

A Study on Factors Affecting Delays Due To Miscommunications among Stakeholders in Construction Projects

By

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Abstract

Miscommunications are the one of main cause for the project delays. As the various stakeholders are involved in the construction projects, the communication becomes the challenging thing. This research focuses on identification of factors affecting delays due to miscommunications among stakeholders and ranking the most influencing risky factors causing delays due to miscommunications. Factors were identified by both focus group interviews and literature review. In focus group interviews, 90 construction professionals were brainstormed, and factors were extracted. The identified factors are framed as questionnaire. Questionnaire survey was conducted, and 310 responses were collected. Responses were statically analysed through SPSS software. Pearson correlation test was used to know the reliability among the factors. The impact of within themselves was validated through Structural Equation Modelling. The rank of each factor was given by Relative Importance Index (RII ranking method). Most influencing factors identified are Digital illiteracy, Language barrier, Confusions, and disagreements between stakeholders regarding work, Inability to quickly identify the issue, Sudden modifications to plans and designs. Uneducated stakeholders have a negative influence on the project, as the communication is challenging due to the digital illiteracy of the stakeholders. In India the language barrier is the most affecting factor for miscommunications due to digital illiteracy. Stakeholders can overcome language barriers and ensure effective communication in construction projects in India by using translation services, providing language training, using visual aids, simplifying language, and regularly assessing and improving communication practices.

Keywords: Miscommunications, Stakeholders, Engagement, Communication Channels, Standardization.

Introduction

Miscommunications in a construction project occurs when there is a breakdown in the exchange of information, ideas, or expectations among different parties involved in the project. It can lead to misunderstandings, errors, delays, and cost overruns, which can negatively impact project outcomes, including quality, safety, and client satisfaction [1]. Miscommunication can have serious consequences on the construction project, including delays in project completion, rework, and legal disputes (Rahimian et al. 2022). Therefore, it is essential to identify and address the root causes of miscommunication and develop effective communication strategies and best practices to ensure smooth and effective communication among stakeholders (Xue et al. 2020).

Stakeholder is not involved in the appropriate communication, then there will be a breakdown in communication. The failure to communicate properly during construction projects has a detrimental effect on the entire project (Fredriksson et al. 2021). There are instances of poor communication at each and every stage of the project. Therefore, it is essential to conduct communication monitoring at each and every stage. The construction projects are behind schedule as a direct result of poor communication. When incorrect information is communicated or shared, it can cause entire works to be carried out in an incorrect manner (Walker, Bourne, and Shelley 2008). This results in rework and delays in projects, as well as affect the cost and scope of a construction project. It is essential to understand the relationship between the causes and effects of miscommunications in order to make effective decisions to improve communications among stakeholders (Safapour et al. 2019).

Communication is the process by which team members and organisations exchange information and other resources like ideas, knowledge, skills, and technology. The execution of a construction project typically involves several parties, including primary (owners, designers/engineers, and contractors) and secondary stakeholders (subcontractors and suppliers), so extensive information exchanges between primary and secondary stakeholders were required for the project to run smoothly.

A lack of stakeholder awareness can have negative impacts on a project or organization (Ershadi et al. 2021). When stakeholders are not fully informed or engaged, they may not understand the goals, objectives, or potential outcomes of a project. This can lead to confusion, miscommunication, and misunderstandings (Bohari et al. 2020). This results in missed opportunities for improvement and can make it more difficult to achieve project goals (Walker, Bourne, and Shelley 2008). Adoption of new technologies create challenges for communication among stakeholders. Stakeholders who are not comfortable with new technologies will be left out of important discussions or may not receive important updates (Holmström, Singh, and Främling 2015). In addition, some stakeholders may prefer traditional channels of communication, such as face-to-face meetings or printed materials, and may not be comfortable with the new technologies (Mok, Shen, and Yang 2015). Poor project management leads to a lack of accountability, which can make it difficult to identify and address communication challenges (Ballantyne, Lindholm, and Whiteing 2013). If project roles and responsibilities are not clearly defined, stakeholders may not understand their roles in the communication process, leading to confusion and inefficiencies. An improper communication plan among stakeholders can have several negative effects on a project, without a clear communication plan, stakeholders may not fully understand the goals, objectives, or timeline of the project, leading to misunderstandings and confusion (Cuppen et al. 2016). Improper communication plan leads to delayed decision-making, as stakeholders may not have the information, they need to make informed decisions (Lehtinen and Aaltonen 2020). Lack of stakeholder engagement can have significant negative effects on a project, when Stakeholders are disengaged, they are not able to provide the necessary support or input to help the project succeed. This leads to a reduced effectiveness of the project or organization, as stakeholders are not able to be contributing their full potential. there is an increased risk of unexpected challenges or issues arising. When the ineffective engagement of stakeholders occurs then the Stakeholders may not be aware of potential risks or may not be prepared to handle them, leading to increased project or organizational risk.

Various studies investigated the factors influencing better communication in construction projects. However, there has been lack of research in identifying miscommunications among stakeholders and validating the stakeholder factors using SEM. This is the research's gap. This study identifies the factors influencing miscommunications

among stakeholders. There is no proper awareness on stakeholder selection, the interests of the stakeholder are not identified in past research. Past studies are lacking in identifying the barriers for the adoption of technologies for communication among stakeholders (Merschbrock et al. 2018). There is lack of research on how secondary stakeholders affects the construction projects. The study's novelty is satisfied by validating the relationship between the factors influencing miscommunications and their impact on the construction delays.

Research Methodology

Figure 1 depicts the study's research methodology and As a part of research, delays due to miscommunications among stakeholders was identified. Through literature review some factors are extracted. To identify the current issues causing miscommunications in the construction projects, a focus group interview was conducted by arranging personal interviews with total ninety construction stakeholders. Eighteen site engineers, fifteen project managers, twenty-three contractors, thirty-five secondary stakeholders (local communities) nearby ongoing construction projects. The factors were gathered from focus group interviews as well as the literature, and questionnaires were framed. A questionnaire survey was conducted, and 310 samples were obtained from various construction professionals. SPSS tools were used to analyse the questionnaire responses. Pearson correlation coefficient analysis was performed to determine the strength of correlation within those factors affecting miscommunications. SEM analysis was performed to validate the positive relationship between the factors and their impact on the delays. With RII method the ranking of the factors is given to identify the most influencing factors. Based on the collected data and responses, recommendations are given to mitigate the factors causing the miscommunications.

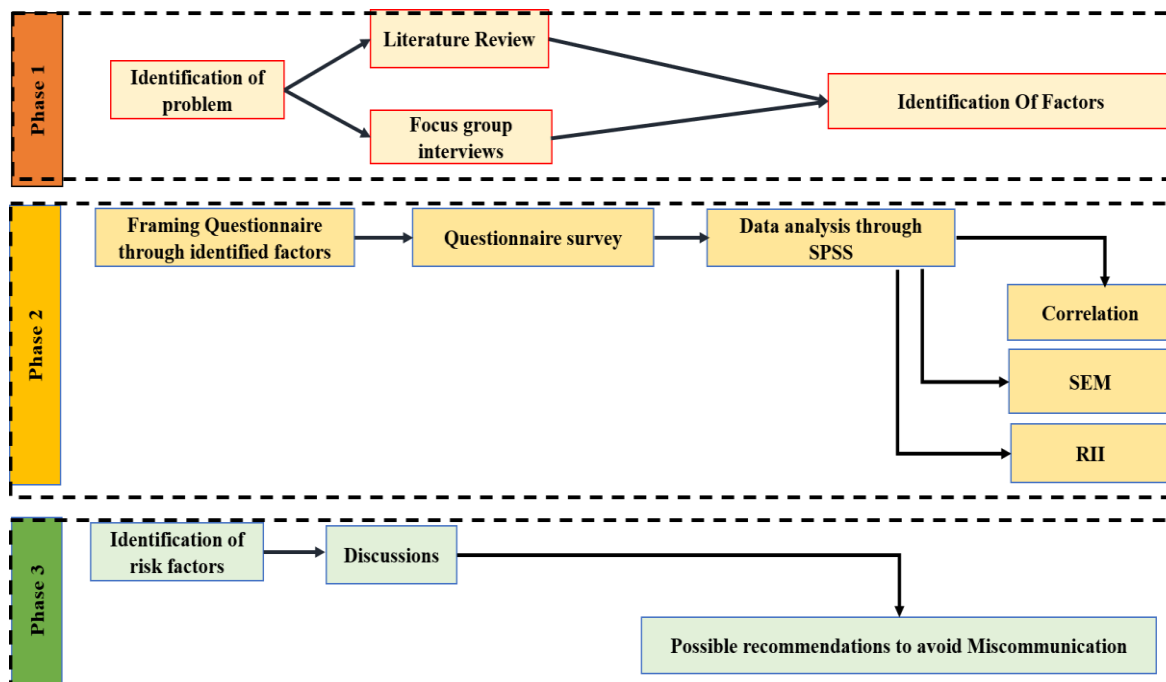


Figure 1: Research Methodology

Data collection

As a part of data collection, the data is collected by the literature review and focus group interviews.

3.1 Identification of factors through literature review

Literature review is done to know the past studies on communication among stakeholders and to identify the factors causing miscommunications and how they are affecting the project. Critical analysis of the existing research and scholarly articles on a communication among stakeholders. Those research papers are summarized and synthesized the findings and identified gaps and inconsistencies in the literature.

Table 1. *Factors identified through literature review*

S.No	Miscommunication Factors	Author
1	Trust issues among the stakeholders	Franciscode Oliveira (2019)
2	Unaware of the project, yet has a greater effect on it	Franciscode Oliveira (2019)
3	Different stakeholders have different purposes.	Franciscode Oliveira (2019)
4	Not respecting another stakeholder's perspective	Franciscode Oliveira (2019)
5	Inability to quickly identify the issue	Yang Liu, Xin Jin(2022)
6	Sudden modifications to plans and designs	Yang Liu, Xin Jin(2022)
7	Confusions and disagreements between stakeholders regarding work	Yang Liu, Xin Jin(2022)
8	Clearly defining each stakeholder's goals	Francesco Di Maddaloni(2022) (Safapour et al. 2019)
9	Identifying and maintaining a suitable work culture	Francesco Di Maddaloni(2022)
10	Understanding the expectations of the team	Francesco Di Maddaloni(2022)
11	Creating an environment that encourages teamwork	Francesco Di Maddaloni(2022)
12	Implanting team building program	Yang Liu, Xin Jin(2022)
13	Open-minded and willing to listen to suggestions from all stakeholders.	Yang Liu, Xin Jin(2022)
14	Building trust and improving coordination	Franciscode Oliveira (2019)

3.2 Factors identified through focus group interviews

To identify the current issues causing miscommunications in the construction projects, a focus group interview was conducted by arranging personal interviews with the different stakeholders by visiting sites and factors are identified by personal interviews. In focus group interviews, 90 construction professionals with eighteen site engineers, fifteen project managers, twenty-three contractors, thirty-five secondary stakeholders (local communities) nearby ongoing construction projects were brainstormed, and factors were extracted. The questions were prepared for interview by considering past studies and the current issues they are facing by the stakeholders in ongoing projects. The following are the factors identified.

1. Lack of training
2. Incapable of communicating local language, Hindi and English with project workers and higher officials
3. Unable to read drawings, communicate the strategy to workers and carryout projects effectively
4. Weak analytical abilities in identification of problems
5. Improper relationship with the project manager and not able to express ideas and views.
6. Unclear regulations
7. Delayed approvals

8. Inconsistent enforcement of regulations
9. Lack of coordination between multiple agencies
10. Frequent changes in regulations
11. Each party involved has its own agenda
12. Hidden and negative goals of the individual stakeholders
13. Passing on incorrect information can lead miscommunications
14. Feeling of competitive threat from other stakeholders
15. Struggling to make quick decisions when a problem arises
16. Insufficient communication with members of the inventory and equipment teams
17. Misunderstanding project requirements
18. Mis interrupting design plans
19. Inability to understand technical language
20. Digital illiteracy
21. Unable to evaluate quality of work

3.3 Questionnaire design

The questionnaire design was done based on the factors collected. Through literature review 15 factors are identified and through focus group interview 21 factors are identified. The total factors were grouped into six key factors.

3.3.1 Grouping of factors

The factors causing miscommunications identified through focus group and literature review are grouped into six key factors such as Site engineers' capabilities, Government agencies, Stakeholders' actions, Execution miscommunication, Uneducated stakeholders and working environment as given in Table 2.

Table 2: Grouping of Factors

Causes of miscommunications	Main factors
Lack of training	
Incapable of communicating local language, Hindi and English with project workers and higher officials	Site engineers' capabilities
Unable to read drawings, communicate the strategy to workers and carryout projects effectively	
Weak analytical abilities in identification of problems	
Improper relationship with the project manager and not able to express ideas and views.	
Unclear regulations	
Delayed approvals	Government agencies
Inconsistent enforcement of regulations	
Lack of coordination between multiple agencies	
Frequent changes in regulations	
Trust issues among the stakeholders	Stakeholders' actions
Unaware of the project, yet has a greater effect on it	
Different stakeholders have different purposes.	
Not respecting another stakeholder's perspective	
Each party involved has its own agenda	
Hidden and negative goals of the individual stakeholders	
Passing on incorrect information can lead miscommunications	
Feeling of competitive threat from another stakeholder	

Inability to quickly identify the issue	Execution miscommunication
Sudden modifications to plans and designs	
Confusions and disagreements between stakeholders regarding work.	
Struggling to make quick decisions when a problem arises	
Insufficient communication with members of the inventory and equipment teams.	Uneducated stakeholders
Misunderstanding project requirements	
Mis interrupting design plans	
Inability to understand technical language	
Digital illiteracy	Working environment
Unable to evaluate quality of work	
Clearly defining each stakeholder's goals	
Identifying and maintaining a suitable work culture	
Understanding the expectations of the team	
Creating an environment that encourages teamwork	
Implanting team building program	
Open-minded and willing to listen to suggestions from all stakeholders.	
Building trust and improving coordination	
Flexibility and a positive working relationship with team members	

Data analysis and validation

A questionnaire survey was conducted, and 310 responses received from various construction professionals. The responses were analysed using multivariate statistical techniques. On a 7-point Likert scale, the questionnaire responses were received. Data was analysed by using SPSS tools. By using Pearson Correlation, the relationship between the factors were given. The factors were validated through Structural Equational Modelling. Rank of each factor was given by RII ranking method.

Table 3. *Pearson Correlation among factors affecting miscommunication*

Affecting factors	Site engineers' capabilities	Government agencies	Stakeholders' actions	Execution miscommunications	Uneducated stakeholders	Working environment
Site engineers' capabilities	1	0.748	0.571	0.492	0.475	0.415
Government agencies	0.748	1	0.747	0.613	0.466	0.375
Stakeholders' behavior	0.571	0.747	1	0.559	0.533	0.375
Execution miscommunications	0.492	0.613	0.559	1	0.579	0.348
Uneducated stakeholders	0.475	0.466	0.533	0.579	1	0.438
Working environment	0.415	0.375	0.384	0.348	0.438	1

Table 3 shows the linear relationship between the three factors of causes of miscommunication with each other. Denotes significant at 1% level The Spearman's rank correlation coefficient ranges from +1 to -1. Where +denotes a perfect positive relationship, -1 denotes a perfect negative relationship, and values close to zero denote little or no correlation. The correlation between Site engineers' capabilities and Government agencies is 0.748, Site engineers' capabilities and Stakeholders' actions is 0.571, Site engineers' capabilities and execution miscommunications 0.492, Site engineers' capabilities and uneducated stakeholder is 0.475, Site engineers' capabilities and working environment is 0.415.

4.1 Structural equation modelling

Structural Equation Modelling describes how closely the factors that are affecting miscommunications in construction projects. The SEM is a statistical technique for analysing the relationships in a model between latent variables (causes of miscommunications among stakeholders) and observed variables (effects of miscommunications). Site engineers' capabilities ($R^2=0.3$) Government agencies ($R^2=0.4$), Stakeholders' actions ($R^2=0.5$), Execution miscommunications ($R^2=0.3$), Uneducated stakeholders ($R^2=0.3$), working Environment ($R^2=0.72$)(Indhu and Yogeswari 2021). (Where, R^2 is representing Squared multiple correlations) correlated with one another and have an impact on the miscommunications. As shown in Figure 2.

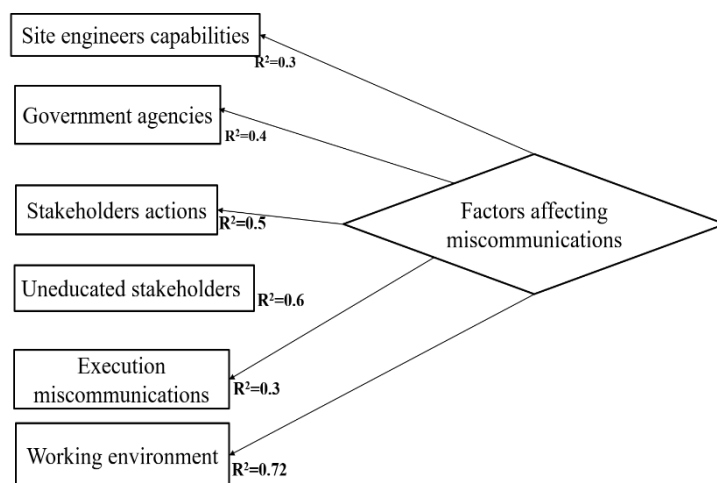


Figure2: Factors validated though structure equation modelling

Table 4: P values of the factors

Factors affecting miscommunication	Unstandardised coefficient (B)	Standard Error of B	Standardised coefficient	t value	p value
Site engineers' capabilities	2.010	0.119	0.721	17.162	<0.001**
Government agencies	2.041	0.113	0.793	21.864	<0.001**
Stakeholders' behavior	2.699	0.198	0.718	15.426	<0.001**
Execution miscommunications	3.152	0.205	0.628	12.715	<0.001**
Uneducated stakeholders	2.098	0.224	0.594	14.513	<0.001**
Working environment	2.199	0.194	0.587	13.165	<0.001**

Table 4 shows that (**) indicates significant at the 1% level. The most significant cause is an unstandardized coefficient of 'Execution miscommunications (3.512), followed by Stakeholders' behavior (2.699), and 'Working environment (2.199), followed by Uneducated stakeholders (2.098) and followed by Government agencies (2.041) and followed by Site

engineers' capabilities (2.010) 'Site engineers' capabilities is associated with causes of miscommunications (B = 0.721, p-value 0.001); 'Government agencies is associated causes of miscommunications (B = 0.793, p-value 0.001); 'Stakeholders' behavior'is associated with causes of miscommunications (B = 0.718, p-value 0.001); and Execution miscommunications are associated with 'causes of miscommunications (B = 0.628, p-value 0.001) and Execution miscommunications are associated with 'causes of miscommunications (B=0.594, p-value 0.001), Execution miscommunications are associated with 'causes of miscommunications (B=0.587, p-value 0.001) There is no such thing as a negative coefficient. In this study, all five causes are shown to have an impact on the miscommunications.

4.2 Relative Importance Index (RII ranking method)

Relative Importance Index (RII) is used to determine the relative importance of quality factors involved. The points of Likert scale used is equal to the value of W, weighting given to each factor by the respondent. RII is calculated by using the formula $RII = \Sigma W / (A * N)$

Table.5: Ranking factors with respect to Age

Miscommunication Factors	Age					
	20-30 years		31-40 years		Above 40	
	Score	Rank	Score	Rank	Score	Rank
Lack of training	5.785	14	5.685	12	5.785	12
Incapable of communicating local language, Hindi and English with project workers and higher officials	5.760	16	5.760	16	5.760	16
Unable to read drawings, communicate the strategy to workers and carryout projects effectively	5.720	12	5.720	14	5.720	13
Weak analytical abilities in identification of problems	5.711	18	5.711	18	5.711	18
Improper relationship with the project manager and not able to express ideas and views.	5.686	13	5.686	13	5.686	14
Unclear regulations	5.623	6	5.623	6	5.623	6
Delayed approvals	5.619	15	5.619	15	5.619	15
Inconsistent enforcement of regulations	5.610	17	5.610	17	5.610	17
Lack of coordination between multiple agencies	5.602	35	5.602	35	5.602	34
Frequent changes in regulations	5.582	7	5.582	7	5.582	7
Trust issues among the stakeholders	5.571	36	5.571	36	5.571	36
Unaware of the project, yet has a greater effect on it	5.565	8	5.565	8	5.565	8
Different stakeholders have different purposes.	5.559	19	5.559	20	5.559	19
Not respecting another stakeholder's perspective	5.548	21	5.548	21	5.548	21
Each party involved has its own agenda	5.530	5	5.530	5	5.530	5
Hidden and negative goals of the individual stakeholders	5.524	20	5.524	19	5.524	20
Passing on incorrect information can lead miscommunications	5.516	22	5.516	28	5.516	22
Feeling of competitive threat from other stakeholders	5.506	9	5.506	9	5.506	9
Inability to quickly identify the issue	5.482	27	5.482	27	5.482	27
Sudden modifications to plans and designs	5.461	26	5.461	26	5.461	26
Confusions and disagreements between stakeholders regarding work.	5.442	28	5.442	22	5.442	28
Struggling to make quick decisions when a problem arises	5.424	29	5.424	29	5.424	29
Insufficient communication with members of the inventory and equipment teams.	5.406	10	5.406	10	5.406	10

Misunderstanding project requirements	5.686	25	5.394	25	5.394	25
Mis interrupting design plans	5.364	2	5.364	2	5.364	2
Inability to understand technical language	5.342	3	5.342	3	5.342	3
Digital illiteracy	5.785	1	5.329	1	5.329	1
Unable to evaluate quality of work	5.306	30	5.306	30	5.306	30
Clearly defining each stakeholder's goals	5.291	32	5.291	32	5.291	32
Identifying and maintaining a suitable work culture	5.270	31	5.270	31	5.270	31
Understanding the expectations of the team	5.216	4	5.216	4	5.216	4
Creating an environment that encourages teamwork	5.151	24	5.151	24	5.151	24
Implanting team building program	5.125	34	5.125	34	5.125	35
Open-minded and willing to listen to suggestions from all stakeholders.	5.081	11	5.081	11	5.081	11
Building trust and improving coordination	5.056	33	5.056	33	5.056	33
Flexibility and a positive working relationship with team members	5.785	23	5.785	23	5.785	23

Table.5 gives the ranking of the miscommunication factors with respect to age, in this the digital illiteracy is the top influencing factor.

Table 6: *Ranking factors with respect to Qualification*

Miscommunication Factors	Qualification					
	Diploma		UG		PG	
	Score	rank	Score	rank	Score	rank
Lack of training	5.785	14	5.785	12	5.785	12
Incapable of communicating local language, Hindi and English with project workers and higher officials	5.760	16	5.760	16	5.760	16
Unable to read drawings, communicate the strategy to workers and carryout projects effectively	5.720	12	5.720	14	5.720	13
Weak analytical abilities in identification of problems	5.582	7	5.711	18	5.711	18
Improper relationship with the project manager and not able to express ideas and views.	5.686	13	5.686	13	5.686	14
Unclear regulations	5.623	6	5.623	6	5.623	6
Delayed approvals	5.619	15	5.619	15	5.619	15
Inconsistent enforcement of regulations	5.610	17	5.610	17	5.610	17
Lack of coordination between multiple agencies	5.602	35	5.602	35	5.602	34
Frequent changes in regulations	5.711	18	5.582	7	5.582	7
Trust issues among the stakeholders	5.571	36	5.571	36	5.571	36
Unaware of the project, yet has a greater effect on it	5.565	8	5.565	8	5.565	8
Different stakeholders have different purposes.	5.559	19	5.559	20	5.559	19
Not respecting another stakeholder's perspective	5.548	21	5.548	21	5.548	21
Each party involved has its own agenda	5.530	5	5.530	5	5.530	5
Hidden and negative goals of the individual stakeholders	5.524	20	5.524	19	5.524	20
Passing on incorrect information can lead miscommunications	5.516	22	5.394	25	5.516	22
Feeling of competitive threat from other stakeholders	5.342	3	5.506	9	5.506	9
Inability to quickly identify the issue	5.482	27	5.482	27	5.482	27
Sudden modifications to plans and designs	5.461	26	5.461	26	5.461	26
Confusions and disagreements between stakeholders regarding work.	5.442	28	5.442	22	5.442	28

Struggling to make quick decisions when a problem arises	5.424	29	5.424	29	5.424	29
Insufficient communication with members of the inventory and equipment teams.	5.406	10	5.406	10	5.406	10
Misunderstanding project requirements	5.686	25	5.442	28	5.394	25
Mis interrupting design plans	5.364	2	5.364	2	5.364	2
Inability to understand technical language	5.506	9	5.342	3	5.342	3
Digital illiteracy	5.785	1	5.329	1	5.329	1
Unable to evaluate quality of work	5.306	30	5.306	30	5.306	30
Clearly defining each stakeholder's goals	5.291	32	5.291	32	5.291	32
Identifying and maintaining a suitable work culture	5.270	31	5.081	11	5.270	31
Understanding the expectations of the team	5.216	4	5.216	4	5.216	4
Creating an environment that encourages teamwork	5.151	24	5.151	24	5.151	24
Implanting team building program	5.125	34	5.125	34	5.125	35
Open-minded and willing to listen to suggestions from all stakeholders.	5.081	11	5.270	31	5.081	11
Building trust and improving coordination	5.056	33	5.056	33	5.056	33
Flexibility and a positive working relationship with team members	5.785	23	5.785	23	5.785	23

Table.6 gives the ranking of miscommunication factors with respect to the qualification, according to three groups digital illiteracy is the top-ranking factor.

Table7: Ranking factors with respect to experience

Miscommunication Factors	Experience					
	5-10 years		10-20 years		20+ years	
	Score	rank	Score	rank	Score	rank
Lack of training	5.785	14	5.785	12	5.785	12
Incapable of communicating local language, Hindi and English with project workers and higher officials	5.760	16	5.760	16	5.619	15
Unable to read drawings, communicate the strategy to workers and carryout projects effectively	5.720	12	5.720	14	5.406	10
Weak analytical abilities in identification of problems	5.711	18	5.711	18	5.711	18
Improper relationship with the project manager and not able to express ideas and views.	5.686	13	5.686	13	5.686	14
Unclear regulations	5.623	6	5.623	6	5.623	6
Delayed approvals	5.619	15	5.619	15	5.760	16
Inconsistent enforcement of regulations	5.610	17	5.610	17	5.610	17
Lack of coordination between multiple agencies	5.602	35	5.602	35	5.602	34
Frequent changes in regulations	5.582	7	5.582	7	5.582	7
Trust issues among the stakeholders	5.424	29	5.571	36	5.571	36
Unaware of the project, yet has a greater effect on it	5.565	8	5.565	8	5.506	9
Different stakeholders have different purposes.	5.559	19	5.559	20	5.559	19
Not respecting another stakeholder's perspective	5.548	21	5.548	21	5.482	27
Each party involved has its own agenda	5.530	5	5.506	9	5.530	5
Hidden and negative goals of the individual stakeholders	5.482	27	5.524	19	5.524	20
Passing on incorrect information can lead miscommunications	5.516	22	5.516	28	5.516	22

Feeling of competitive threat from other stakeholders	5.506	9	5.530	5	5.565	8
Inability to quickly identify the issue	5.524	20	5.482	27	5.548	21
Sudden modifications to plans and designs	5.461	26	5.461	26	5.394	25
Confusions and disagreements between stakeholders regarding work.	5.442	28	5.442	22	5.442	28
Struggling to make quick decisions when a problem arises	5.571	36	5.424	29	5.424	29
Insufficient communication with members of the inventory and equipment teams.	5.406	10	5.081	11	5.686	13
Misunderstanding project requirements	5.686	25	5.394	25	5.461	26
Mis interrupting design plans	5.364	2	5.364	2	5.364	2
Inability to understand technical language	5.342	3	5.342	3	5.342	3
Digital illiteracy	5.785	1	5.329	1	5.329	1
Unable to evaluate quality of work	5.785	23	5.306	30	5.306	30
Clearly defining each stakeholder's goals	5.291	32	5.291	32	5.151	24
Identifying and maintaining a suitable work culture	5.270	31	5.270	31	5.270	31
Understanding the expectations of the team	5.216	4	5.216	4	5.216	4
Creating an environment that encourages teamwork	5.151	24	5.151	24	5.151	24
Implanting team building program	5.125	34	5.125	34	5.125	35
Open-minded and willing to listen to suggestions from all stakeholders.	5.081	11	5.406	10	5.081	11
Building trust and improving coordination	5.056	33	5.056	33	5.056	33
Flexibility and a positive working relationship with team members	5.306	30	5.785	23	5.785	23

Table.7 gives the ranking of miscommunication factors with respect to the qualification, according to three groups digital illiteracy is the top-ranking factor.

Table8: *Ranking most influencing factors*

Miscommunication Factor	Rank	Key factor
Digital illiteracy	1	Uneducated stakeholders
Language barrier	2	Site engineers' capabilities
Confusions and disagreements between stakeholders regarding work.	3	Execution miscommunications
Inability to quickly identify the issue	4	Execution miscommunications
Sudden modifications to plans and designs	5	Execution miscommunications
Misunderstanding project requirements	6	Uneducated stakeholders
Inability to understand technical language	7	Uneducated stakeholders
Unclear regulations	8	Government agencies
Inconsistent enforcement of regulations	9	Government agencies
Unaware of the project, yet has a greater effect on it	10	Stakeholders' actions

Table.8 shows the ranking of the most influencing factors digital illiteracy is the most ranked factor and uneducated stakeholder is the key factor. Language barrier is the second most ranked factor; site engineer capabilities is the key factor. Confusions and disagreements between stakeholders regarding work is third ranked factor, Execution miscommunications is the key factor.

Discussions

The previous studies mainly focused on the factors influencing the better communication and coordination in construction projects. Those studies gave the importance of the factors with p value the following factors [7]. Trust issues among the stakeholders (0.019a), Not respecting another stakeholder's perspective (0.024a), Building trust and improving coordination (0.010a), Inability to quickly identify the issue, understanding the expectations of the team (0.014a), Confusions and disagreements between stakeholders regarding work (0.047a), creating an environment that encourages teamwork (0.025a), building trust and improving coordination (0.029a). In this research as the current factors are identified and all the factors are analysed and validated and ranked by using RII ranking method. The results of RII values and the respective ranks for all the items of the independent variables with same frequency. It can be observed that the items such as Misunderstanding project requirements Digital illiteracy (Rank 1), Frequent changes in regulations (Rank =2), Confusions and disagreements between stakeholders regarding work. (Rank =3). Inability to quickly identify the issue (Rank=4) Sudden modifications to plans and designs (Rank =5), Misunderstanding project requirements (Rank=6), Inability to understand technical language (Rank=7), Unclear regulations (Rank=8), Inconsistent enforcement of regulations (Rank=9), Unaware of the project, yet has a greater effect on it (Rank=10), have the highest impotence when compared to the other items of the independent variables based on their RII values.

Recommendations

Miscommunications among Stakeholders in construction projects can be reduced by establishment of a single point of contact, use of collaborative technology, by providing training, encouragement of face-to-face communication, by clarifying expectations, addressing issues promptly. These steps will help to build trust and prevent miscommunications. It is important to remember that effective communication is a continuous process and stakeholders should regularly assess and improve their communication practices throughout the project. Stakeholders can overcome language barriers and ensure effective communication in construction projects in India by using translation services, providing language training, using visual aids, simplifying language and regularly assessing and improving communication practices. These strategies can help to improve communication and build trust among stakeholders. To overcome these barriers, there needs to be a concerted effort from the government, private sector, and civil society to improve infrastructure, reduce the cost of technology, promote digital literacy, develop multilingual platforms, enhance privacy and security, and create a supportive regulatory environment. By addressing these barriers, communication technology can become more accessible, affordable, and user-friendly, leading to greater adoption and uptake in India.

Conclusion

By conducting the focus group interviews and literature review the causes for the miscommunications were identified. The factors are collected and grouped into six key factors site engineer's capabilities, government agencies, stakeholders' actions, execution miscommunications, uneducated stakeholders, working environment. Questionnaire was designed and circulated to construction professionals under various categories, such as age, qualification of the stakeholders and experience in construction industry. The received responses are analysed by statically by SPSS tool and by using. Pearson correlation test gave the positive relationship between the factors. Structural equation modelling the factors are

validated. The ranking of each factor was given by RII ranking method. Digital illiteracy (rank 1) is the most influencing factor. Different stakeholders are having individual causes for the miscommunications. In India the language barriers and digital illiteracy is the most common and important factor to be more focused to overcome the miscommunications.

Future scope

Delays due to miscommunications alone were identified, other effects due to miscommunications can be focused.

Limitation

The study region is limited to Chennai region, this study can be taken to the other regions in India.

Statement and Declaration

“All authors have made a substantial contribution to the study. The study material preparation, data collection, analysis of data and design framework were performed by [Peketi Sai Sasidhar Reddy] and [Indhu B]. the first draft was written by [Peketi Sai Sasidhar Reddy] and the other author commented on the first draft of the manuscript. All authors read and approved the final draft”

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