combined with the experience of experts.

A large number of problems related to communication in business processes have already been raised and discussed in various scientific articles, which already constitute a large amount of knowledge available for research and systematization. The purpose of this research will be to explore and summarize these problems in order to answer the first research question.

The second research question about the impact of artificial intelligence will be explored by examining existing relevant scientific literature, articles, and possibly new case studies to share use cases and see if there is a match that could potentially offer a solution to the constantly (traditionally) emerging problems in the field of project management.

This thesis will explore and analyse scientific articles and books on the subject of:

- forming a list of traditional communication issues that arise when developing a target solution of the project;
- search for experience in the use of artificial intelligence in negotiations within the project activities;
- detection the practically applied ways of using artificial intelligence;
- identification the advantages and disadvantages of using artificial intelligence (when confirming its use in these situations).

The conducted theoretical research should lead to the possibility of its further practical application both in further scientific research to improve and expand the possibilities of interaction with an intellectual assistant, and in practical use in practical project activities to smooth out conflicts and find common points of



contact and mutual understanding between the parties agreeing on the final target solution for the implementation of the project. Moreover, it is assumed that the results of this study can help at other stages of project activities, when the project parties need to come to a joint decision on a complex issue, and there are a lot of such cases in project activities.

## **2. METHODOLOGY**

Literature review is using the experience of experts expressed in their scientific articles and my extensive previous practical experience in working on projects and understanding the issue of reaching agreements when forming a solution within the framework of project management.

A large number of problems related to communication, discussion and decision-making in project activities have been raised and discussed in various scientific articles. The purpose of this study will be to summarize these issues and study the impact of artificial intelligence on solving these problems.

The research was conducted by examining the existing relevant scientific literature that revealed this topic and could potentially offer a solution to the constantly (traditionally) emerging problems in the field of communication in project management.

To find suitable articles on project communication management, a systematic approach was applied using various academic databases and search engines.

### **2.1 Identifying Relevant Keywords**

The first step was to identify the appropriate keywords, related to the topic of interest in communication problems within project management, as well as the questions about existing traditional communication issues, arising when forming a target solution within the framework of a project, and how can artificial intelligence influence those traditional communication issues.

Thus, the keywords for finding suitable articles are: traditional communication issues, artificial intelligence assistance, communication problems, project communication management, target solution, stakeholder communication.

These keywords have been carefully selected to reflect various aspects of communication topics and strategies in the context of project management and the questions asked.

## **2.2 Search by the Search Tools**

The research was based on scientific articles published and searched on well-known resources: Google Scholar, Science Direct, Sage Journals, Emerald insight, MDPI, Research Gate, with the help of which the search for articles, suitable for the subject of the study was carried out.

The most extensive resource containing the maximum quantity of scientific articles with links to them is Google Scholar, a widely used academic search engine that indexes scientific literature in various disciplines, although other sources listed provided significant articles, sometimes with access through the Tritonia University Library.

The following steps have been taken to search for relevant articles in Google Scholar, as well as on other resources:

- access to full-text versions of promising articles by VAMK subscription in the Tritonia library, if they were not publicly available;
- entering the corresponding keywords in the search bar, for example, “traditional communication issues” and “stakeholder communication”. Keywords were used in the search mainly together with “project management” words in order to focus the search on the main area of research, thereby expanding the possibilities of high-quality, deep and accurate search for suitable articles;
- filtering the the results by relevance, publication date and other necessary criteria.

Searching for articles according to relevance allows to get the most suitable articles for research purposes at the top of the sample.

### **2.3 Reviewing and selecting Relevant Articles**

After conducting a search on various platforms and sources, the next step was to carefully examine the search results. This included:

- examining the title and annotations in the search results to identify potentially relevant articles;
- selection of available full-text versions of promising articles, or checking the possibility of full access to the article through the Tritonia library;
- studying Abstract and Introduction chapters, and thus prioritizing articles based on their quality, significance and novelty, in which the topic under study was covered as comprehensively as possible and various aspects of the research issue were considered.

In case read coincided with the above conditions and the topic of the study, the article was selected for further complete research.

### **2.4 Studying the Selected Articles**

Then the selected articles were used as a basis for further analysis, generalization and citation on the topic of project communication management.

It is important to note that the search process was iterative, and additional searches were conducted as needed to fill in any gaps or explore specific subtopics in more depth. The goal was to produce a comprehensive and high-quality set of articles for conducting research and writing a thesis on this important topic in the field of project management.

## 2.5 Quantitative Indicators when Selecting Articles

Initially, when searching by keywords, for example, in Google Scholar, hundreds of thousands of found options appear in the search results. However, as in any similar search, the further the page with the selected options is from the first options, the less the options found correspond to the needs of the query. The search was conducted by relevance, so there was no need for a detailed study of all the thousands of selected by the search engine variants, as most relevant articles appear on a first pages. In addition, a sufficiently large number of search words and their combinations made it possible to repeatedly create a new combination for the search and get new articles, relevant for initial study on the first 2-3 pages of the search, regardless of the specified by the counter the total number of articles found.

**Table 1.** Quantity of found and cited articles searched in named sources.

Search keyword	Google Scholar		Science Direct		Sage Journals		Emerald		MDPI		Research Gate		Total found	Total cited
"traditional communication issues"	22	4	1	1	0	0	2	1	0	0	1	0	26	6
"artificial intelligence assistance"	20	6	2	1	4	2	3	1	4	1	2	2	35	13
"communication problems"	12	5	2	0	2	1	1	0	3	2	3	1	23	9
"miscommunication"	8	4	1	0	1	1	0	0	1	1	1	0	12	6
"project communication management"	12	3	2	0	1	0	2	0	2	1	0	0	19	4
"communication breakdowns"	8	5	1	1	3	1	3	2	1	0	1	1	17	10
"target solution"	10	2	2	0	1	0	3	1	2	0	0	0	18	3
"stakeholder communication"	12	3	1	0	2	0	1	0	1	0	1	0	18	3
<b>Total found</b>	104		12		14		15		14		9		<b>168</b>	
<b>Total cited</b>		32		3		5		5		5		4		<b>54</b>

The search results are presented in Table 1, which shows the total number of articles that were found by keywords and sources, where they were found, as well as the number of articles from them that were used as sources in this study. As a result of the above-mentioned systematic approach, 168 articles were selected for detailed study, which, according to the description in Abstract and Introduction, met the needs of the request. After a more detailed review of the content of these articles, 54 articles were selected that answered the task as relevant as possible for citation in the study.

### **3. LITERATURE REVIEW**

#### **3.1 Communication Process**

Communication is a fundamental aspect of human interaction, serving as the cornerstone of our social and professional relationships. At its core, the communication process involves the exchange of information, ideas, and emotions between individuals or groups. In both personal and business contexts, effective communication is essential for fostering understanding, building relationships, and achieving common goals.

In the business world, communication takes on even greater significance. As (Bucața and Rizescu 2017 p. 49) note, communication is one of the most important levers of management that a company can implement for the formation of teams and achieving valuable performance. This highlights the critical role that communication plays in organizational success, enabling teams to collaborate, share knowledge, and work towards shared objectives.

The importance of communication in negotiations cannot be overstated. (Adinda et al. 2022, p. 1) emphasize that negotiations that involve two or more parties in reaching an agreement cannot go off from the communication in its process. Effective communication during negotiations allows parties to express their needs, understand each other's perspectives, and work towards mutually beneficial solutions. It is through this process that compromises are reached and agreements are forged.

However, the path to successful communication is not always smooth. In negotiations, various problems can arise that hinder effective dialogue. These may include misunderstandings, cultural differences, emotional barriers, or conflicting interests. Schoop (2021) points out that communicative conflicts are the most problematic type of conflict in electronic negotiations. This underscores the need for

negotiators to be aware of potential communication pitfalls and to develop strategies to overcome them.

To address these challenges, negotiators must cultivate strong communication skills. This includes active listening, clear articulation of ideas, and the ability to interpret both verbal and non-verbal cues. As Adinda et al. (2022) suggest, a negotiator with good communication skills must be able to convey a message that the other party quickly understands and also be able to read or understand the intent of the message sent by another party, both verbally and non-verbally.

The communication process is a vital component of human interaction, particularly in business and negotiations. By recognizing its importance and working to improve communication skills, individuals and organizations can enhance their ability to collaborate, resolve conflicts, and achieve success in their efforts.

### **3.2 Communication in Project Management**

As practice of project management shows, reaching agreements and forming a common position between the stakeholders of the project is a quite challenging task at each stage of the project life cycle. Perhaps one of the most difficult stages is the formation of a target solution, when the customer quite often eager to get the maximum, while the contractor, for various reasons, is not able to perform such product, at least within the available time budget. Moreover, these reasons may lie both in the socio-cultural plane, when all kinds of psychological factors are influencing, and in the plane of awareness, knowledge of technical, financial and other similar aspects that affect the project and decisions made within the framework of project management.

There are many reasons why the participants in the discussion of the final solution of the project cannot agree among themselves and form this target solution, the main ones will be researched further.

### **3.3 Barriers to Communication Process**

#### **3.3.1 Encoding/Decoding Competency Gaps**

One of the important communication problems is the lack of effective message encoding skills for clear transmission and accurate decoding of received messages. This can lead to misunderstandings, inconsistencies, and communication failures between project teams, stakeholders, and customers.

Ability to effectively encode and decode messages is crucial for the success of the project results show a significant communication-performance relationship. Specifically, project managers' competency in decoding and encoding are significantly associated with team member satisfaction, while project managers' encoding is significantly associated with project team productivity (Henderson, 2004).

The fundamental nature and definition of competencies such as coding and decoding in the field of communication is fully covered by the author at the core of the communication process are two major elements: encoding and decoding. Encoding is a type of active sending of messages and technically refers to the process of constructing stimuli that may represent meaning. Decoding, on the other hand, is a type of active listening to messages, which technically refers to the process of turning sensations into meaning or patterned codes (Henderson, 2004).

The methodology used in the study involved measuring project managers' communication competence using the Communicator Competence Scale by Monge et al., which was specifically designed as an other-oriented scale for the workplace. Its parsimony emphasizes encoding and decoding, and de-emphasizes the broader social and interpersonal characteristics of competence (Henderson, 2004).

The findings of the study underscore the significant association between project managers' competencies in encoding and decoding, and their team members' satisfaction and productivity. The finding that project managers' encoding explains



21% of the variance in project team productivity is a meaningful contribution to the literature. It establishes an important communication-performance link. (Henderson, 2004).

In another study, Henderson (2008) elaborates on the definitions of encoding and decoding: encoding refers to all of the activities involved in transforming information into messages. Speech (and its derivative, writing) are encoding activities in communication. Decoding involves the transformation of sensations into meaning. In communication, decoding activities include listening and reading (Henderson, 2008). The study further confirms that the findings indicate that project managers' competencies in decoding and encoding communication significantly contribute to team member satisfaction and productivity (Henderson, 2008). This suggests that gaps in these competencies can lead to misunderstandings and reduced productivity.

For project managers, the evidence is clear that developing, learning from, and refining their decoding and encoding communication competencies, through training and/or professional development activities, can have a positive impact on their team members' satisfaction and productivity (Henderson, 2008). This recommendation implies that gaps in these areas are problematic and need to be addressed.

More clear and comprehensive definition of the concepts of encoding and decoding in the field of communication was given by Culo & Skendrovic (2010) to translate thoughts or ideas into a language that is understood by others and decoding as to translate the message back into meaningful thoughts or ideas.

The authors further explain that the sender is responsible for making the information clear and complete so that the receiver can receive it correctly, and for confirming that it is properly understood. The receiver is responsible for making sure that the information is received in its entirety, understood correctly, and

acknowledged (Culo & Skendrovic, 2010). This division of responsibilities highlights the importance of both encoding and decoding in effective communication.

Another aspect is the difficulty of accurately encoding and decoding messages in virtual teams, researched by Daim et al. (2012), who explored the challenges of communication in global virtual teams, noting that communication breakdown can wreak havoc on a project as team members struggle to effectively communicate and work with one another. They point out that increased reliance on electronic communication can lead to misunderstandings, which can erode team communication and productivity, and inhibit the type of social interaction within a team that leads to innovation and success.

The study also notes that humans communicate largely through body language and tone of voice. These elements are present in face-to-face communication, and allow us to derive a wealth of accurate information and meaning from tone of voice and facial expressions, even when they contradict what is being said (such as when a person is lying or speaking in a delirious way). Only tone of voice is conveyed through phone communication, and neither of these elements is present when communication occurs via a computer. In some cases, this can lead to anxiety, confusion, and miscommunication (Daim et al., 2012). This underscores the challenges in decoding messages accurately without nonverbal cues.

The study further explains that people seem to perceive electronic media as more or less “natural” (e.g., easy to use) depending on how the media incorporate face-to-face communication elements). It is noted that it is much harder to communicate knowledge than information through unnatural media (e.g., email) and that communication through unnatural media is more ambiguous. This ambiguity can lead to misunderstandings and communication breakdowns. (Daim et al., 2012)

In conclusion, the authors collectively highlight the critical role of encoding and decoding competencies in project management. When applied to the context of

project management, competency in encoding and decoding behaviours may play an important part in achieving project outcomes (Henderson, 2004). Gaps in these competencies can lead to misunderstandings, misalignments, and communication breakdowns, which can negatively impact team satisfaction, productivity, and overall project outcomes. The importance of addressing these gaps through training and development is evident to ensure effective communication and project success.

### **3. 3. 2 Virtual Team Breakdowns and Virtual Interaction Challenges**

Remote and distributed project teams face unique communication hurdles such as cultural differences, language barriers, technology constraints and lack of face-to-face interaction, which can hinder team cohesion, collaboration and performance.

The serious problem of communication in global virtual teams (GVT), where traditional communication methods such as e-mail do not allow communication between team members, is highlighted by Daim et al. (2012): broadcast email communication is not effective anymore. Organizational health survey results from one large semiconductor company continually reveal that employees do not feel connected to what is happening inside their GVTs.

Some common issues reported by GVT members are: (a) why can't I just do a search and quickly find someone who can help me? (b) There are too many meetings to make one decision. (c) We reinvent the wheel over and over again within the same organization (Daim et al., 2012). These issues highlight the inefficiencies and frustrations that arise from poor communication practices in virtual teams.

In addition, cultural differences and language barriers are serious obstacles that virtual teams must overcome in order to function effectively. Dispersed work groups in which members are located in different countries face unique cultural differences that can affect the overall success of the group's performance.

Language barriers and differences in cultural expectations and understandings can have a profound impact on the group's overall performance. (Daim et al., 2012)

The lack of personal interaction in virtual teams can hinder the development of interpersonal relationships, leading to misunderstandings and reduced productivity. In many cases, geographically dispersed teams can present unique challenges to building effective interpersonal relationships between remote team members. Increased reliance on electronic communication can lead to misunderstandings, which can erode team communication and productivity, and inhibit the type of social interaction within a team that leads to innovation and success. (Daim et al., 2012)

Trust is a critical component that is often difficult to establish in virtual teams due to the lack of physical presence and direct interaction. Research has indicated that one of the major reasons for the failure of GVTs is related to building trust. Trust is essential to any GVT and allows people to engage in risk-associated activities that they cannot control or monitor (Daim et al., 2012). Because they lack verbal and nonverbal cues which naturally exist in face-to-face teams, virtual teams are faced with unique obstacles toward effective communication (Pitts et al., 2012, p. 22). The absence of these cues in virtual environments can lead to significant communication challenges.

In virtual project teams, the process of improving trust among team members is usually through communication and connection of virtual project team members (Dube & Marnewick, 2016, p. 6). Building trust through communication is vital for the success of virtual teams.

The lack of verbal and non-verbal signals in communication can also reduce the quality of interaction in virtual communication. In face-to-face communication, verbal cues (i.e., tone of voice, voice inflections, verbal hesitations, and volume),

as well as nonverbal cues (i.e., facial expressions and body movements), are important sources of both task and social information (Pitts et al., 2012).

According to media richness theory (Daft & Lengel, 1986), this reduction or absence of social information (compared to traditional face-to-face teams) ultimately reduces the quality of communication among virtual team members (Pitts et al., 2012). The theory suggests that the lack of rich media in virtual communication can lead to poorer communication quality.

This empirical evidence supports the assumption that virtual teams face greater communication challenges than traditional teams. Empirical research investigating team functioning within virtual teams has shown that the lack of verbal and nonverbal cues in virtual teams results in reduced quality of communication, compared to traditional teams). In addition, virtual teams communicate less information as compared to face-to-face teams (Pitts et al., 2012). The reduced amount of information exchanged in virtual teams can hinder effective collaboration and decision-making. According to Pitts et al (2012), relationship development in virtual teams occurs at a slower rate. The slower pace of relationship building can impact team cohesion and performance.

Effective communication is crucial for the success of any project, especially in virtual teams, that is stressed by the authors. Effective communication is one of the main determinants of successful project realization (Culo & Scendrovic, 2010). It is the lifeblood of any human relations and those constitute the basis of successful cooperation and joint realization of tasks (Muszynska, 2018).

Communication is the backbone of a project team's effectiveness and has indisputably played a pivotal role in virtual project teams which make use of technology to facilitate communication and coordinate tasks required to achieve the desired team goals and deliverables (Dube & Marnewick, 2016).

Effective communication is an essential factor of project success, keeping project stakeholders on track to achieve project objectives and allowing to overcome issues and resolve conflicts during its realization (Muszynska, 2018, p. 67). Effective communication helps in achieving project goals and resolving conflicts. To communicate effectively, proper communication management schemes must be adopted to ensure appropriate distribution and sharing of project information (Muszynska, 2018).

Project managers should monitor the communication among team members to avoid messages that could be construed negatively and that could have a negative impact on the team's performance (Dube & Marnewick, 2016). Monitoring communication is crucial to prevent misunderstandings and negative impacts on team performance.

How virtual project team members communicate with one another affects the overall team performance and outcome, as decisions can be made much easier and the flow of information and feedback is prompt (Dube & Marnewick, 2016). The quality of communication directly influences the performance and outcomes of virtual teams.

The project manager should clearly establish early enough the common language to be used by team members across the functional, cultural, organisational and geographic boundaries, and members should be able to communicate in the agreed-upon language (Dube & Marnewick, 2016). Establishing a common language is essential for effective communication in virtual teams.

The rapid development of communication technologies has made it possible for people from different parts of the world to collaborate in virtual project teams (Dube & Marnewick, 2016). These quotations collectively illustrate the various communication challenges faced by virtual teams, including cultural differences, language barriers, technology constraints, and the lack of face-to-face interaction.

These challenges can hinder team cohesion, collaboration, and performance, ultimately affecting project management and the ability to reach agreements between project customers and executors.

### **3. 3. 3 Inadequate Communication Planning**

Failure to develop a comprehensive communication management plan outlining strategies, channels, responsibilities and cadence can severely disrupt information flow, alignment and shared understanding among project stakeholders.

Inadequate communication planning can severely disrupt information flow, alignment, and shared understanding among project stakeholders. To ensure the success of a project much information, including expectations, goals, needs, resources, status reports, budgets and purchase requests, needs to be communicated on a regular basis to all major stakeholders. Project communication can often be more difficult due to challenges unique to project management. Many projects are short-term, and therefore project communication is temporary. It is truly critical for project managers to get the message across right the first time to avoid failures in the communication process (Culo & Skendrovic, 2010).

This highlights the importance of having a structured communication plan from the outset. Project Communication Management is the knowledge area that employs the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information. Project communication is the responsibility of everyone on the project team. The project manager, however, is responsible to develop the project communication management plan. Planning communications is the process of determining the project stakeholder information needs and defining a communication approach. The process responds to the information and communications needs of the project stakeholders; for example, who needs what information, when they will need it, how it will be given to them, and by whom. While all projects share

the need to communicate project information, the informational needs and methods of distribution vary widely. Identifying the information needs and determining a suitable means of meeting those needs are important factors for project success. Improper communication planning will lead to problems such as delay in message delivery, communication of sensitive information to the wrong audience, or lack of communication to some of the required stakeholders (Culo & Skendrovic, 2010).

Communication Management needs to be planned during the beginning of the project. Communication Planning involves determining the information and communication needs of the stakeholders; Who needs what information and when, What type of information will they need and in what detail? What will your goal be when you communicate and how the information be provided to them (Goudar, 2010). This early planning is crucial to avoid miscommunication later on.

Every project should include a communication management plan - a document that guides projects communications. This plan should be part of overall project plan. The type of communication will vary with the needs of the project (Goudar, 2010). Without such a plan, even a small team working together will have major problems. In the case of a virtual team, poor communication will render an already challenging situation nearly impossible to control (Goudar, 2010).

Effective communication is indeed one of the main elements of project management. Communication is a critical part between people, information, and ideas, and communication is the basis for project performance in organization (Samakova et al., 2018). This is why project managers spend at least 80-90% of their time communicating on projects (Samakova et al., 2018).

However, despite its importance, planning of project communication is an important process in the planning of the overall project. All stakeholders highlight about the importance and needs for project communication planning, but only



22% of them are concerned with these projects (Samakova et al., 2018). This lack of concern can lead to significant issues. Output of the planning of project communication process is the project communication management plan, which can be characterized as a tool for implementing the communication strategy of the project and answers the following questions: What information is needed for the realized project-the content of the communication, When information is needed-frequency, Who delivers information to anyone-responsibility and authority, How information will be delivered-methods, tools, and support resources (Samakova et al., 2018).

Without effective communication, each project is convicted to be a failure; therefore, it is necessary to deal with project communication constantly. The most effective way is to manage project communication from the very start of the project-initialization of project until its completion and administrative closure of project (Samakova et al., 2018).

Communication is seen as a critical success factor (CSF) in projects yet there are few empirical studies on this theme (Molena & Rovai, 2016). Communication connects individuals, constructs meanings, and establishes ways to act. It is a representation of a model of thought and a view of the world. To communicate is to act; communication is product and producer in social reality (Molena & Rovai, 2016). This underscores the importance of discussing the field of communication in management. Every organization, or every project, is composed of a community, a social grouping, which needs to be understood and share ideas and diverse situations. This is done through communication (Kunsch, 2003, p. 25) (Molena & Rovai, 2016). Authors stress the importance of the issue of problems of communication, which, in many cases, is pointed out as the reason for the failure of a project (Rabechini et al., 2011) (Molena & Rovai, 2016).

In summary, the lack of a comprehensive communication management plan can lead to numerous issues in project management. These include delays,

miscommunication, and a lack of stakeholder alignment. The importance of planning communication from the start and continuously managing it throughout the project cannot be overstated.

Breakdowns in communication are unacceptable reasons for project delays. A little planning up front is worth its weight in gold. Therefore, before starting up the project, the project management should plan communications. Plan is useful tool to ensure effective communication in the project (Culo & Skendrovic, 2010). This sentiment is echoed in the need for a detailed communication plan that answers critical questions such as Who do we need to communicate with? When do we communicate? How do we communicate? What needs to be communicated? How often do we communicate status? When do we meet as a team? When do we communicate with key stakeholders and in what fashion? What type of media should we use and when? For what purpose? Team communications, internal, external, leadership teams? (Culo & Skendrovic, 2010).

The analysis of communication requirements is also crucial. The analysis of the communication requirements determines the information needs of the project stakeholders. These requirements are defined by combining the type and format of information needed with an analysis of the value of that information. Project resources are expended only on communicating information that contributes to success, or where a lack of communication can lead to failure (Culo & Skendrovic, 2010). This ensures that communication efforts are focused and effective.

The obstacles that confront all the stakeholders of the project should be assessed before considering which vehicle to use for each communication item. The methods used to transfer information among project stakeholders can vary significantly. For example, a project team may use techniques from brief conversations all the way through to extended meetings or from simple written documents to material (e.g., schedules and databases) that is accessible online as methods of communication (Culo & Skendrovic, 2010).

This category lists the name of the team member responsible for ensuring the communication occurs. Whether it is actually initiating the communication or ensuring someone else does, this category establishes ownership of the communication and indicates specific people to hold responsible if the project suffers a delay due to a communication failure (Culo & Skendrovic, 2010). This accountability is essential for maintaining the integrity of the communication process.

The frequency of communication is another critical aspect. This category describes how often the specific communication will take place. When deciding this it has to be determined how often it is necessary to relay the information so that it is effective, without throwing the stakeholders into information overload (Culo & Skendrovic, 2010).

Interfaces may be constraints that limit project success. In this context interfaces are boundaries between different groups within an extended project team. Many project communication problems have, in fact, occurred at interfaces (Culo & Skendrovic, 2010). Addressing these interfaces is crucial for seamless communication.

The necessity of a well-planned communication strategy is evident. Communication Management needs to be planned during the beginning of the project. Communication Planning involves determining the information and communication needs of the stakeholders; Who needs what information and when, What type of information will they need and in what detail? What will your goal be when you communicate and how the information be provided to them (Goudar, 2010). This early planning is crucial to avoid miscommunication later on.

### **3. 3. 4 Measuring Communication Effectiveness**

Evaluating the efficacy of project communication is complex, as traditional metrics may not fully capture nuances like message clarity, stakeholder comprehension,

and the ability to drive desired actions, making robust measurement frameworks essential.

Therefore, the problem which is being addressed in the paper regards the lack of methods or procedures for evaluating communication effectiveness in project teams which would cover all important communication effectiveness aspects and be applicable for any project type and team (Muszynska, 2018). The main motivation for developing the concept of measuring communication effectiveness presented in this paper was the limitation of communication effectiveness aspects taken into account in previous studies or applicability only to specific project types (Muszynska, 2018). The complexity and challenges in measuring communication effectiveness are further underscored by the fact that the weakness of the proposed concept lies in the declarative character of the information provided by the respondents concerning their communication habits and behaviours. That is why future research could include some form of verification of the obtained declarations (Muszynska, 2018).

The importance of addressing this problem is highlighted by the statement that communication is undoubtedly one of the most important areas in project management, especially in distributed and multinational teams, what has been confirmed by numerous researchers and practitioners (Muszynska, 2018). However, to ensure effective project communication, it is, however, essential to determine what it means that communication is effective and establish ways of measuring effectiveness (Muszynska, 2018). The limited prior research in this area is pointed out that there have not been much research done in that field with probably the most significant study performed by the Construction Industry Institute which developed the Communication Project Assessment Tool (Compass) focused on measuring communication effectiveness in construction and engineering project teams (Muszynska, 2018).

A small-scale study described in the paper aimed to validate and present the usefulness of the concept for measuring communication effectiveness in project teams. It can be successfully applied to measure and analyse communication effectiveness of individual team members, the whole company/team and to compare the communication effectiveness among companies or teams (Muszynska, 2018). This further supports the need for and value of comprehensive communication effectiveness measurement frameworks.

The complexity of project communication is also emphasized by Damasiotis et al. (2012) when they say that communication management is among the most important knowledge areas in project management. Communication complexity sources that identified are project stakeholders' properties, project environment, project communication structure, communication properties, physical and psychological barriers. They further state that it is generally accepted that complexity in communication is present on every aspect of communication process (McChesney and Gallagher, 2004; Saunders and Stewart, 1990; Bergen, 1987). In order to achieve an effective communication management, it is important to control this complexity. However, to succeed that, communication complexity sources and measures should be determined (Damasiotis et al., 2012).

To address this, Damasiotis et al. (2012) propose that having located the communication complexity sources, the next step is to determine a set of measures for each complexity source to measure communication complexity. In our approach, our objective is to focus on measures that are mainly quantitative and can be measured at the beginning of the project. Our intention is to estimate the expected communication complexity and hence be able to take all the appropriate measures to control it. They highlight the impact of communication complexity on project failures by saying that recent researches show that software projects fail to meet their requirements in terms of time delay, cost overrun and quality restrictions. It is widely accepted that among the main reasons for these failures is

the increased complexity of modern software projects arising from their special characteristics in comparison with projects from other domains (Damasiotis et al., 2012).

The inadequacy of current methods to measure communication complexity is pointed out by saying that current studies measure software project complexity by measuring either the software project product based on its attributes such as size, quality, reliability or the characteristics of software project process using attributes such as performance, stability, improvement. According to our approach these methods are not adequate as they do not focus in the software project development management process (Damasiotis et al., 2012).

The effectiveness of communication depends on a set of social processes (Weick and Roberts, 1993 in deCarvalho 2013). In the context of projects, all the phases of the project life cycle, including the legacy of lessons learned, are involved. However, despite these guidelines, McChesneya and Gallagher (2004) suggest that communication in projects has been managed in an informal manner (de Carvalho, 2013). A key finding was that the case under study revealed an inconsistency: on the one hand, the importance of communication is exalted by all the analysed stakeholders, and on the other hand, the communication processes and practices proposed by the PMO and formalised in the company's PM methodology are neither followed nor prioritised by project managers (de Carvalho, 2013).

This gap between recognizing the importance of communication and actually following defined processes is further highlighted by saying that a lack of commitment to the company's PM methodology can be noted, particularly with regard to communication, because team members did not adhere to the standard processes, procedures and template documents developed for this area (Monteiro de Carvalho, 2013). Additional challenges arise from the lack of integration among research streams, which are disconnected from one another (de Carvalho, (2013) and the fact that in the organisational environment, barriers to communication

are easily detected and difficult to overcome (Kurland and Pelled, 2000). The complex nature of communication arises from many factors, such as semantics, power politics, and organisational and technological issues (Effy and Sosik, 2000; Gillard, 2005; McChesneya and Gallagher, 2004; DeBrabander and Edstrom, 1977; de Carvalho, M. (2013).

Project communication can be defined as the vehicle through which project stakeholders share information from different functional areas that is essential to the successful implementation of the project (Pinto and Pinto, 1990 in Samakova et al., 2013). This suggests that ensuring message clarity and comprehension across functional areas is challenging. They also found that according to the research results and comparing researches and case studies published in scholarly articles that project management communication can be considered as an important area within the project management. However, 66 % of industrial enterprises in Slovakia have not prepared any written document (methodology, process steps) to manage project communication (Samakova et al., 2013). This lack of formal methodologies makes measuring and ensuring communication effectiveness difficult.

In summary, authors strongly support the existence and importance of the problem of measuring communication effectiveness in project teams. They highlight the complexity of project communication arising from various sources, the lack of comprehensive measurement frameworks that capture the nuances of communication, the gap between recognizing the importance of communication and actually following defined processes, and the challenges in ensuring message clarity and comprehension across functional areas. The limited prior research, inadequacy of traditional metrics, and prevalence of informal communication management approaches make it difficult to effectively measure and evaluate communication.

### **3. 3. 5 Cross-cultural Misalignments**

Multicultural project environments require tailored communication approaches to bridge cultural gaps, build shared understanding between diverse teams/stakeholders, and prevent misinterpretations or conflicts arising from differences in norms and perspectives.

The complexity of managing multicultural project teams is evident in the challenges posed by cultural differences. As Ochieng and Price (2010) note, the problematic context of communicating in multicultural project teams raises questions as to how project managers and clients can go about overcoming the structural and cultural conditions and constraints which define its operation, in order that it can develop an infrastructure that facilitates more effective communication.

One significant issue is the loss of nonverbal communication cues in virtual settings. Ochieng and Price (2010) explain that for example, the loss of face-to-face communication can lead to misunderstanding and the loss of nonverbal signals such as eye contact and body language. This can subsequently lead to difficulty in achieving mutual trust and confidence within multicultural project teams.

Clear and consistent communication can help mitigate some of the problems associated with cultural differences. Ochieng and Price (2010) state that it was established that effective communication is the key to managing expectations, misconceptions, and misgivings on multicultural project teams.

Daim et al. (2012) also emphasize the impact of cultural differences on communication, noting that dispersed work groups in which members are located in different countries face unique cultural differences that can affect the overall success of the group's performance. Language barriers in differences in cultural expectations and understandings can have a profound impact on the group's overall performance.



Cultural differences can manifest in various ways, including functional, organizational, and national differences. Daim et al. (2012) explain that cultural differences that lead to communication issues tend to manifest themselves in three major categories: the functional disciplines of the members of the group, the organizational structure of the company and, the nationalities of the group members and/or the nation in which the groups exist.

The lack of verbal and nonverbal cues in virtual teams can hinder effective communication. Pitts, Wright, and Harkabus (2012) state that because they lack verbal and nonverbal cues which naturally exist in face-to-face teams, virtual teams are faced with unique obstacles toward effective communication (Martins et al., 2004). For example, compared to face-to-face teams, virtual teams demonstrate decreased social interaction, communication, and emotional expression (Järvenpää & Leidner, 1999).

The importance of clear lines of responsibility and robust issue resolution processes is highlighted by Ochieng and Price (2010), who note that participants in Kenya and the UK acknowledged that effective communication on projects is aided by the early establishment of clear lines of responsibility and clear robust issue resolution process within the integrated team.

Functional differences within teams can lead to varying knowledge bases and reasoning abilities. Daim et al. (2012) explain that functional differences, for example, can lead to group members with different knowledge bases, reasoning abilities, motivations, and like-minded thinking approaches.

The reduction or absence of social information in virtual teams can reduce the quality of communication. Pitts, Wright, and Harkabus (2012) state that according to media richness theory (Daft & Lengel, 1986), this reduction or absence of social information (compared to traditional face-to-face teams) ultimately reduces the quality of communication among virtual team members.

The study by Ochieng and Price (2010) also found that communication patterns varied between countries, therefore there is a need for project managers to be aware of and adapt to the various communication models in multicultural teams. They note that the study also found that communication patterns varied between the two countries. In Kenya, we established that data is contained in unequivocal codes, such as spoken or written words, whereas in the UK sending and receiving data is highly dependent upon the physical context and non-verbal communication.

National differences can align with intrinsic cultural influences, affecting communication. Daim et al. (2012) explain that national differences tend to align themselves with the intrinsic cultural influences of the nationalities of the persons within the group. Most nations prescribe either to an individualism or collectivism identity.

The lack of verbal and nonverbal cues in virtual teams can lead to reduced quality of communication. Pitts, Wright, and Harkabus (2012) state that consistent with media richness theory, empirical research investigating team functioning within virtual teams has shown that the lack of verbal and nonverbal cues in virtual teams results in reduced quality of communication, compared to traditional teams (Chidambaram, 1996; Martins et al., 2004), and subsequently hinders effective virtual team performance (Baltes, Dixon, Sherman, Bauer, & LaGanke, 2002).

Increased reliance on electronic communication can lead to misunderstandings in remote teams. Daim et al. (2012) note that in many cases geographically dispersed teams can present unique challenges to building effective interpersonal relationships between remote team members. Increased reliance on electronic communication can lead to misunderstandings, which can erode team communication and productivity, and inhibit the type of social interaction within a team that leads to innovation and success.

The extent of virtual communication has been shown to be negatively related to positive affect and affective commitment to the team. Pitts, Wright and Harkabus (2012) state that further extent of virtual communication has been shown to be negatively related to both positive affect and affective commitment to the team (Johnson et al., 2009). Taken together, these findings suggest that communication in virtual teams is more difficult than in traditional teams.

Cultural differences between geographic regions can negatively affect relationships in remote teams. Daim et al. (2012) explains that in remote teams, these problems can be exacerbated by cultural differences between geographic regions, and can negatively affect relationships between team members.

Effective communication is a critical element of team effectiveness in both traditional and virtual teams. Pitts, Wright, and Harkabus (2012) state that given evidence that effective communication is a critical element of team effectiveness, both in traditional and virtual teams (Furst, Blackburn, & Rosen, 1999; Mathieu, Maynard, Rapp, & Gilson, 2008; Järvenpää & Leidner, 1999), understanding drivers of communication quality in virtual teams is of great importance for 21st century organizations.

Trust, which was discussed in the context of the importance of trust in virtual teams, is not less important for the teams with inherently different social norms. Daim et al. (2012) note that research has indicated that one of the major reasons for the failure of GVTs is related to building trust. Trust is essential to any GVT and allows people to engage in risk-associated activities that they cannot control or monitor. These GVTs are not able to develop trust in the traditional method - where several factors such as common social norms, frequent social interactions, and shared experiences can facilitate the development of trust.

The anticipation of future association can promote trust and cooperation in teams. Daim et al. (2012) explains that another factor in promoting trust and cooperation

is the anticipation of future association. This type of anticipation is more common among co-located groups than in geographically dispersed groups. Co-location makes it easier to foster shared values, expectations, and social similarity, and increases the obligation to meet commitments.

Ochieng and Price (2010), Daim et al. (2012), and Pitts, Wright, and Harkabus (2012) provide extensive evidence of the challenges posed by cultural differences in communication and the need for tailored communication approaches to bridge cultural gaps and prevent misinterpretations or conflicts arising from differences in norms and perspectives in multicultural project environments.

### **3. 3. 6 Weak Interaction with Stakeholders**

Insufficient interaction and ineffective communication with project stakeholders, including customers defining requirements, can lead to misaligned expectations, lack of buy-in, and missed opportunities to incorporate valuable inputs, negatively impacting success.

Project stakeholder management is one of the focal parts of project management. Aligning the different objectives, interests, and expectations of stakeholders directly contributes to the success of the project (Turkulainen, Aaltonen, & Lohikoski, 2015). This alignment is crucial because the purpose of project stakeholder management is to enhance the project management team's understanding of the diverse stakeholders and their ability to make informed decisions about how to engage them in order to maintain their support and align their objectives (Turkulainen et al., 2015).

However, achieving effective communication with stakeholders is often challenging. Communication is an essential process in the world of project management. It is difficult to master, but essential to make a good effort in achieving. Often in troubled projects, project team members feel that if the communication had been better, the project would have run smoother. Therefore, communication is often

listed as one of the most needed areas for improvement (Culo & Skendrovic, 2010). This view is reflected in the need for regular communication, when in order to ensure the success of a project much information, including expectations, goals, needs, resources, status reports, budgets and purchase requests, needs to be communicated on a regular basis to all major stakeholders (Culo & Skendrovic, 2010).

Despite the efforts made to involve stakeholders and provide the necessary amount of information, there are cases of lack of involvement in projects: the results of the study by Nangoli et al (2016) indicate that some key project stakeholders are neither involved in the consultative meeting for the projects, nor in design of the project. This lack of involvement can have significant consequences, as the study findings showed that the level of stakeholder participation in health projects among NGOs (non-governmental organisations) in Uganda is still low. The authors emphasize that if stakeholders are not actively involved in the project by being consulted, taking up roles and making decisions concerning the health interventions which impact them; this is likely to negatively affect the sustainability of the project.

The complexity of project communication is further compounded by the temporary nature of many projects. Project communication can often be more difficult due to challenges unique to project management. Many projects are short-term, and therefore project communication is temporary. It is truly critical for project managers to get the message across right the first time to avoid failures in the communication process (Culo & Skendrovic, 2010). To mitigate these challenges, there should be also a clear and concise communication plan to address project responsibilities and the types of communication that will take place. It includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information (Culo & Skendrovic, 2010).

Failures in communication can have bad consequences. A failure in communication can negatively impact the project (Culo & Skendrovic, 2010). Effective communication strategies, such as interactive communication which involves two or more parties performing a multidirectional exchange of information and is the most efficient way to ensure a common understanding by all participants on specified topics (Culo & Skendrovic, 2010), are essential. Additionally, "push communication" and "pull communication" methods must be appropriately utilized to ensure that information reaches and is understood by the intended audience (Culo & Skendrovic, 2010).

The importance of planning communications cannot be overstated. Planning communications is the process of determining the project stakeholder information needs and defining a communication approach. The process responds to the information and communications needs of the project stakeholders; for example, who needs what information, when they will need it, how it will be given to them, and by whom (Culo & Skendrovic, 2010). Without proper planning, improper communication planning will lead to problems such as delay in message delivery, communication of sensitive information to the wrong audience, or lack of communication to some of the required stakeholders (Culo & Skendrovic, 2010).

Effective communication is not just about the right format and timing but also about overcoming obstacles. Effective communication means that the information is provided in the right format, at the right time, and with the right impact. Efficient communication means providing only the information that is needed (Culo & Skendrovic, 2010). However, the main communication obstacles (across interfaces listed above) can be boiled down to three broad ones: Political, Cultural, and Linguistic (Culo & Skendrovic, 2010).

In conclusion, every organization, or every project, is composed of a community, a social grouping, which needs to be understood and share ideas and diverse situations. This is done through communication (Molena & Rovai, 2016). The study by

Molena and Rovai (2016) identified several communication problems in projects, such as problems with data storing, or lack of it; problems of documents without all the information; technical problems with channels used for communication, such as e-mail, telephone, etc.; problems of trust between interlocutors; different languages; organizational culture; and others (Molena & Rovai, 2016). These issues underscore the critical role of communication in project management and the need for effective stakeholder engagement to ensure project success.

### **3. 3. 7 Lack of Communication Insights/Skills**

Many project managers lack deep insights into communication best practices, interpersonal skills, and techniques to effectively convey information, manage conversations, build rapport and shared understanding with diverse teams and stakeholders.

Overall, the project managers interviewed for the current project do not subscribe to the belief that communication is part of a constitutive dialogue. Instead, when discussing their overall views of communication, 82 percent of the interviewees took a transmission approach to the action. To that end, they believe that the goal of communication is to send clear, unambiguous and complete information (Ziek & Anderson, 2015). This perspective is further reinforced by the observation that much of this research focuses on the instrumental aspects of communication and not the way that it is used to develop and bring to end projects (Ziek & Anderson, 2015).

The literature suggests that the fundamental theme of the research is that communication is a competency that project managers can develop in order to succeed. However, most project management education either overlooks “soft” skills (i.e. communication) or teaches them separately from project management administration skills (i.e. budgeting, scope definition or creating the work breakdown structure (WBS)) (Ziek & Anderson, 2015). This gap in education is evident as

generally, the data revealed that project managers are not cognizant of the constitutive nature of communication. Project managers do not take into consideration that they are indeed designers nor that they are co-creators of a dialogue that ultimately crafts the trajectory of a project (Ziek & Anderson, 2015).

To address communication challenges, project managers rely heavily on the transmission model of communication. The transmission approach to communication is the most common in American culture and it is defined by the idea that the goal is to create messages that impart clear and concise information (Ziek & Anderson, 2015). This model assumes that the sender is responsible for making the information clear, unambiguous and complete so that the receiver can receive it correctly (Ziek & Anderson, 2015). However, the presumption in the transmission model that messages have a common interpretation across receivers is restrictive. Commitment to a transmission commits a practitioner to data collection and organization, sending the information to all appropriate stakeholders, with the intent of presenting a comprehensive, coherent message understood by all (Ziek & Anderson, 2015).

In addition to these challenges, typically, communication is viewed as either a competency that project managers require to be effective (Brill et al., 2006) or a factor for success and naturally, also the factor that leads to failure of projects and project management (Söderlund, 2011) (Ziek & Anderson, 2015). This view is limited as it does not consider the dynamic and interactive nature of communication.

Moreover, in addition to their temporary nature project teams are often geographically dispersed with teams involved in the design, management, procurement and construction functions in different locations. Furthermore, suppliers of key components are also often located in different countries or continents. This geographic dispersion can introduce its own problems (Livesey, 2016). The complexity of managing such dispersed teams is highlighted by the fact that projects are: unique, temporary, progressively developed and involve team members who



may come from different organisations, disciplines, cultures and remain together for a relatively short time. The authors suggest that the time element results in projects having a high degree of ambiguity, change, misunderstandings and miscommunications (Livesey, 2016).

The impact of geographic dispersion on communication is significant. Verburg, Bosch-Sijtsema and Vartiainen (2013) concluded that with geographically dispersed projects human factors were important. These factors included: Project management style and competence, Clarity of communication, Organisational support and the ability to develop trust (Livesey, 2016). Additionally, team members' diverse backgrounds (ethnic and experiential) and locations (e.g. concept design in Australia, detailed design in India, manufacturing in China, procurement run from Brisbane and a construction site in remote Australia) causes problems for team member management as a result of differences in: ... Team members' communication needs (Livesey, 2016).

The challenges of communication in project management are further compounded by the fact that the highest-ranking hard skill, development of a working control system, ranked thirteenth. When the twelve issues ranking higher than that of development of a working control system are considered, two out of the top three places were taken by problems relating to scope change with building a cohesive team being an equal second. Of the remaining nine issues, four relate to stakeholder management, four to team management and one to understanding the particular needs of a project (Livesey, 2016). These issues often arise from poor facilitation and communication skills of those charged with the stakeholder management. The deeper communication issue is poor skills in seeking the real "agenda" or needs of stakeholders. Professional background issues are prevalent when Clients are investing in a sector they aren't familiar with and don't listen to their advisors (Livesey, 2016).

The critical role of communication in project management is underscored by the assertion that the single most significant factor affecting the success of a project is the communication ability of the project manager (Zulch, 2014). Effective communication is essential as the success of communication mainly depends on the sender's ability to speak, write, reason and listen competently (Zulch, 2014). Feedback is also crucial, as Talukhaba, Mutunga and Miruka agree on the fundamental role of feedback in communication. Where feedback is absent, delayed or not soon forthcoming, interventions are required to enhance communication (Zulch, 2014).

The consequences of ineffective communication are severe. Ineffective communication can therefore also lead to misunderstanding in respect of construction projects. Inadequately defined tasks and critical processes, uncertainty regarding responsibilities, scope or objectives of construction projects may cause construction projects to fail (Zulch, 2014). Furthermore, poor communication during projects affects the schedule, the cost, the safety of workers and the project quality (Zulch, 2014). Therefore, the construction project manager has to communicate effectively regarding cost, time and quality as three of the four cornerstone factors on which the success of a project depends, followed by scope (Zulch, 2014).

The need for effective communication skills is evident as the construction project manager needs skills to communicate effectively with both the internal and external parties involved in the project (Zulch, 2014). Leadership is also a key component, as the project manager needs to be a leader to communicate effectively with all parties. The successful execution of a construction project depends heavily on the construction project manager's abilities as communicator to lead the team and manage a construction project successfully (Zulch, 2014).

In light of these challenges, effective responses to these growing challenges require project managers who are, first and foremost, competent communicators (Henderson, 2004). Researchers have identified the criticality of communication in various aspects of project management, including project feedback mechanisms

and channels, the listening and persuading behaviours of project leaders, the communication of project goals by project leaders, and the monitoring and feedback of project data (Henderson, 2004). However, the results of these and similar studies confirm the overall value of communication in managing projects, but contain little explicit information about how this value might operate through project managers (Henderson, 2004).

The findings from Henderson's study indicate that project managers can significantly influence a sense of shared satisfaction through their use of decoding. Examples here include paying attention to the perspectives and sources of information that diverse subject-matter-experts bring to cross-functional teams, responding quickly to messages from geographically dispersed members, being easy to talk to by all team members, demonstrating sensitivity to team members' needs of the moment, and being a good listener (Henderson, 2004). By developing and using their competency in written and verbal/nonverbal messages, project managers can positively influence their teams' productivity. Examples include providing clear feedback on project status, getting right to the point with overloaded project team members, being understandable to diverse technical experts, indicating the right information at the right time, and conveying the ability to deal with others effectively (Henderson, 2004).

### **3. 3. 8 Complexity of Communication**

As projects grow larger with more stakeholders involved, communication complexity increases exponentially, making it challenging to maintain clarity, consistency and timeliness of information exchange across all parties, including those defining project requirements.

According to Damasiotis, Fitsilis and O'Kane (2012), communication complexity sources that were identified are project stakeholders' properties, project environment, project communication structure, communication properties, physical and

psychological barriers This indicates that various factors contribute to the complexity of communication in projects. As the number of stakeholders and teams grows up, the communication complexity is increasing because communication planning and processes become more complex and more resources are needed to put on communication activities. This complexity is further exacerbated by the diversity of project teams. Different types of project teams enhance complexity as they have different knowledge bases, motivations, reasoning abilities and thinking approaches (Daim et al, 2011; Damasiotis, Fitsilis, & O'Kane, 2012). Additionally, geographical distribution of projects as well as with the globalization of labour market (Lu et al, 2005), leads to formation of teams with people from different nationalities and hence with differences in culture, ethic, habits, education, training to say few (Dekker et al, 2008; Hardin et al, 2007). These are critical factors in arising of attitudinal and psychological barriers between team members (Fox, 2001; Damasiotis, Fitsilis, & O'Kane, 2012).

In practice, in different types of projects, it is common that some troubles take place between the project participants during different project phases, which cause delays and conflicts. These issues can be caused by improper communication and incorrect exchanged messages (Taleb et al., 2017). This is supported by findings that reports revealed how the lack of communication could affect the project progression, where it was found that nearly 74% of the problems occurred in the project were caused by ineffective communication (Komi-Sirviö and Tihinen 2005; Taleb et al., 2017). Furthermore, Carvalho (2008) proved the absence of proper planning of project communication, which caused ineffective communication during the project (Taleb et al., 2017). Therefore, it is substantial for project managers to carefully pay attention to the communication management plan and give enough time to prepare it in the early stages of the project, otherwise, failed communication will cause project failure, insufficient outcomes and client dissatisfaction (Taleb et al., 2017).

Communication is of extreme importance in projects, though it is seen as one of the major problems. Communication is a fundamental indicator for a team to obtain high performance (Rabechini et al., 2011; Molena & Rovai, 2016). Various studies have highlighted the problems and needs for project communication management (PCM). Several authors have pointed out the problems of and need for PCM (Martins et al., 2012): whether in the project team or in relation to the business team (Carvalho and Mirandola, 2007); in achieving project objectives (Souza and Rodrigues, 2012; Yazici, 2009); as a CSF in local projects (Rabechini et al., 2011) and in global projects (Anantatmula and Thomas, 2010); in the installation of project offices (PMO) (Rodrigues et al., 2006); in the development of a collaborative, respectful and trusting relationship between team members and also with the project manager (Aaltonen and Sivonen, 2009; Carvalho and Rabechini, 2011; Karlsen, 2010); in project maturity (Carvalho and Mirandola, 2007; Silva and Luciano, 2010); in the identification of requirements (Coughlan et al., 2003; Saiedian and Dale, 2000); and others. (Molena & Rovai, 2016).

The complexity of communication is influenced by various factors. The complex nature of communication arises from many factors, such as semantics, power politics, and organisational and technological issues (Effy and Sosik, 2000; Gillard, 2005; McChesneya and Gallagher, 2004; DeBrabander and Edstrom, 1977; de Carvalho, 2013). Empirical studies have shown the relationship between communication and project success or failure. Empirical studies of project success have illustrated the relationships between communication and IT projects' success or failure (Johannessen and Olsen, 2011; Bartis and Mitev, 2008; Gillard, 2005; McChesneya and Gallagher, 2004; Bryde, 2003; Yeo, 2002; Effy and Sosik, 2000; Wateridge, 1995; McComb and Smith, 1991; Bostrom, 1989). (Monteiro de Carvalho, 2013). Johannessen and Olsen (2011) emphasise the importance of communication in projects, particularly those that are large and complex. They argue that companies should transition from the use of communication processes to the use of communication capabilities during projects (de Carvalho, 2013).

Barriers to communication are prevalent in organizational environments. Barriers to communication can be easily detected in the organisational environment, where problems with the centralisation of information and issues related to dubious interpretations are apparent. Nevertheless, it is difficult to overcome these barriers because even gossip can affect power in the workplace (Kurland and Pelled, 2000). (de Carvalho, 2013). A significant challenge is the semantic gap between different stakeholders. The semantic gap between IT personnel and other stakeholders is particularly relevant to this work. DeBrabander and Edstrom (1977) and DeBrabander and Thiers (1984) note that IT personnel utilise IT jargon, whereas users/managers use the semantics of management; thus, establishing semantic equivalence is an important step in systems development. The great challenge is to reconcile these distinctive views (Kirsch et al., 2002). (de Carvalho, 2013).

In a case study of a large commercial information service provider, the complexity of communication was evident. The studied company is a large, commercial information service provider with a focus on credit card processing. This organisation employs approximately 2,500 individuals and has annual billing of approximately R\$ 700 million. Approximately 15 per cent of the employees (379 employees) were involved in project activities, almost 50 per cent of whom were dedicated full-time work to project activities (de Carvalho, 2013). The company managed project stakeholders through continuous performance follow-up. The business units' PMOs manage project stakeholders based on continuous project performance follow-up. The primary document used for follow-up is the issue log book. Additionally, meetings are held in which stakeholders formally approve project deliverables and discuss the action plans for each issue in the log (de Carvalho, 2013). However, significant communication gaps were identified. When analysing Table VIII, one notes that the greatest communication gap is that involving client/users (Monteiro de Carvalho, 2013).

The case study revealed inconsistencies in communication practices. The case under study revealed an inconsistency: on the one hand, the importance of communication is exalted by all the analysed stakeholders, and on the other hand, the communication processes and practices proposed by the PMO and formalised in the company's PM methodology are neither followed nor prioritised by project managers). This highlights that the organisational level of the CIF demonstrates that the adoption of a standardized PM framework is not sufficient for the elimination of the barriers to communication. The results of the field research indicate that although the importance of communication was recognised, the company studied does not perform a significant amount of work on the processes involved in project communication. (de Carvalho, 2013).

### **3. 3. 9 Summary of Chapter 3.3**

As a result of studying specially selected literature for the research of the topic of problems in negotiations, an answer was formed to the first research question regarding the formation of a list of traditional communication problems.

This list includes the following problems: encoding/decoding competency gaps, virtual team breakdowns and virtual interaction challenges, inadequate communication planning, measuring communication effectiveness, cross-cultural misalignments, poor stakeholder engagement, lack of communication insights/skills, complexity of communication.

As projects grow larger with more stakeholders involved, communication complexity increases exponentially, making it challenging to maintain clarity, consistency and timeliness of information exchange across all parties, including those defining project requirements.

### **3. 4 Influence of the AI on Improving Communication Effectiveness**

AI as a tool of assistance for humans presumably is created to be useful for humans and might be also used in Project Management for project stakeholders, among them to customers and performers, as an impartial assistant with a greater stock of knowledge, than all participants could have combined. Such assistant for sure has the potential for support, which is extremely necessary when making complex multifactorial decisions.

Below is the available practice from the scientific literature studied, that describes the theory and practice of researchers and practitioners in decision-making using AI assistance within the framework of project activities where AI can try to help in finding the most appropriate solution.

#### **3. 4. 1 AI Influence on Encoding/Decoding Competency Gaps**

The issue of encoding/decoding competency gaps, when gaps in the ability to effectively encode messages for clear transmission and accurately decode received messages can lead to misunderstandings, misalignments and communication breakdowns between project teams, stakeholders and customers within project management is a significant one.

It is highlighted by Zwikael et al. (2023) who state that clearing knowledge barriers through knowledge sharing enhances communication capacity and improves project performance. They further emphasize the importance of understanding unique terminology in projects, stating that the use of unique terminology in AEC projects requires stakeholders to gain sufficient understanding of terminology, jargon and concepts.

This understanding is crucial as project managers of AEC projects should create a common communication language and help develop stakeholders' ability to understand unique project management terminology and concepts. However, the



authors also note that the results of the interviews show that both project managers and their stakeholders need to take action to improve their cross-communications.

In the context of AI, Joshi (2024) discusses the role of AI-powered chatbots in project stakeholder engagement. He states that chatbots, powered by sophisticated AI algorithms, can provide continuous support and interaction with project stakeholders. This is particularly vital in managing complex projects where continuous communication and prompt responses can significantly influence project success. Joshi further notes that AI-powered chatbots can provide personalized and efficient communication channels, fostering stronger and more meaningful engagement.

In addition, Joshi (2024) highlights the role of chatbots in enhancing stakeholder engagement, stating that chatbots, powered by AI, have emerged as a dynamic solution to enhance stakeholder engagement in project management. These automated conversational agents interact with stakeholders in a natural language format, providing real-time responses and personalized communication.

He also emphasizes the role of chatbots in streamlining communication, stating that chatbots streamline communication by automating responses to frequently asked questions, providing instant information to stakeholders. This automation reduces the burden on project managers, allowing them to focus on more complex tasks.

In the context of AI and project management, Ralf Muller et al. (2023) discuss the increasing rate of manuscripts about AI and projects being received by the Project Management Journal (PMJ). They state that Project Management Journal (PMJ) has been receiving manuscripts about AI and projects at an increasing rate and that empirically, the integration of AI into project management is a transformative trend that is reshaping the industry.

Muller et al (2023) also provide an overview of the current state of AI adoption. , they synthesized key findings from a comprehensive survey of 2,314 professionals across 129 countries, providing insights into the current state of AI adoption, AI's perceived impact on various project management areas, and the demographic distribution of AI knowledge and maturity levels within organizations

Joshi (2024) emphasizes the role of AI-powered chatbots in project stakeholder engagement. According to Joshi, chatbots enhance communication by offering stakeholders immediate, personalized responses, thereby reducing the likelihood of communication breakdowns. He also notes that chatbots are expected to continue advancing in their communication skills with customers, leading to more positive interactions.

This immediacy and personalization contribute to heightened stakeholder satisfaction, as stakeholders feel their concerns and queries are addressed promptly and effectively. Furthermore, Joshi (2024) highlights the transformative potential of these tools, noting that AI-powered chatbots hold substantial promise for revolutionizing stakeholder engagement in project management. While they present remarkable benefits in improving communication, stakeholder satisfaction, and project outcomes, there are challenges that need to be addressed. These include enhancing NLP capabilities and fine-tuning the interaction style of chatbots to suit diverse stakeholder groups.

### **3. 4. 2 AI Influence on Virtual Team Breakdowns and Virtual Interaction Challenges**

The issue of virtual team breakdowns and virtual interaction challenges, when remote and distributed project teams face unique communication hurdles like cultural differences, language barriers, technology constraints and lack of face-to-face interaction, which can hinder team cohesion, collaboration and performance.

Approaches in artificial intelligence, i.e., machine learning, offer methods to identify an algorithm based on behavioral and sensor data that is able to identify team flow and its dynamics over time without interrupting the process (Peifer et al., 2021). This suggests that AI can be leveraged to measure and promote team flow, which is crucial for team effectiveness, especially in virtual teams. In this article, we will thus present an approach to measure team flow in virtual teams using machine learning methods (Peifer et al., 2021).

Virtual teams face unique challenges that can hinder team cohesion and performance. The significant amount of time required to establish common conceptual frameworks and personal relationships can pose a significant constraint on collaboration in virtual teams). Moreover, the most commonly experienced problems correlating with socio-cultural distance are difficulties associated with diversity in language preferences, proficiency, and interpretation, which can create barriers for many projects. Even seemingly harmless jokes could have a massively detrimental impact on the success of a project if it is misunderstood as an insult due to cultural differences. (Morrison-Smith & Ruiz, 2020).

Technology constraints also pose challenges for virtual teams. Virtual teams face challenges related to leadership, such as nourishing an environment that fosters creativity and emergent leadership (Morrison-Smith & Ruiz, 2020).

Additionally, technology for remote work fails without adequate technical support or resources. Reliability is also an issue with communication technology—new technology must be stable enough to compete with the well-established reliability of the telephone (Morrison-Smith & Ruiz, 2020). Lack of face-to-face interaction further exacerbates these issues, as opportunities for informal interactions are greatly reduced by geographic distance between collaborators. As a result, remote collaborators are often excluded from spontaneous decisions that are made outside formal meetings (Morrison-Smith & Ruiz, 2020).

Overcoming communication challenges is crucial, as virtual teams are experiencing difficulties collaborating that are making it difficult for them to be as successful as co-located teams. Trust is more difficult to establish and maintain in geographically dispersed collaborations for a variety of reasons including the lack of strong relationships common to co-located teams, difficulties having in-depth personal interactions due to the absence of nonverbal cues and difficulties inferring the intentions of others (Morrison-Smith & Ruiz, 2020).

Interestingly, a machine learning system that identifies team flow can help not only to measure, but also to promote team flow and its dynamics over time. The machine learning system can be used as a decision support system, that can identify team processes as fostering or hindering for team flow and provide feedback if team processes deviate significantly from their optimal level. Furthermore, the implementation of artificial team management tools has the potential to provide more objective feedback, more objective decision criteria and more suitable interventions to the team. (Peifer et al., 2021)

Research shows that using algorithmic responses changes language and social relationships. More specifically, it increases communication speed, use of positive emotional language, and conversation partners evaluate each other as closer and more cooperative (Hohenstein et al., 2023).

However, consistent with common assumptions about the adverse effects of AI, people are evaluated more negatively if they are suspected to be using algorithmic responses (Hohenstein et al., 2023).

Even though perceived smart reply use is viewed negatively, actual smart reply use results in communicators being viewed as being more cooperative and affiliative. In other words, it seems that the negative perception of using AI to help us communicate does not match the reality. (Hohenstein et al., 2023).

Nonetheless, our research shows that generative AI, including a commercially-deployed AI system, can have a significant impact on how people communicate with both positive and negative consequences (Hohenstein et al., 2023).

### **3. 4. 3 AI Influence on Inadequate Communication Planning**

The issue of inadequate communication planning, when failure to develop a comprehensive communication management plan outlining strategies, channels, responsibilities and cadence can severely disrupt information flow, alignment and shared understanding among project stakeholders. This issue within project management can lead to difficulties for the project stakeholders to agree on a target solution. Stakeholder management would use ML, NLP, and NN to understand, classify, and analyze stakeholders; AI-assisted communication in projects using ML demonstrates the potential to improve team performance; In project work PD, the fuzzy expert system, SVM, NLP, DL, and NN can help with effective procurement management, appropriate communication with stakeholders, continuous learning, and the management of physical resources (Taboada et al., 2023). As stated by Wu et al. (2023) cited in Taboada et al. (2023), NLP is used to extract and exchange information and to support downstream applications.

AI's potential to improve the productivity and efficiency of PM processes in the B&E industry cannot be overlooked. As project managers spend the majority of their time in communication (Senaratne and Ruwanpura, 2016) and managing relationships (Wilkinson, 2001), it is crucial that tedious, recurring tasks can be automated so that project managers have more time to focus on the more critical tasks (Shang et al., 2023). Moreover, AI helps to ensure that the project progresses within the stipulated budget and schedule and identifies issues that require immediate intervention. Using a Delphi method, Holzmann et al.'s (2022) study identified the most important functions to be supported by AI are primarily schedule related, such as creating a project schedule, analyzing the implications of missing deadlines, creating a Work breakdown structure (WBS)/tasks list, updating project

progress and schedules, identifying scope creep and deviation and others (Shang et al., 2023).

AI improves business intelligence and performance (Selene and Gong, 2014). Existing research and popular press have documented the potential advantages of utilizing AI in organizations in improving productivity and streamlining organizational processes and tasks (Arslan et al., 2021). As part of an organization's ecosystem, AI can impact, particularly on performance, on the relationships between organizations and their customers, prospects and partners (Kelly et al., 2019; Rubin et al., 2010) (Wijayati et al., 2022). The results reveal that AI has a significant positive effect on employee performance and work engagement. Change leadership positively moderates the influence of AI on employee performance and work engagement. Change leadership is characterized by a leader's ability to improve existing systems by optimizing technology and maintaining good relationships with subordinates by motivating them (Wijayati et al., 2022).

Artificial intelligence predominantly incorporates the application of Data Science techniques to improve project processes. Broadly, Artificial Intelligence in project management can be summarized and categorized into the following four types which are dependent on context and process (Wang, 2019): integration and automation; chatbot assistance; machine-learning based; and autonomous management of projects (Ong & Uddin, 2020).

By considering the applications of Artificial Intelligence and Data Science within the delivery stage of projects, it is evident that a gamut of existing software is applicable and employed in process... Examples of current software incorporated into project management practice include Chatbots, Strategies, Zivebox, Rescoper, Clickup, Polydone as well as Clarizen (Munir, 2019). Other software cited comprise of Slack or JIRA (Schmelzer, 2019) (Ong & Uddin, 2020). Artificial Intelligence currently possesses an extensive range of applications in projects. These applications include processes to reduce risks, to assist in the daily tracking of

projects, to identify anomalies, outliers or correlations within projects. Robotic Process Automation is also an Artificial Intelligence application gradually gaining traction within the management of projects (Branscombe, 2018) (Ong & Uddin, 2020).

#### **3. 4. 4 AI Influence on Measuring Communication Effectiveness**

The issue of measuring communication effectiveness, when evaluating the efficacy of project communication is complex, as traditional metrics may not fully capture nuances like message clarity, stakeholder comprehension, and the ability to drive desired actions, making robust measurement frameworks essential.

The analytic procedures incorporated to facilitate the delivery of projects are often referred to as project analytics. Existing techniques focus on retrospective reporting and understanding the underlying relationships to make informed decisions. (Uddin, Ong, & Lu, 2022). However, effectively capturing the nuances of communication in this context can be challenging. Evaluating the efficacy of project communication is complex, as traditional metrics may not fully capture nuances like message clarity, stakeholder comprehension, and the ability to drive desired actions, making robust measurement frameworks essential. (Uddin, Ong, & Lu, 2022). This is where AI can potentially play a transformative role. The text mentions that AI can enhance processes such as communications and stakeholder management. (Holzmann, Zitter, & Peshkess, 2022). This suggests that AI can potentially improve the effectiveness of communication in project management by automating and optimizing various communication-related tasks. (Holzmann, Zitter, & Peshkess, 2022).

One way AI can achieve this is by addressing the challenges of stakeholder management. Managing stakeholder expectations involves challenging project management tasks and requires soft skills, such as emotional intelligence. (Fridgeirsson, Ingason, Jonasson, & Jonsdottir, 2021). AI can assist in this area by

helping to identify stakeholders, create stakeholder map, identify relevant and perceived, internal and external stakeholders in the project environment, their required and expected involvement, and their impact on project success. (Holzmann, Zitter, & Peshkess, 2022). Furthermore, AI can help to create and update contact list, including changes in team personnel, customers, vendors, and contractors, automatically changing meeting invitations and mailing lists to include the right lists and update them accordingly. (Holzmann, Zitter, & Peshkess, 2022).

Beyond stakeholder management, AI can also enhance communication within the broader context of project management. The text mentions that AI can help in planning meetings, summarizing meetings, and informing stakeholders. (Holzmann, Zitter, & Peshkess, 2022). For example, AI can be used to plan communication, meetings, set the meeting agenda based on work plan and current status and invite relevant stakeholders. (Holzmann, Zitter, & Peshkess, 2022). Similarly, AI can manage communication, summarize meetings, produce meeting minutes, including identification of decisions and actions items, and follow up on action items. (Holzmann, Zitter, & Peshkess, 2022). This can help to ensure that meetings are more productive and that key information is captured and disseminated effectively. Moreover, AI can manage communication, inform stakeholders, analyze communications to identify patterns and detect relevant stakeholders who should be notified on issues; send notifications and reports and messages to relevant stakeholders with relevant project information and/or action items where needed; identify how various stakeholders prefer communications. (Holzmann, Zitter, & Peshkess, 2022). This ability to tailor communication to the preferences of individual stakeholders can significantly improve the clarity and effectiveness of project communication.

In addition to improving communication processes, AI can also enhance the accuracy and timeliness of information sharing. It is clear that AI can monitor



schedules, adjust forecasts, and maintain baselines. (Fridgeirsson, Ingason, Jonasson, & Jonsdottir, 2021). This is critical because progress control, analyze and update progress and produce earned value assessments analyze integrated project data, update project plan, produce earned value analysis, estimate completion, and recommend corrective actions. (Holzmann, Zitter, & Peshkess, 2022). By providing stakeholders with access to real-time project data and analysis, AI can help to ensure that everyone is working from the same page and that decisions are made based on the most up-to-date information.

However, it's important to acknowledge that AI is not a silver bullet. AI will have less impact in knowledge areas and processes that require human leadership skills, such as developing and managing teams and the management of stakeholders. (Fridgeirsson, Ingason, Jonasson, & Jonsdottir, 2021). This is because according to the findings, AI will not perform tasks of project management that require human understanding, empathy and personal interactions. (Fridgeirsson, Ingason, Jonasson, & Jonsdottir, 2021). Therefore, the most effective approach is likely to involve a combination of AI-powered tools and human expertise. The project management profession can leverage AI by embracing the changes, working with the machines, and by nurturing the human skills and competences of the profession. (Fridgeirsson, Ingason, Jonasson, & Jonsdottir, 2021).

### **3. 4. 5 AI Influence on Cross-cultural Misalignments**

The issue of cross-cultural misalignments, when multicultural project environments require tailored communication approaches to bridge cultural gaps, build shared understanding between diverse teams/stakeholders, and prevent misinterpretations or conflicts arising from differences in norms and perspectives within project management, that can lead to difficulties or even the inability of the project customer and the project executor to agree between them, also, when applicable, while forming a target solution of the project. This cross-cultural communication challenge is acknowledged by researchers.

The present study investigates the prospective utilization of artificial intelligence in enhancing cross-cultural communication by means of translation (Khasawneh, 2023). Recognizing the importance of effective cross-cultural interactions, cultural Intelligence is a critical skill in today's globalized world, enabling individuals to navigate and communicate effectively across diverse cultures. It refers to the capability to understand, appreciate, and adapt to cultural differences, promoting meaningful interactions and minimizing misunderstandings (Shaohua & Wei, 2023). In this context, AI technology provides a solution to this issue by facilitating language exchanges and fostering intercultural dialogue (Karakas, 2023).

The research findings suggest that AI-based translation technology holds considerable promise in enabling cross-cultural communication, as per the perspectives shared by language experts and professional translators who were involved in the study (Khasawneh, 2023). Elaborating on cultural intelligence, cultural Intelligence is a term that encompasses an individual's ability to understand, interpret, and effectively interact with people from different cultural backgrounds. It involves not only recognizing and appreciating diverse cultural norms, values, and practices but also adapting one's behavior and communication style to bridge cultural gaps (Shaohua & Wei, 2023). Moreover, the benefits of AI will be covered in detail in this chapter, including how it may provide tailored feedback, enable adaptive learning, and help learners access to both native and non-native speakers of the target language (Karakas, 2023).

Nevertheless, the study participants also identified the limitations of the use of AI translation tool in tackling some challenges in cross-cultural communication (Khasawneh, 2023). At the same time, cultural Intelligence plays a vital role in cross-cultural communication by promoting sensitivity, understanding, effective communication, conflict resolution, global business success, empathy, respect, and personal growth (Shaohua & Wei, 2023). Complementing this view, AI

technology can contribute to lessening such misunderstandings by providing learners with context-specific information and explanations (Karakas, 2023).

Cultural Intelligence holds significant influence and offers valuable applications in the realm of cross-cultural communication. By understanding and appreciating cultural differences, individuals can facilitate smooth communication, mitigate conflicts and misunderstandings, enhance efficiency and quality, and promote successful outcomes in diverse cultural contexts (Shaohua & Wei, 2023). Furthermore, AI technology can help learners develop their cultural awareness with the exposure to a wide range of cultural artifacts, perspectives and practices (Karakas, 2023), thereby supporting cross-cultural understanding.

#### **3. 4. 6 AI Influence on Weak Interaction with Stakeholders**

The issue of weak interaction with stakeholders, when ineffective communication and inadequate engagement with project stakeholders, including customers defining requirements, can lead to misaligned expectations, lack of buy-in, and missed opportunities to incorporate valuable inputs, negatively impacting success.

Vocabulary can vary depending on each stakeholder's domain of expertise, and each group likely has its own goals, which can conflict with other groups' goals (Griffor et al., 2023). This communication barrier often exists in projects, which AI could potentially help bridge by translating between technical and non-technical language. Focus on the user. Explanations must be appropriate for each stakeholder population. Technical explanations should be reserved for only those groups who understand the language. Understanding is important for promoting end-user trust and adoption (Griffor et al., 2023). This emphasizes the need for tailored communication, a task AI could potentially assist with by generating customized reports and explanations for different stakeholder groups. The CPS framework can help bridge gaps by simplifying major aspects and concerns of systems into easily understandable components (Griffor et al., 2023). This suggests that AI,

integrated with frameworks like CPS, could facilitate clearer communication and shared understanding among stakeholders.

A company that wants to develop requirements for business processes for which artificial intelligence is used in business processes, also desires to remain transparent to applicants regarding the factors impacting their application, especially avoiding their decision-making process becoming a “black box”. To help ensure transparency, company requires that, upon completion of an application assessment, the applicant is sent a letter outlining the factors that went into deciding their application (Griffor et al., 2023). This illustrates how AI can be used to improve transparency and communication with stakeholders, potentially mitigating misunderstandings and fostering trust. The usage stage stakeholder group (Table 4) has the power and legitimacy in the deployment and usage of the AI system and its impacts on external stakeholders (Table 5) (Griffor et al., 2023). Although AI systems may impact individuals and society in life-and-death situations, project organizations or plans may ignore the concerns of the passive stakeholders (Griffor et al., 2023). This quote directly states that AI projects can negatively impact passive stakeholders if their concerns are ignored, relating to the inadequate engagement with project stakeholders part of the stated problem.

It employs stakeholder theory and a systematic literature review with thematic analysis to identify and classify individuals, groups, and organizations into six stakeholder project roles. It configures the stakeholder salience model with a harm attribute to identify passive stakeholders—individuals affected by AI systems but powerless to affect the project—and their nexus to the project (Griffor et al., 2023). This highlights how the paper identifies passive stakeholders impacted by but unable to influence AI projects, addressing the core issue of inadequate stakeholder engagement. The study contributes a novel method for identifying passive stakeholders and highlights the need to engage developers, operators, and representatives of passive stakeholders to achieve moral, ethical, and

sustainable development (Griffor et al., 2023). This quote explicitly states the need to engage passive stakeholders impacted by AI projects to achieve ethical development, directly relevant to the stated communication problem. Passive stakeholders may be affected by the project but do not actively contribute to the project outcome; they are usually engaged in projects through a form of representation (Griffor et al., 2023). This further clarifies the definition of passive stakeholders who are impacted by but cannot influence the project, requiring representation to be adequately engaged. The external stakeholders (Table 5) include the individuals and societal stakeholders who may be harmed during the development or operations of AI. [...] These passive stakeholders can be significantly impacted by the AI systems, although they have no power within the projects (Griffor et al., 2023).

These AI-driven communication tools enhance transparency, accountability, and engagement throughout the project lifecycle, improving overall project outcomes (Shamim, 2024). AI technologies such as chatbots and virtual assistants can facilitate stakeholder communication by providing real-time updates, answering queries, and facilitating collaboration among project team members (Shamim, 2024). Ensuring the privacy and security of project data is paramount, as AI systems rely on vast amounts of data to train algorithms and make predictions (Shamim, 2024).

AI projects need an inclusive stakeholder approach for moral, ethical, and sustainable system development and usage (Miller, 2022). The development stakeholders are the only group that can consider the concerns of all stakeholders (Miller, 2022). The project owner and manager can guide the project team to address the needs of all stakeholders, including passive stakeholders, by including representatives in the project, either as participants or as members of the governance committee (Miller, 2022). The stakeholder groups and project roles described in this study provide a baseline for verifying project stakeholders and delineates roles in the third and fourth steps (Miller, 2022). The project team makes decisions that

may impact the life and liberty of other persons and the environment (Miller, 2022).

While AI is seen as having huge potential to support interdisciplinary knowledge exchange, there may be deeper effects of using AI to further research policy and funders' agendas (Chubb et al., 2022). This quote suggests that using AI to align with research funders' agendas could negatively impact effective communication and engagement with other stakeholders like customers defining requirements. These may challenge traditional notions of a university and what it means to be an academic (Chubb and Watermeyer 2017; Clegg 2008; Harris 2005) which may or may not have “good” consequences (Chubb et al., 2022). This implies that the use of AI could challenge traditional academic roles and norms, potentially disrupting effective stakeholder communication processes. Nevertheless, the possibilities of AI present challenges which require deep reflection, reminiscent of related debates in research about academic productivity, metrics and algorithmic allocation (Arruda et al. 2016; Bonn and Pinxton 2020; Bornmann and Haunschild 2018; Dix et al. 2020; Wilsdon et al. 2015, 2017) (Chubb et al., 2022). This highlights that AI presents challenges reminiscent of debates around metrics and algorithmic allocation, which could negatively impact stakeholder interactions if not reflected upon deeply.

### **3. 4. 7 AI Influence on Lack of Communication Insights/Skills**

The issue of lack of communication insights/skills, when project managers lack a deep understanding of best communication practices, interpersonal communication skills and methods for effective information transfer, conversation management, and establishing mutual understanding with various teams and stakeholders.

AI-assisted communication in projects using ML demonstrates the potential to improve team performance (Taboada et al., 2023). In the realm of project

management, AI technologies such as chatbots and virtual assistants can facilitate stakeholder communication by providing real-time updates, answering queries, and facilitating collaboration among project team members (Shamim, 2024). This is particularly relevant given that many project managers lack deep insights into communication best practices, interpersonal skills, and techniques to effectively convey information, manage conversations, build rapport and shared understanding with diverse teams and stakeholders.

Cirule and Berzisa proposed a cost-effective AI-assisted chatbot framework for PM. The designed chatbot prototype was implemented using the Dialog flow Conversational platform, an agent for NLP, and in the following tool environments: Jira for project planning/tracking/management, Slack messaging platform for communication, Google Drive for project data storage, Google Calendar to schedule meetings, and Skype for users' communication. The proposed solution has the potential to save PM time and to reduce project failures (Taboada et al., 2023). This is crucial as lack of individual competencies and organizations struggling with different levels of competency and unclear responsibilities were identified as key challenges and risks (Zerfass et al., 2020).

The automation of requirements meetings and project quality management using DL, NN, and fuzzy bring the prospect of efficient project delivery (Taboada et al., 2023). Furthermore, AI-powered chatbots and virtual assistants can streamline communication, facilitate collaboration, and provide real-time updates to stakeholders, enhancing transparency and accountability throughout the project lifecycle (Shamim, 2024). This can mitigate the communication issues that often lead to difficulties or even the inability of the project customer and the project executor to agree between them.

Using AI techniques (e.g., ML, SVM, GA, fuzzy, and NN) to measure project performance indexes, assess delays and implement appropriate responses, and monitor activities, gives rise to precise project measurement (Taboada et al., 2023). This

precision is essential in addressing the traditional communication problem of lacking insights and skills. AI technologies mostly as an addition to professional activities, emphasizing its opportunities but also claiming that humans cannot be replaced or mimicked by technology (Foldes, 2018) (Zerfass et al., 2020).

AI-enabled uncertainty features address risk identification, probability distribution modeling, risk assessment, stability prediction, dispute risk forecasting, and project riskiness classification. AI techniques that improve for uncertainty functions include ML, fuzzy, ANN, ACO, and NLP (Taboada et al., 2023). This comprehensive approach to risk management can enhance the communication process by providing clear and actionable insights.

The results highlight the need for communication managers to educate themselves and their teams about the technology and to identify the implementation of AI as a leadership issue (Zerfass et al., 2020). This is echoed by the need for organizations to develop clear goals, align AI initiatives with business objectives, and invest in training and education to ensure successful implementation and adoption of AI-driven project management systems (Shamim, 2024).

Industry magazines and consultants already highlight a broad variety of possible AI applications in the field, ranging from analytics to targeting, from content creation to chatbots and from evaluation routines to strategy development and crisis management (Zerfass et al., 2020). These applications can significantly influence traditional communication problems by providing tools that enhance transparency, accountability, and engagement.

AI might not be able to mimic every asset of a human communicator but that does not free practitioners from becoming “master of the data” (Rosenberger and Niederhauser, 2018) (Zerfass et al., 2020). This sentiment underscores the importance of integrating AI to support communication efforts while recognizing the irreplaceable value of human skills.



These AI-driven communication tools enhance transparency, accountability, and engagement throughout the project lifecycle, improving overall project outcomes (Shamim, 2024). This improvement is vital in overcoming the communication barriers that project managers often face.

In summary, AI-assisted communication in projects using ML demonstrates the potential to improve team performance (Taboada et al., 2023). By leveraging AI technologies such as chatbots and virtual assistants, project managers can address the lack of communication insights and skills, thereby enhancing the overall effectiveness of project management.

#### **3. 4. 8 AI Influence on Complexity of Communication**

The complexity of communication in large-scale projects with multiple stakeholders presents significant challenges, however artificial intelligence offers promising solutions to address these issues. AI can help manage the vast amounts of information, mitigate communication breakdowns, and enhance stakeholder engagement in complex project environments.

Communication complexity in projects can be conceptualized to reflect the level/amount of distributed information required to solve a problem and communication challenges/difficulties during decision-making (Cakir et al., 2022). The multifaceted nature of communication in complex projects becomes apparent as the volume of information that must be shared and processed increases with project scale.

The correlation between project size and communication challenges is evident. Senescu et al. proposed that communication challenges increase along with the increase in project's product, organization, and process complexity (Cakir et al., 2022). Larger projects inherently involve more stakeholders, processes, and organizational structures, all contributing to the intricate communication landscape.

A key concern in complex project communication is the potential for message distortion. When the transmission chain between the sender and receiver of the communication gets longer, the chance of getting distortion also increases. The message distortion may induce misunderstandings, extra work, or even the possibility of conflicts between parties (Cakır et al., 2022). These communication breakdowns can lead to project inefficiencies and conflicts, highlighting the need for effective communication strategies.

The sheer volume of information in large projects presents a formidable challenge. Mega construction projects are more likely to experience communication problems due to the requirement of timely transfer of vast amount of information among many actors; hence, managing communication complexity appears to be a critical success factor (Cakır et al., 2022). As the number of project stakeholders grows, timely and accurate information sharing becomes increasingly difficult.

The diversity of stakeholders in complex projects further complicates the communication landscape. The large number of stakeholders in a project is a source of complexity because their interrelationships can lead to complex interactions, an inadequate understanding of the other stakeholders and conflicting stakeholder interests (Nguyen et al., 2021). This diversity can breed misunderstandings and conflicts if not properly managed.

Furthermore, AI can help bridge cultural and linguistic gaps in diverse project teams. Differences in culture, language, the vagueness of goals, or lack of proper management have been stressed by various authors as drivers of communication challenges (Cakır et al., 2022). AI-powered translation and cultural intelligence tools can facilitate better understanding and collaboration among team members from different backgrounds.

The traditional view of project communication as a simple transmission of information is increasingly being challenged. Overall, the project managers interviewed

for the current project do not subscribe to the belief that communication is part of a constitutive dialogue. Instead, when discussing their overall views of communication, 82 percent of the interviewees took a transmission approach to the action (Ziek & Anderson, 2015). This suggests that many project managers may not be fully leveraging the potential of communication as a tool for project management.

By leveraging AI in project communication, managers can move beyond the traditional transmission model of communication. As Ziek & Anderson (2015) suggest, communication is more than message exchange but a way that project managers generate the grounds for a project. AI can support this more nuanced approach by providing real-time insights, predictive analytics, and personalized communication strategies that adapt to the evolving needs of complex projects.

The critical role of communication in shaping project outcomes cannot be overstated. The way that the literature describes communication as a necessary skill for project managers and a factor for successful projects points to the notion that communication dictates the trajectory of a project (Ziek & Anderson, 2015).

In complex projects, stakeholder engagement becomes particularly challenging. In the context of CPs, engaging with all stakeholders, who have different attitudes and interests regarding the project, can be challenging (Nguyen et al., 2021). This challenge is compounded by the resources required to manage stakeholder relationships effectively. Time and money are required to overcome the challenges in dealing with stakeholders to satisfy their requirements and maintain the project's objectives and quality (Nguyen et al., 2021).

The consequences of poor communication in complex projects can be severe. Lack of communication among stakeholders and participants is one of the main reasons for the failure of CPs (Nguyen et al., 2021). This underscores the critical need for effective communication strategies in complex project environments.

The ongoing nature of communication challenges in complex projects is evident. A vast amount of information should be transferred between many parties at all times, which creates communication complexity and requires an effective communication process between the project team members (Cakır et al., 2022).

Clear communication in defining project parameters and expectations is crucial. The vagueness of the contract conditions may also induce conflicts since the expectations and roles of the parties are determined by the contract (Cakır et al., 2022).

Organizational culture plays a significant role in communication effectiveness. Rather than the cultural diversity in the project team, the differences in working methods (organizational culture) may also influence the knowledge sharing of the companies positively or negatively (Nguyen et al., 2021).

The interconnected nature of stakeholder relationships and decision-making in complex projects is apparent. Complex stakeholder relationships may also lead to CP evaluations, which involve multiple stakeholder groups, multiple objectives and a complex decision-making process (Nguyen et al., 2021).

Effective stakeholder engagement can help mitigate communication challenges. Engagement enables the communication system to address problems regarding lack of communication among stakeholders and participants (Nguyen et al., 2021).

Complex projects may require specialized communication approaches to deal with unfamiliar or crisis situations. In the context of CPs, a crisis communication structure can be adapted to deal with unfamiliar situations that require an immediate and effective response (Nguyen et al., 2021).

Communication technologies and developing a plan/system of communication can be used to facilitate communication. Indeed ... some of the interviewees mentioned special software and tools such as cultural management plans and

communication matrices as critical success factors (Cakir et al., 2022). AI-powered communication tools can streamline information sharing and help project managers maintain clarity and consistency across large teams.

AI can also assist in managing stakeholder relationships. SE plays a critical role in managing projects, and it contributes to improved PP. However, in CPs, lack of communication among stakeholders has been identified as one of the main reasons for project failure (Nguyen et al., 2021). AI-driven stakeholder analysis and engagement tools can help project managers identify key stakeholders, track their interests, and tailor communication strategies accordingly.

### **3. 4. 9 Summary of Chapter 3.4**

The studied literature highlights several ways in which AI can address traditional communication problems in project management. The influence of artificial intelligence on traditional communication issues in project management is multifaceted and far-reaching. By addressing various challenges, AI technologies are transforming how project teams communicate, collaborate, and deliver results.

In the field of encoding and decoding competency gaps, AI technologies offer solutions to enhance understanding and bridge knowledge barriers. These tools provide context-specific information and explanations, helping to mitigate misunderstandings in complex project environments. As Zwikael et al. (2023) note, clearing knowledge barriers through knowledge sharing enhances communication capacity and improves project performance.

Virtual team breakdowns and interaction challenges are being addressed through AI-powered systems that facilitate collaboration and measure team dynamics. These tools are particularly valuable in remote work settings where traditional face-to-face interactions are limited. Peifer et al. (2021) highlight this potential, stating that a machine learning system that identifies team flow can help not only to measure, but also to promote team flow and its dynamics over time.

Inadequate communication planning can be mitigated through AI-assisted tools that automate and optimize various aspects of project communication. These systems help project managers develop comprehensive communication strategies and execute them effectively. As Taboada et al. (2023) point out, AI-assisted communication in projects using ML demonstrates the potential to improve team performance.

Measuring communication effectiveness is enhanced through AI's ability to provide real-time insights and predictive analytics. These capabilities allow project managers to go beyond traditional metrics and capture nuanced aspects of communication. Holzmann, Zitter, & Peshkess (2022) note that AI can analyze communications to identify patterns and detect relevant stakeholders who should be notified on issues.

Cross-cultural misalignments are being addressed through AI-powered translation and cultural intelligence tools. These technologies facilitate better understanding and collaboration among diverse team members. Khasawneh (2023) affirms this potential, stating that the research findings suggest that AI-based translation technology holds considerable promise in enabling cross-cultural communication.

Weak interaction with stakeholders is improved through AI systems that enhance stakeholder engagement and tailor communication strategies. These tools help project managers identify and address the needs of all stakeholders, including those who may be passive or overlooked. Miller (2022) emphasizes this point, noting that the project owner and manager can guide the project team to address the needs of all stakeholders, including passive stakeholders, by including representatives in the project.

The lack of communication insights and skills among project managers is being addressed through AI tools that automate routine tasks and provide data-driven insights. This allows managers to focus on developing critical communication skills.

Shamim (2024) highlights this benefit, stating that AI-powered chatbots and virtual assistants can streamline communication, facilitate collaboration, and provide real-time updates to stakeholders, enhancing transparency and accountability throughout the project lifecycle.

Finally, the complexity of communication in large-scale projects is being managed through AI systems that help process vast amounts of information and facilitate clear, consistent messaging across diverse stakeholder groups. Cakır et al. (2022) underscores this challenge, noting that mega construction projects are more likely to experience communication problems due to the requirement of timely transfer of vast amount of information among many actors.

## **4. RESULTS AND DISCUSSION**

This research aimed to explore traditional communication issues in project management and examine how AI can potentially influence these issues. The research was guided by two main questions:

What traditional communication issues arise when forming a target solution within the framework of a project?

How can artificial intelligence influence traditional communication issues that arise in the process of forming a target solution within the framework of a project?

Through a comprehensive literature review and analysis, several key communication challenges in project management were identified and explored the potential of AI to address these issues.

### **4.1 Traditional Communication Issues in Project Management**

This study has identified several critical communication issues that consistently arise in project management.

The findings highlight the significant impact of encoding and decoding skills on project team productivity and satisfaction. As Henderson (2004, 2008) demonstrated, project managers' encoding skills alone can explain 21% of the variance in team productivity. This underscores the critical need for project managers to develop strong communication competencies, particularly in constructing clear messages (encoding) and accurately interpreting received messages (decoding).

The persistence of these competency gaps suggests that current project management training and education may not adequately address these crucial skills. This aligns with Ziek & Anderson's (2015) observation that many project managers take a transmission approach to communication rather than viewing it as a constitutive dialogue.



The increasing prevalence of virtual teams has introduced new communication challenges, including cultural differences, language barriers, and the lack of face-to-face interaction. Research findings, supported by studies such as Daim et al. (2012) and Pitts et al. (2012), indicate that these factors can significantly reduce communication quality and hinder team cohesion.

The absence of non-verbal cues in virtual settings, as highlighted by Pitts et al. (2012), appears to be a particularly critical factor. This suggests that project managers need to develop new strategies to compensate for the loss of these important communication channels in virtual environments.

The conducted research has also revealed a concerning trend of inadequate communication planning in projects. The finding that only 22% of stakeholders are concerned with communication planning (Samakova et al., 2018) is particularly alarming. This lack of attention to communication planning can lead to information flow disruptions, misalignments, and a lack of shared understanding among project stakeholders.

The importance of a comprehensive communication management plan, as emphasized by Culo & Skendrovic (2010) and Goudar (2010), cannot be overstated. The result of research suggests that many projects may be undermined by a failure to prioritize this crucial aspect of project management.

The challenge of effectively measuring communication in projects emerged as a significant issue. Traditional metrics often fail to capture nuances such as message clarity and stakeholder comprehension. This aligns with Muszynska's (2018) call for more robust measurement methods and Damasiotis et al.'s (2012) emphasis on the need to control communication complexity.

The lack of effective measurement tools may be contributing to a cycle where communication issues are not properly identified and addressed, leading to persistent problems in project execution.

In an increasingly globalized project environment, cross-cultural communication challenges have become more prominent. Findings, supported by studies like Ochieng & Price (2010) and Daim et al. (2012), highlight the need for tailored communication approaches to bridge cultural gaps and prevent misinterpretations.

The persistence of these issues suggests that current approaches to managing cross-cultural communication in projects may be insufficient, pointing to a need for more culturally intelligent communication strategies.

This study showed that ineffective communication and inadequate engagement with project stakeholders remain significant issues. This aligns with findings from Turkulainen et al. (2015) and Nangoli et al. (2016), who emphasize the importance of regular stakeholder communication and the potential negative impacts of low stakeholder participation.

The persistence of these issues suggests that many projects may be missing opportunities to incorporate valuable stakeholder inputs, potentially leading to misaligned expectations and reduced project success.

This research shows that many project managers lack deep insights into communication best practices, interpersonal skills, and techniques to effectively convey information, manage conversations, build rapport, and shared understanding with diverse teams and stakeholders. This aligns with findings from Ziek & Anderson (2015), who highlight that many project managers take a transmission approach to communication rather than viewing it as a constitutive dialogue. Henderson (2004) emphasizes the importance of developing communication competencies, while Zulch (2014) discusses the critical role of communication skills in project management. The persistence of these issues suggests that there is a significant gap in communication skills training and development for project managers.

As projects grow larger and involve more stakeholders, the complexity of communication increases exponentially. These findings, supported by studies such as

Damasiotis et al. (2012) and Monteiro de Carvalho (2013), highlight the challenges in maintaining clarity, consistency, and timeliness of information exchange in complex project environments.

This growing complexity suggests that traditional communication approaches may be insufficient for modern, large-scale projects, pointing to a need for more sophisticated communication management strategies.

#### **4.2 Influence of AI on Communication Issues**

The study has identified several ways in which AI could potentially address the traditional communication issues in project management.

AI technologies show promise in helping to bridge knowledge barriers and enhance understanding between project stakeholders. As suggested by Cakir et al. (2022) and Nguyen et al. (2021), AI-powered chatbots and other tools can provide continuous support and personalized communication channels, potentially mitigating some of the encoding/decoding challenges identified in this research.

AI tools also have the potential to improve communication in virtual teams by enhancing team dynamics and interaction. Research findings, supported by studies like Peifer et al. (2021) and Morrison-Smith & Ruiz (2020), suggest that AI can help improve communication speed, promote the use of positive emotional language, and increase the perception of closeness among team members.

Furthermore, AI shows promise in automating tasks related to communication planning and improving business intelligence in project communication. As highlighted by Cakir et al. (2022) and Nguyen et al. (2021), AI can assist with stakeholder management, communication analysis, and procurement management, potentially addressing some of the planning inadequacies identified in this research.

AI's capability to provide real-time insights and predictive analytics could significantly improve the measurement of communication effectiveness in projects. As suggested by Uddin et al. (2022) and Holzmann et al. (2022), AI can help project managers capture more nuanced aspects of communication and identify patterns that might be missed by traditional metrics.

AI-based translation technology and cultural intelligence tools show potential in enabling more effective cross-cultural communication. The study results confirmed by researches like Khasawneh (2023) and Shaohua & Wei (2023), suggesting that AI can help bridge cultural gaps and reduce misunderstandings in multicultural project environments.

AI-powered tools such as chatbots and virtual assistants show promise in improving stakeholder engagement and communication. As highlighted by Griffor et al. (2023) and Miller (2022), these tools can help bridge communication gaps between technical and non-technical stakeholders and provide real-time updates, potentially addressing some of the stakeholder interaction issues identified in the research.

AI shows potential in enhancing project managers' communication skills and providing data-driven insights to improve communication strategies. Research results show that AI can help in personalizing communication and automating routine tasks, allowing project managers to focus on developing critical communication skills. As highlighted by Taboada et al. (2023) and Shamim (2024), AI-powered tools can analyse communication patterns and provide feedback on tone, clarity, and effectiveness. These tools can offer real-time suggestions for improving message content and delivery, potentially addressing the lack of communication insights identified in traditional project management practices.

AI's ability to process vast amounts of information and facilitate clear, consistent messaging across diverse stakeholder groups could help manage the increasing

complexity of project communication. Research findings, supported by studies like Cakir et al. (2022) and Nguyen et al. (2021), suggest that AI-driven stakeholder analysis and engagement tools could help project managers navigate the complexities of large-scale project communication.

## 5. CONCLUSIONS

### 5.1 Theoretical Contribution

Research Question 1: What traditional communication issues arise when forming a target solution within the framework of a project?

Various communication problems that arise in the process of working on the project were identified, such as Encoding/Decoding Competency Gaps, Virtual Team Breakdowns and Virtual Interaction Challenges, Inadequate Communication Planning, Measuring Communication Effectiveness, Cross-Cultural Misalignments, Weak Interaction with Stakeholders, Lack of communication insights/skills, Complexity of Communication. Each of these problems is associated with certain difficulties in project communication.

The lack of encoding/decoding knowledge shows that team members can interpret messages differently, which can lead to potential misunderstandings. As stated by Henderson (2004), ability to effectively encode and decode messages is crucial for the success of the project results show a significant communication-performance relationship. Specifically, project managers' competency in decoding and encoding are significantly associated with team member satisfaction, while project managers' encoding is significantly associated with project team productivity.

Breakdowns in the work of the virtual team and problems with virtual interaction emphasize the need for effective tools and strategies for digital communication in a remote work environment. Inadequate communication planning highlights the importance of establishing clear protocols from the very beginning of the project to ensure a smooth flow of information. As Culo & Skendrovic (2010) state, inadequate communication planning can severely disrupt information flow, alignment, and shared understanding among project stakeholders. To ensure the success of a project, much information, including expectations, goals, needs, resources,

status reports, budgets, and purchase requests, needs to be communicated on a regular basis to all major stakeholders. Project communication can often be more difficult due to challenges unique to project management. Many projects are short-term, and therefore project communication is temporary. It is truly critical for project managers to get the message across right the first time to avoid failures in the communication process.

Measuring communication effectiveness is proving to be a difficult task, as it is often difficult to quantify the impact of communication efforts on project outcomes (Muszynska, 2018, Damasiotis et al., 2012; Monteiro de Carvalho, 2013).

Cross-cultural misalignments emphasize the urgent need to understand cultural differences and adapt when working with different teams. The weak interaction with stakeholders highlights the need to maintain close engagement with all involved parties to align the goals and expectations of the project (Ochieng and Price (2010); Daim et al. (2012); Pitts, Wright, and Harkabus (2012).

The lack of communication insights/skills suggests that additional training may be useful for team members to improve their communication skills. Finally, the complexity of communication confirms the multifaceted nature of the interaction within the project, emphasizing the need for a subtle approach to the effective management of various communication channels and styles. As noted by Ziek & Anderson (2015), the literature suggests that the fundamental theme of the research is that communication is a competency that project managers can develop in order to succeed. However, most project management education includes either overlooks “soft” skills (i.e. communication) or teaches them separately from project management administration skills (i.e. budgeting, scope definition or creating the work breakdown structure (WBS)).

Research Question 2: How can artificial intelligence influence traditional communication issues that arise in the process of forming a target solution within the framework of a project?

Several ways have been identified by which artificial intelligence can solve identified problems.

To address competency gaps in coding/decoding, artificial intelligence technologies can improve understanding by providing context-specific information and explanations, and thereby eliminating misunderstandings. Joshi (2024) discusses the role of AI-powered chatbots in project stakeholder engagement. He states that chatbots, powered by sophisticated AI algorithms, can provide continuous support and interaction with project stakeholders. This is particularly vital in managing complex projects where continuous communication and prompt responses can significantly influence project success. Joshi further notes that AI-powered chatbots can provide personalized and efficient communication channels, fostering stronger and more meaningful engagement.

In case of breakdowns in the work of the virtual team and challenges with virtual interaction, artificial intelligence-based systems can facilitate collaboration and measure team dynamics, which is especially valuable in remote work conditions (Peifer et al., 2021). Similarly, in an environment of inadequate communication planning, AI-enabled tools can automate and optimize various aspects of project communication, helping managers develop comprehensive strategies (Taboada et al., 2023). When it comes to measuring communication effectiveness, real-time artificial intelligence analytical capabilities and predictive analytics allow managers to capture communication nuances beyond traditional metrics (Holzmann, Zitter, & Peshkess, 2022). To eliminate cross-cultural misalignments, artificial intelligence-based translation and cultural analytics tools promote better understanding and collaboration between different team members (Khasawneh, 2023). When the interaction with stakeholders is weak, artificial intelligence systems can



enhance stakeholder engagement by adapting communication strategies to meet the needs of all stakeholders, including those who may be passive or unnoticed (Shamim, 2024). Regarding the lack of communication insights/skills, artificial intelligence tools can automate routine tasks and provide data-based information, allowing managers to focus on developing critical communication skills (Taboada et al., 2023). To reduce the impact of communication complexity, artificial intelligence can process huge amounts of information and ensure clear and consistent messaging between different stakeholder groups, helping to manage the growing complexity of project communication (Livesey, 2016).

## **5.2 Recommendations, Limitations and Future Research**

Based on the findings of this study, several recommendations can be made to improve communication in project management and leverage the potential of AI:

Project managers should receive training focused on developing their encoding and decoding skills. This includes constructing clear messages and accurately interpreting received messages to reduce misunderstandings and improve team productivity and satisfaction.

Training programs should include modules on cross-cultural communication to help project managers navigate cultural differences and prevent misinterpretations in multicultural project environments.

Organizations should prioritize the development of detailed communication management plans that outline strategies, channels, responsibilities, and communication cadence. This will help ensure alignment and shared understanding among project stakeholders.

Communication plans should address the specific information needs of all stakeholders, ensuring timely and appropriate information flow.

Project managers should consider incorporating AI-powered tools such as chatbots, virtual assistants, and translation technologies to enhance communication efficiency and effectiveness. These tools can help bridge knowledge barriers, improve virtual team dynamics, and provide real-time updates to stakeholders.

AI can assist in automating tasks related to communication planning and provide real-time insights and predictive analytics to measure communication effectiveness. This can help project managers capture nuanced aspects of communication and identify patterns that might be missed by traditional metrics.

Organizations should invest in developing cultural intelligence among project teams. This includes training on cultural awareness, sensitivity, and the use of AI tools to support cross-cultural communication.

Project managers should adopt tailored communication approaches that consider the cultural backgrounds of team members and stakeholders to build shared understanding and prevent conflicts.

There is a need for more sophisticated frameworks to evaluate communication effectiveness in projects. These frameworks should leverage AI for real-time insights and predictive analytics, providing a more comprehensive assessment of communication quality.

### **5.3 Limitations and Future Research**

While this study provides valuable insights into project communication issues and the potential of AI, it has several limitations that point to areas for future research.

The findings of this study are primarily based on a literature review. While this provides a broad understanding of the issues and potential solutions, empirical validation is needed to confirm the effectiveness of AI in addressing the identified communication challenges.

The study focuses on the potential of AI in project communication but does not explore the full range of AI applications in project management. Future research could expand on this to provide a more comprehensive understanding of AI's role in project management.

The findings may not be generalizable to all industries and project types. Different industries and projects may face unique communication challenges and may benefit from different AI solutions.

Future studies should empirically validate the effectiveness of AI in addressing the identified communication issues. This could involve case studies, experiments, or surveys to gather data on the impact of AI tools in real-world project settings. Research is also needed to understand the long-term impact of AI on project communication. This includes studying any potential drawbacks or unintended consequences of using AI in project communication. In addition, future studies could explore how communication issues and AI solutions vary across different industries and project types. This would provide more tailored recommendations for specific contexts.

More research is needed on how project managers and team members interact with AI communication tools. Understanding the dynamics of human-AI interaction can help optimize the use of AI in project communication. Furthermore, future research should address the ethical implications of using AI in project communication. This includes issues of privacy, data security, and potential biases in AI algorithms. Ensuring ethical use of AI is crucial for maintaining trust and integrity in project management.

This study has identified significant communication challenges in project management and explored the potential of AI to address these issues. While AI shows promise in enhancing various aspects of project communication, it is clear that it

cannot fully replace human communication skills and should be viewed as a complementary tool rather than a complete solution.

The findings underscore the need for a balanced approach that combines AI capabilities with human expertise to achieve optimal project communication outcomes. As project environments continue to grow in complexity and global reach, the effective integration of AI into project communication strategies may become increasingly crucial for project success.

By addressing the identified communication challenges and leveraging the potential of AI, project managers can work towards more effective, efficient, and successful project outcomes. However, this will require ongoing research, practical experimentation, and a commitment to developing both human communication skills and AI-enhanced communication strategies in tandem.

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