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# Importance of Effective Communication to Minimize Disputes in Construction Projects

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**Abstract** | **Original Research Article**

Disputes are inevitable in construction projects. There are different causes for these disputes which require more time, cost, and effort of project teams to find resolutions. Therefore, disputes impact negatively on project performance which can result in unsuccessful project completion. Poor communication between the teams is one of the causes of disputes. Therefore, by identifying the factors that affect communication effectiveness, project leaders can manage project communication effectively with well-defined information distribution methods. The purpose of this study was to emphasize the importance of effective communication to minimize disputes in construction projects. The objective was to identify the factors that improve the project team's communication. Existing publications from 2019 to 2022 were studied as secondary resources for this study. This study revealed five factors that affect effective communication between the teams for a construction project together with research gaps and future research areas.

**Keywords:** Construction disputes, project communication, causes of disputes, communication effectiveness.



## INTRODUCTION

The construction industry is one of the important sectors of the economy of any nation. The Chartered Institute of Buildings (CIOB) identifies the construction industry as a sector that has an impact on every member of society. The construction industry affects productivity of every member of society at their home and their work (CIOB, n.d.). As a diversified industry, construction projects comprise numerous parties including developers, suppliers, consultants, and contractors. Several teams and experts work together to complete a construction project in a dynamic and complex environment surrounded by a high level of risk and uncertainties. The project team has to deal with the construction environment including site conditions, geography, communities, and existing infrastructure while satisfying various stakeholder requirements (Ayhan, 2019).

Different parties to a construction project have different goals to achieve. While the primary goal of a client is to achieve the maximum quality and functionality of the constructed product for a minimum cost, the contractor expects to achieve financial goals together with client satisfaction (Ayhan, 2019). Due to the nature of construction projects, disputes are common and these arise due to different reasons.

Most of the construction disputes are due to disagreements between the contract parties (El-Sayegh *et al.*, 2020). Among the different causes of disputes, contractual issues impact greater and studies have shown that most disputes due to contractual matters could have been avoided (Lee *et al*., 2021). Further, it is essential to clearly express the conditions in contract documents to prevent misinterpretation. According to Gamil & Rahman (2017), poor communication among the parties is another major cause of disputes in construction projects. They even identified lack of communication as the most important factor that causes disputes in the construction sector (Gamil & Rahman, 2017). Project delay due to poor communication can be due to improper communication channels, wrong interpretation, slow information flow, and wrong design. Poor communication can also impact material delivery causing defects and performance issues. This can cause disputes (Gamil & Rahman, 2017). Therefore, it is essential to improve communication effectiveness to improve the relationship between the project teams (Gamil & Rahman, 2017).

In a study conducted to find the sources of conflicts and disputes in construction projects, Soni *et al*., (2017) identify lack of communication as one of the third party factors which relate to human behavior. However, behavior related factors are controllable. They suggest practicing better communication among participants to minimize the disputes and their effects (Soni *et al*., 2017).

Considering all these existing facts, this paper discusses the importance of effective communication to minimize disputes in construction projects. Further, the objective of this study is to identify the factors that improve the project teams' communication.

**Purpose**

The purpose of this study is to emphasize the importance of effective communication between parties to the contract to minimize possible disputes in construction projects. With that purpose, the objective of this research is to study the factors which could identify the effectiveness of communication between project teams to prevent disputes, which is a success factor in project completion. By identifying these factors that affect effective communication, the author expects this research will be a guideline to minimize or mitigate potential disputes that arise during construction project performance.

**Problem and Hypothesis**

As mentioned above, the main problem this study focuses on is finding the factors that improve communication between project teams that minimize construction project disputes. However, this study didn't focus on any country or any specific geographical area. Instead of that, the author assumed that effective communication is equally important for any construction project across the globe as a success factor to minimize disputes.

## THEORETICAL BACKGROUND

**Construction Disputes and impact on project performance**

Disputes are inevitable in construction projects. Most of the time, the planned conditions and actual site conditions are different and this can create a base for arguments and disagreements. Finally, these arguments and disagreements can lead to complex dispute situations. The nature of construction disputes can be varied and these can be technical-related, financial, duration, or even quality-related (Surahyo, 2018). After all, disputes can lead the team to complete unsuccessful projects. Among the factors that prevent the successful completion of a construction project, disputes appear as one of the major factors (Duchaussoy, 2019). Other than unsuccessful project completion, disputes can also impact the relationship of the parties involved. In most cases, finding a resolution for disputes requires more effort, time, and money (Durand, 2019).

Therefore, dispute prevention is important for any project to achieve its goals where it can begin at an early stage of a construction project (Francis & Ramachandra, 2022).

**Common Causes of Construction Disputes**

There are many groups connected to a construction project due to the nature of project implementation. These groups include people from various backgrounds and they work together in teams sharing their talent and knowledge to achieve project goals. On the other hand, people who work in a highly complex construction project environment have their own project goals. They look for achieving their goals and draw the most benefits from the project. This complex environment can give rise to disputes. If the team fails in handling and managing disputes at an early stage it can lead to claims and conflicts which affect the project performance (Nguyen & Nguyen, 2020).

According to Hansen (2019), most construction project disputes are related to contracts. These include the quality of contract content, non-serviceable contract information, and unrealistic expectations of the customer. Contract documents can also lead to untimely contractual payments which create grounds for disputes (Hansen, 2019).

Some of the major causes of construction disputes are due to the speed of construction, scarce capital resources, and the cost and quality control. Errors in the initial cost estimations, changes in conditions, omissions, and reactions of stakeholders also can create grounds for disputes (Nguyen & Nguyen, 2020).

According to Naji *et al*., (2021), common root causes of construction disputes include lack of knowledge of the client, choice of inappropriate contract type, unrealistic estimations, tender pricing, and unclear risk allocation. They further indicate that weak communication, errors in design data and design documents, slow client response, and not selecting suitable contractors creates ground for disputes (Naji *et al*., 2021).

Further, Nguyen & Nguyen (2020) highlight the importance of the quality of communication and coordination among project participants that can create grounds for contract disputes (Nguyen & Nguyen, 2020). The professional capacity of the contractor is another dispute cause where resource limitations can affect contractual relations with increased tension between the employer and contractor (Nguyen & Nguyen, 2020).

Inefficiencies regarding the cooperation between the owner and the contractor and also between the principal contractor and the designer can cause disputes (Fadhlullah *et al*., 2019). Delay in payments is

one of such common causes of construction disputes where there are times that sub-contractor may delay the performance that affects the main contractor's performance.

Quoting Cheung & Yiu, Nguyen & Nguyen (2020) highlight that there are two major groups of causes for construction disputes. These are disputes related to construction techniques and disputes related to the behavior of humans. Figure 1 shows the major groups of causes of disputes.

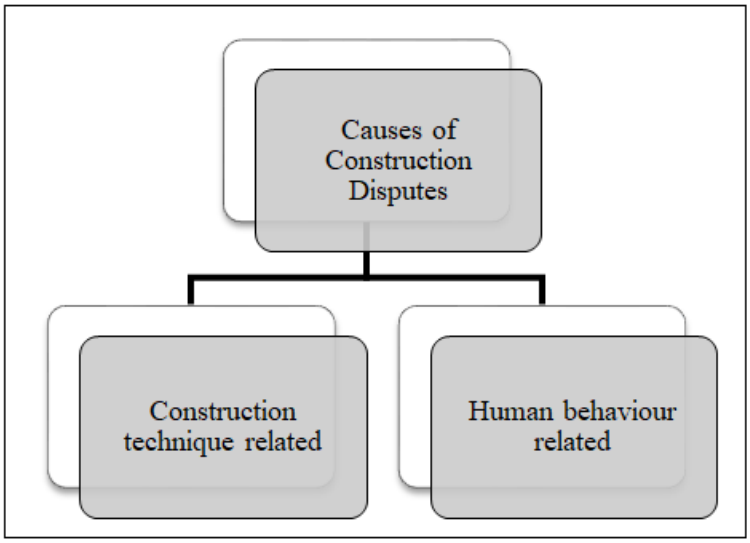


**Figure 1: Major groups of causes for construction disputes**
*Note.* Figure is done by the author

Team selection also affects construction disputes. Therefore, appropriate team selection helps in smooth project delivery minimizing possible disputes. As contract type has a significant impact on construction disputes, owners' early decisions on project delivery methods, procurement methods, and contract type can affect construction disputes during the project implementation stage (Hasanzadeh *et al*., 2018).

**Preventing construction disputes**

Avoiding all possible disputes that arise during a construction project performance is not possible. However, when the project team understands the causes of disputes, it is easy to find solutions that prevent disputes from arising due to such causes. Preventing disputes can affect positively on project performance which saves time, cost, and effort for the project team. Cultural differences can also create disputes in international construction. In such situations, understanding cultural differences can create a better flow of information exchange (Durand, 2019). Durand (2019) proposed strategies to prevent disputes that arise due to cultural differences. These include cultural awareness, creating positive interaction between the parties, background research on contractors and subcontractors from other countries, and hiring a consultant for the project.

Tanriverdi *et al*., (2021) suggest creating a casual map to identify possible causes of disputes. By analyzing the casual map, the project team can identify the interaction of each cause of disputes and then find solutions to prevent such possible disputes from arising. As per this study, it is beneficial to find the possible disputes that can arise in different phases of a project (Tanriverdi *et al.*, 2021).

According to the results of research done by Hayati & Latief (2019), they created a map that indicates variables, causes, and preventive actions of construction project disputes. They propose to identify risk mitigation actions after identifying the possible disputant causes. Some of the guidelines proposed by them include implementation of risk management planning and selection of a competent project team. They also suggest creating a detailed and accurate quality plan and specifications to ensure the achievement of the expected accuracy and quality of the project. Another suggestion by Hayati & Latief (2019) is to create a documentation system that can be used for proper record-keeping needs. In such a way, the documents that are required for the project can keep in a well-organized manner (Hayati & Latief, 2019).

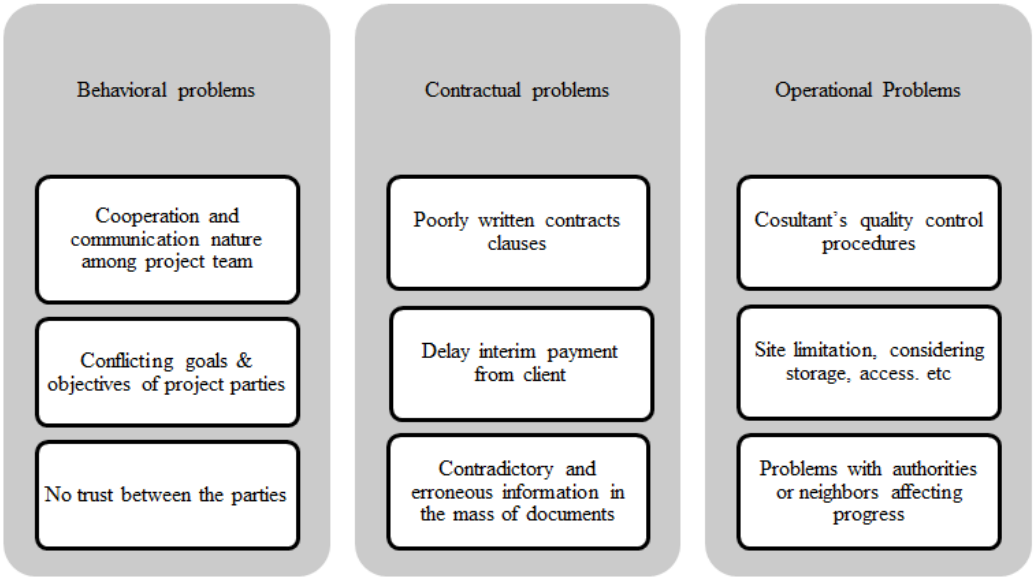


**Figure 2: Classification of factors which cause disputable claims**
*Note.* Figure is done by the author

According to Mohamed *et al*., (2014), effective claim management helps in reducing construction disputes. They classify the factors which cause disputable claims into three categories which are behavioral problems, contractual problems, and operational problems (Mohamed *et al*., 2014). Figure 2 shows the classification of factors that cause disputable claims with some examples. Such disputable claims are with the potential of resulting in disputes. Therefore, identifying and treating of these factors can prevent possible disputes.

**Role of communication in preventing disputes**

The purpose of communication is to transfer information from one party to another. Therefore, in good communication, the receiver receives the message exactly as intended by the sender (Carita, 2015). According to Carita (2015), presence, listening, talking & trust are the four steps to effective communication. Figure 3 illustrates the four steps to effective communication.

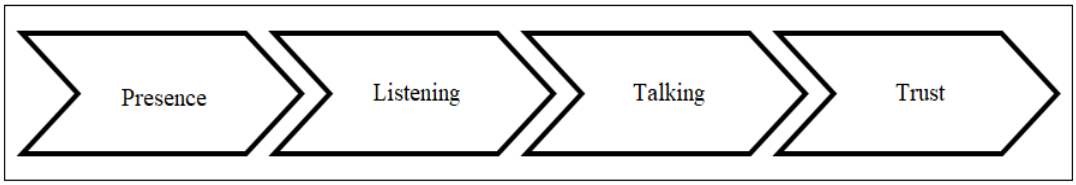


**Figure 3: The four steps to effective communication**
*Note.* Figure is done by the author

Effective Communication is important for the success of a construction project. There are a few different parties involved in a construction project. Each party to a project should communicate effectively with other parties to share information and achieve the project goals. Therefore, the role and impact of communication on disputes are very high.

El-Sayegh *et al*., (2020) identified causes of disputes that relate to communication. They identified the slow decision-making process of the owner as a major factor in disputes in construction projects that also affect the project progress. They further identified that delays in resolving disputes at an earlier stage of their arising can cause more disputes that can impact time, effort, and cost. According to them, a poorly defined project scope which is again part of communication can cause disputes.

Further, they highlighted the impact of a poorly written contract on a project that can create disputes because such a contract can lead to different interpretations by different parties (El-Sayegh *et al*., 2020).

As a whole, the lack of communication and lack of coordination between the parties to a construction project has a major impact on project performance. That can lead to disputes in the end. Poor communication can create confusion and misunderstanding among the parties related to the scope of work. Therefore, as a result, it can create disputes between the parties (El-Sayegh *et al*., 2020).

**Reasons for communication failure and effects on disputes**

Teamwork and team management are essential for the successful performance of any construction project. Therefore, communication plays a major role in keeping the teams connected by avoiding possible conflicts and disputes. On the other hand, effective communication aid in creating responsibilities among the team members. Thus it improves individual performance. By maintaining proper communication, it is also easy to establish good working relationships among the team members that impact minimizing possible disputes.

In a study to identify construction claim problems in Malaysia, Azmi *et al*., (2018) indicate the importance of communication skills of the project site staff. They found issues and disputes due to project claims arise as a result of poor communication. According to the same study, inaccessibility of documents is another reason that affects the problems arising from construction claim management (Azmi *et al*., 2018).

During the negotiation stage of claims, the contractor's ability to negotiate has an impact on convincing the owner about their claim situation and grounds. However, the contractor's lack of negotiation skills affects the claim process which can again cause conflicts and disputes (Azmi *et al*., 2018).

**Impact of failed communication between teams on project completion**

Different teams are working together on a construction project. Therefore, effective communication is important for the successful completion of a project. However, failed communication can lead to disputes that take more time to resolve. According to the studies analyzed so far, researchers identified that disputes can affect greatly on a project's success. Therefore, failed communication can impact negatively on successful project completion while effective communication can impact positively on a project's completion.

On the other hand, conflicts and disputes are inevitable in construction projects. This is due to the pressure of achieving project goals in a strict time frame using available resources (Newton, 2016). In most construction projects, resources are limited due to budget control. However, a project manager can handle many developing problems on a construction site by addressing them in the right way. Sometimes, informal discussions support solving possible issues and disputes (Newton, 2016).

Careful planning of project communication helps project managers to manage possible conflicts and disputes that can arise during a construction project. Project communication management includes three necessary steps as shown in Figure 4.

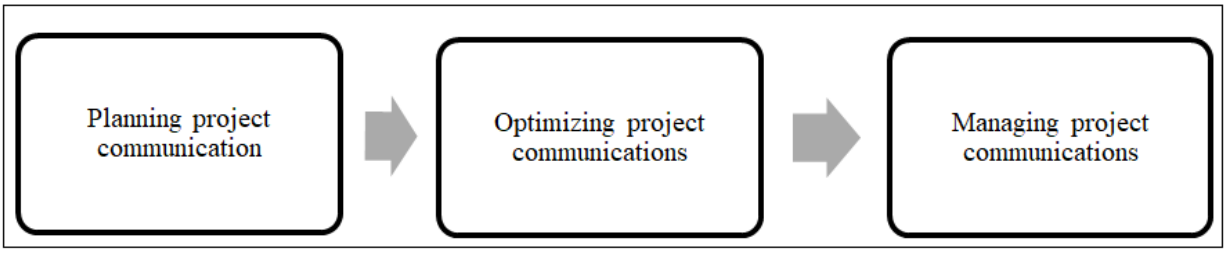


**Figure 4: The three steps to Project Communication Management**

*Note*. Figure is done by the author

**Planning project communication**

A communication plan is necessary for a project to make it successful by avoiding disputes. However, the project manager should prepare a communication plan before implementing a project. A construction project generates a large volume of data during the implementation stage. Therefore, it is vital to limit the quantity of information circulated, and the communication path in a project (Newton, 2016).

Over-communication can also result in information overload, missing key data, poor understanding, misinterpretation, errors, mistakes, and conflicts. Therefore, a construction project team needs to come up with an optimized project communication plan to prevent issues of poor communication such as disputes (Newton, 2016).

Figure 5 shows the possible impact of over-communication in a project. It is adapted from the book *Managing a Project Team: Project Skills* (Newton, 2016). Therefore, efficient & effective communication includes providing the right amount of information at the right time by using the right format (Newton, 2016).

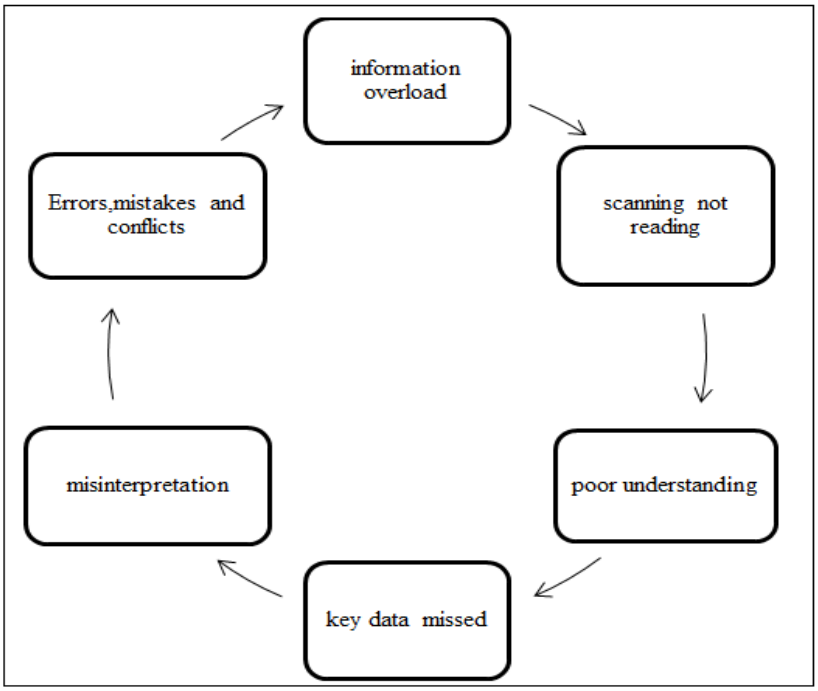


**Figure 5**: **Impact of over-communication**

*Note*. Figure is adapted from *Managing a Project team (1st ed.)*. (p. 44), by P. Newton, 2016, Bookboon. Copyright 2016 Paul Newton & Bookboon.com.

While an effective communication plan among the teams for a project is important, it is also essential to identify the level of communication for each team and each stakeholder group (Newton, 2016). A communication plan can address two communication levels. Those are high-level project communications and low-level project communications. Figure 6 below illustrates the communication levels to identify for a project and it is adapted from the book *Managing a Project Team: Project Skills* (Newton, 2016).

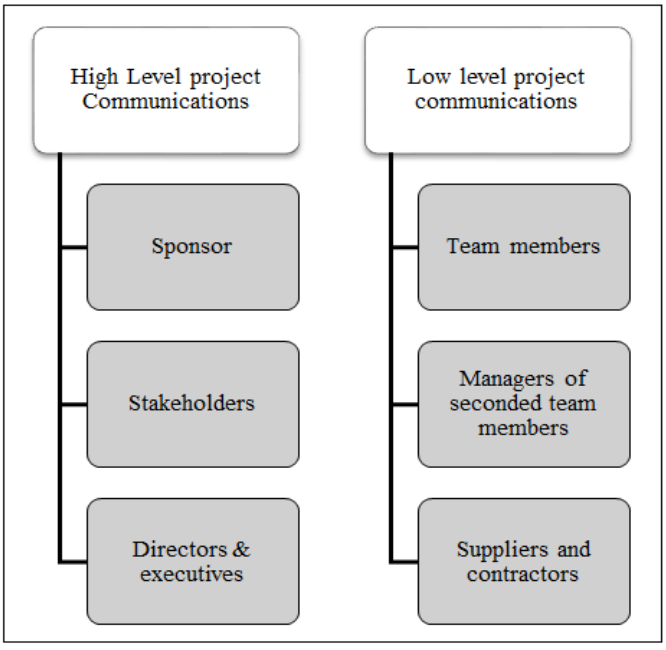


**Figure 6: Communication levels to identify for a project**

*Note*. Figure is adapted from *Managing a Project Team: Project Skills (1st ed.)*. (p. 52), by P. Newton, 2016, Bookboon. Copyright 2016 Paul Newton & Bookboon.com.

A project communication management plan should include communication models & methods, communication requirement analysis, and meetings & communication technology. Due to the importance of a

functional project communication plan for a project, this should plan during the project planning phase (Newton, 2016).

**Optimizing project communications**

Effective communication is fundamental for project success. This includes dealing with other parties in an efficient, productive, and empathetic way. Therefore, as described above, an effective communication management plan is vital for a project to enhance communication between different parties to the project who has different interests and skill levels. Further, this communication plan must be optimized to gain a better outcome (Newton, 2016).

In a construction project, communication mainly happens between the client, project manager, consultant, architect, and construction manager. Therefore, to improve communication and situation, it is vital to analyze both team organization and the digital tools used for enhancing communication (Boujaoudeh, 2019). Team leaders need to understand their audience when optimizing their project communication while making sure that communication methods suit the audience. The lack of a suitable mechanism that can motivate team members to effectively communicate can create communication issues in the construction industry that can also cause disputes (Boujaoudeh, 2019).

**Basic communication model**

The basic communication model consists of two concepts which are noise and decoding.

***Noise***

Noise is a barrier to effective communication. This includes anything that distracts or interferes with the transmission and understanding of a message. Unfamiliar technology can even create noise in communication which impacts effectiveness (Newton, 2016).

***Decoding***

Decoding is necessary to transform a message into a meaningful idea. This includes interpretation of a message received (Newton, 2016).

**Shannon Weaver communication transmission model**

Claude Shannon and Warren Weaver introduced eight elements that are necessary for communication to take place. Therefore, by identifying & understanding these elements, a manager can change each element according to the situation (Simpson, 2013). Figure 7 which is adapted from the book *High Value, Low-Cost Team Building Activities* (Simpson, 2013) shows Shannon Weaver's communication transmission model.

Communication is not completed until the receiver sends feedback to the sender (Newton, 2016). While there are many ways to communicate, project managers should decide the communication options for a specific construction project during the planning phase. Available communication options include emails, collaborative software, face-to-face and other formal or informal meetings (Newton, 2016).

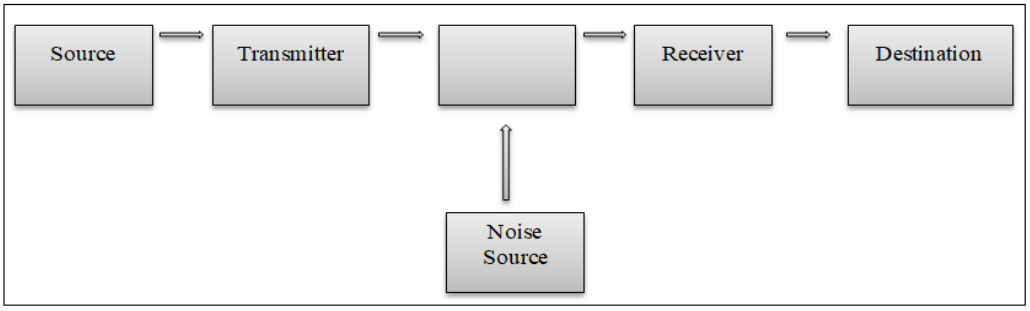


**Figure 7: Shannon Weaver communication transmission model**

*Note*. Figure is adapted from *High Value, Low Cost Team Building Activities (1st ed.)*. (p. 93), by S. Simpson, 2013, Bookboon. Copyright 2021 Sarah Simpson & Bookboon.com.

Mainly, there are three communication methods available which are, interactive communication, push communication and pull communication.

***Interactive Communication***

This is more efficient and it includes communication methods such as meetings, calls, and videoconferencing.

***Push Communication***

Emails, reports, memos, and voicemails are some examples of push communication. These are sent to receivers to share information. However, these methods do not ensure whether the receiver received it effectively or understands the original message intend to send (Newton, 2016).

***Pull Communication***

Pull communication includes methods that utilize the software for collaboration. Wikis and blogs

are examples of pull communication that can be used for sharing relevant information such as technical standards (Newton, 2016).

A construction project manager needs to understand his audience and decide on the most appropriate communication method to make it effective. He also needs to decide when, how and what to communicate based on the communication requirements of a construction project. For this purpose, he also needs to communicate and discuss with project stakeholders and team members to understand and determine the project communication requirements.

**Managing project communications**

Teamwork is essential to complete a project successfully. Effective communication is essential for successful teamwork. Therefore, effective communication among the team members is a must for any project to be successful. Project managers need to pay attention to creating a communication plan that enhances project communications (Newton, 2016).

Through a communication plan, a project manager needs to ensure that he covers all the stakeholders who are vital for the project or for sharing information. When the stakeholders understand their responsibilities and when the communication is effective and clear between the teams then that supports maintaining quality relationships.

Identifying conflicting factors and addressing those promptly is a critical success factor for a construction project.

**Identifying communication barriers**

Several barriers can affect the effectiveness of communication. A project manager can overcome these barriers if he identifies those. Some of the potential communication barriers that can affect effective communication during a construction project include language, distracting gestures, distractions, no focus, too much information, no eye contact, not listening, agendas, and lack of confidence (Simpson, 2013). It is also important to choose the correct media for communication otherwise it can create another barrier.

**Communicating in conflicting situations**

While disputes and conflicts are common in construction projects, project managers need to understand how to effectively communicate in conflicting situations. Effective communication can help in resolving conflicting matters and that can affect positively on the project's progress.

Thomas Kilmann introduced five styles of responding to conflicts. According to the Kilmann model, each style has both advantages and disadvantages. A project manager and leaders in the construction team can recognize each style that suits different conflicting situations. By recognizing each style, a project team can improve their emotional intelligence and interactions to support the site's progress (Simpson, 2013). Figure 8 which is adapted from the book *High Value, Low-Cost Team Building Activities* (Simpson, 2013) shows Thomas Kilmann model.

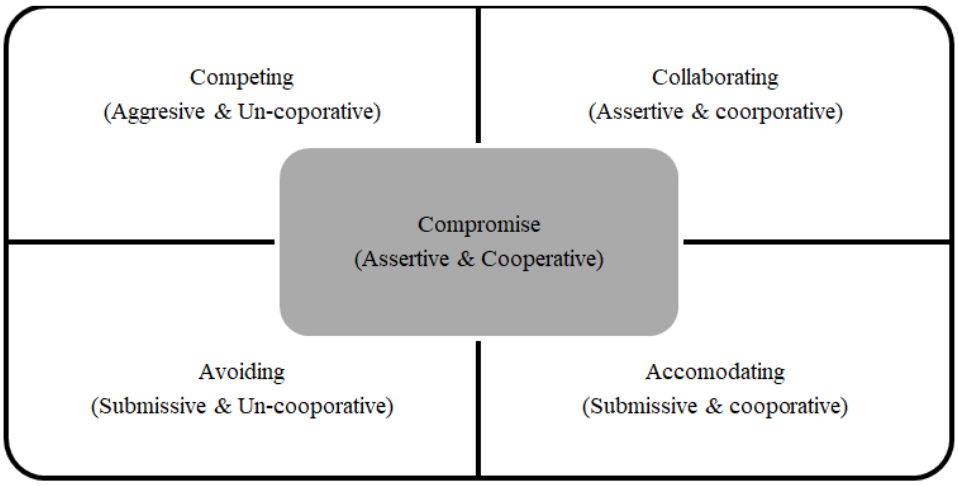


**Figure 8: Thomas Kilmann model**

*Note*. Figure is adapted from *High Value, Low Cost Team Building Activities (1st ed.)*. (p. 97), by S. Simpson, 2013, Bookboon. Copyright 2021 Sarah Simpson & Bookboon.com.

A conflict can escalate over time. Therefore, a better understanding of the different stages of a conflict and how conflicts escalate over time helps project teams to manage conflicts at an early stage. This will avoid the costly resolutions when a project starts to suffer at a later stage. Figure 9, which is from the book *High Value, Low Cost Team Building Activities* (Simpson, 2013) shows the stages of a conflict.

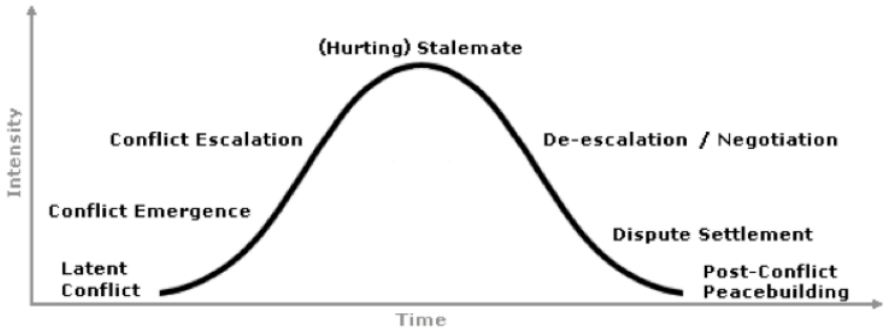


**Figure 9: Stages of a conflict**

*Note*. Figure is from *High Value, Low Cost Team Building Activities (1st ed.)*. (p. 98), by S. Simpson, 2013, Bookboon. Copyright 2021 Sarah Simpson & Bookboon.com.

## METHODOLOGY

The methodology used for this study is a literature review process where the author analyzed existing published work to find out how communication affects disputes in construction projects including the factors that affect effective communication. A literature review provides a better understanding of existing literature around the topic in the discussion that helps in identifying future research needs (Graulich *et al*., 2021). Figure 10 shows the steps followed by the author to evaluate and collect existing literature on related topics to support the writing of this paper.

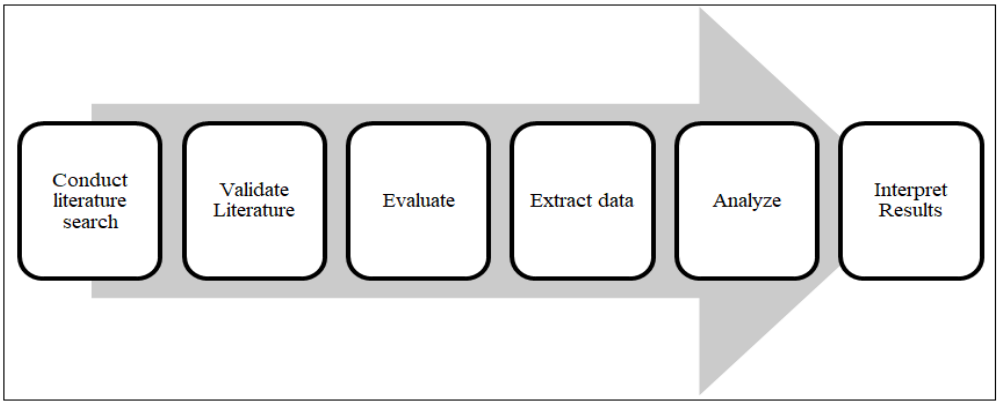


**Figure 10: Literature review steps**

*Note.* Figure is done by the author

Google scholar was the main search engine used to find existing literature. Those research papers were written on topics related to disputes in the construction industry. However, when collecting information, the author also referred to the existing literature on topics such as project management, team management, and communication.

Some research papers don't specifically focus on the effects of communication on construction disputes. However, those papers include causes of disputes and how to prevent disputes that give a clue on the importance of effective communication. Therefore, such literature is studied too to find out the factors that affect communication among the teams. Some of the keywords used to find relevant literature include, ''disputes in construction projects'', ''disputes and communication'' and ''project communication'' or a mix of these keywords.

***Criteria for selecting existing literature***

The below criteria were used to select existing literature for this study. These criteria helped in choosing the most appropriate literature to gather secondary data for this study.

- Papers need to be published from 2019 through 2022 to ensure that the latest research data is referred for the study
- Paper should be in English
- Paper needs to discuss the disputes or effective communication that affects project performance.
- Paper should be a published paper in a scientific journal
- Paper should be available with open access

Therefore, following these criteria, the author removed some of the literature that was published from 2019 to 2022 due to that literature doesn't follow other

requirements. However, due to the lack of existing literature that discusses the connection between effective communication and disputes in construction projects, the author also referred to other publications that discuss either project communication or disputes in general.

There were about 25,200 papers returned in the first round of Google Scholar search results. However, further reading of this existing literature resulted in ten pieces of existing literature that are relevant to the above criteria and the topic in the study. These ten papers were carefully studied to find out the factors that affect the communication effectiveness of a construction project.

## RESULTS AND FINDINGS

Below are the findings from the existing literature analyzed. According to Alaloul *et al*., (2019), if a conflict is not properly managed then it can quickly transform into a dispute. Disputes require resolutions and if there is no resolution achieved by the parties to the contract, then it can lead to a claim. Further, disputes are inevitable in construction projects and 10-30% of projects experience serious disputes (Alaloul *et al*., 2019).

During the construction stage, there are multiple resources involved in a project. Therefore, this stage is more open to potential disputes. Coordination between different stakeholders for a project is highly important in this stage (Nguyen & Nguyen, 2020). The same study highlights the importance of effective communication for a construction project to prevent disputes. They identify poor communication as behavior related cause of disputes.

Communication issues such as lack of proper work instructions, emergency response, and lack of job communication harm a construction project by creating grounds for disputes (Nguyen & Nguyen, 2020). A study conducted by El-Sayegh *et al*., (2020) identifies lack of communication and poor coordination between parties during the construction stage creates confusion about the work scope. This can result in disputes between the parties (El-Sayegh *et al*., 2020).

According to Shash & Habash (2020), changes to the contract document are one of the factors that cause disputes. In most construction contracts, changes and modifications to the contract occur as a way of responding to mistakes done in project documents. However, changes to project documents create contractual disputes due to changes in project cost, time, and effort required (Shash & Habash, 2020).

Shakeri & Khalilzadeh (2020) identify communication management as one of the main factors that affect the success of projects. According to them, it is necessary to distribute information among all stakeholders properly and timely. Further, they identified leadership, level of trust, stakeholders, geographical dispersion, culture, communication skills, communication tools, communication variety, knowledge, organizational structure and participation, infrastructure, technology, and level of information provided as the main factors that affect project communication (Shakeri & Khalilzadeh, 2020).

They further identified four variable factors that can be improved through effective communication. These four factors are team factors, technical factors, organizational factors, and environmental factors. Effective communication between stakeholders improves these four factors (Shakeri & Khalilzadeh, 2020).

Chen (2021) emphasizes the importance of project team and leader empowerment. According to his studies, both these factors affect a project's communication performance with its strategic partners. In this study, he further concludes on the impact of effective communication and trust between project stakeholders on project success (Chen, 2021).

In a study conducted to identify the risk factors that affect the overall cost risks in residential projects at the early stage, Badawy *et al*., (2022) identify poor communication between parties as a low-level risk. Tanriverdi *et al*., (2021) identify poor business relationships as one of the causes of construction disputes. According to his research, factors such as lack of communication between the parties and lack of team-building affect business relationships among the parties to a project.

A study conducted by Maharani *et al*., (2021) highlights the importance of information distribution as a factor for effective communication of construction projects that can reduce project failure. According to the studies done by Lee *et al*., (2021), contract documents should be clearly written to avoid possible disputes. Writing skills are an important part of communication and especially in construction projects, the contract documents and other writings should clearly indicate their purpose to the other parties. In this study, Lee *et al*., (2021) mention the letter of intent and how it causes disputes.

A letter of intent outlines the main terms of a contract and it indicates the intention of the employer to enter into a contract with a selected contractor. By using a letter of intent, the employer asks the contractor to start the work as described in the letter until the formal contract documents are prepared. To avoid possible disputes at a later stage, contractual parties need to understand the terms of a letter of intent including the project scope.

Therefore, it is important to follow clear written communication if an employer decides to issue a letter of intent until the contract documents are ready (Lee *et al*., 2021). Lack of document communication is another cause of disputes that also affects team spirit. Poor communication during the pre-tender stage of a construction project creates changes to the contract during the construction stage. These variations are a major cause of construction disputes (Edirisinghe *et al*., 2020). Hence, effective communication at the pre-tender stage is important to mitigate possible disputes.

According to the literature reviewed, it is obvious that effective communication plays a vital role in any construction project. Poor communication is one of the major causes for disputes. Below are the main factors identified that affect effective communication between project teams.

- Lack of proper work instructions, poor coordination between parties, and inefficiencies in proper distribution of necessary information among all stakeholders are some of the results of teams' human behavior factors that can cause disputes between the parties.
- The leadership skills of the project leaders also affect communication effectiveness and that can be classified as another human factor.
- Communication tools, communication variety, technical skills, infrastructure, and available technology are identified as technical factors that affect the effectiveness of communication among the teams for a construction project.
- Organizational factors such as project leadership, level of trust, communication skills of project team members, document communication, project communication plan and media, organizational structure, rank in the hierarchy, and stakeholders are organizational factors that affect communication effectiveness.
- Cultural factors such as communication variety, language skills, usage, use of body language, accent, and beliefs can affect communication among the teams.
- Another factor that affects effective communication includes environmental factors such as geographical dispersion and noise.
- It is also found that most of these factors can change with better project planning to achieve effective communication to minimize possible disputes. Training and education can improve factors such as human factors and technical factors.

In this study, five categories of factors that affect effective communication between teams of a construction project are identified. These five factor categories are shown in below Table 1.

**Table 1: Factors that affect effective communication to minimize disputes in construction projects**

| Factor Category | Example Situations |
|---|---|
| Human factors | Individual behavior<br>Lack of proper work instructions<br>Poor coordination between parties Inefficiencies in proper distribution of necessary information among all stakeholders<br>Leadership skills of the project leaders |
| Technical factors | Communication tools<br>Communication variety<br>Technical skills<br>Infrastructure and available technology |
| Organizational factors | Project leadership<br>Level of trust<br>Communication skills of project team members<br>Document communication<br>Project communication plan and media<br>Organizational structure and rank in hierarchy<br>Stakeholders |
| Cultural factors | Communication variety<br>Language skills and usage<br>Use of body language<br>Accent<br>Beliefs |
| Environmental factors | Geographical dispersion<br>Noise |

*Note*. Tabulation is done by the author to categorize the major factors that can affect effective communication between teams for a construction project.

## CONCLUSION

The objective of this study was to identify the factors that improve the project team's communication. Many studies have shown that poor communication is one of the causes of construction project disputes. Therefore, identification of the factors that affect communication helps project leaders to find solutions to improve those factors to achieve effective communication without failure. As a result, project leaders can minimize most of the construction disputes that arise due to communication failure.

This study identified five major factor categories that affect the effectiveness of communication between the teams of construction projects that are human factors, technical factors, organizational factors, cultural factors, and environmental factors. The findings of this study also suggest the importance of effective communication between the project teams to minimize the disputes that affect the overall project performance.

While it can be difficult to address the environmental factors that affect project communication negatively, project leaders can focus on minimizing the effects of these factors with better communication planning. If project leaders proactively identify the causes that can result in human factors, technical factors, and organizational factors, they can find out solutions to minimize the negative effects of inefficiency that results due to these factors. Cultural intelligence and awareness among the team members will prevent communication barriers due to cultural factors. Training and awareness programs can improve the cultural awareness of the team members which impacts positively team communication. By focusing on these five factors, project leaders can improve project performance by minimizing the disputes due to poor communication.

However, there are some gaps identified in this research. One of the major challenges was the lack of recent studies related to project communication. Although some studies have been done on construction project disputes and causes for such disputes, there were not many papers that discuss clearly the factors that cause poor communication. Therefore, this study suggests future research based on primary data to understand more factors that affect communication between construction project teams.

Further, most of the literature referred for this study was not focused on a specific geographical region or a country. Therefore, further studies that are focused on specific geographical locations will help find specific factors for a geographical region that affect the effective communication of construction projects.

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