Analysing Delays of Construction Projects in Western Part of Mumbai: Causes and Effects

Sandeep V. Gujjar, Soham Sawant, Ashish P. Kulkarni, Chaitali R. Kulkarni, Shivani G. Khabale, Usha N. Mane, Anand M. Hunashyal

Abstract: Construction is one of the most important employment sectors in India with very minimal research being done to identify the delay factors and causes that affect the construction Industry. The opinions of the construction professional required for the research was obtained by conduction interviews. A set of questions were circulated between the professionals working on the site to acquire the causes and effects of delays faced by them. To resolve the issues various studies and researches have been done by various researchers. The data analyzed in the research was done by using Relative Important Index (RII) which helpsto categories and rank the causes of delays according to the importance of the causes with respect to its contribution towards time delays, arbitration, litigation, cost overrun and total abandonment. Spearmen's rank correlation coefficient was used compare the effect of delays between contractors, owners and consultants. In this paper, the research is aimed towards finding the effects of various causes on the various parties on construction sites of coastal parts of Mumbai and methods of minimization of the same.

Keywords: Construction delays, Relative Important Index, Spearmen's rank correlation coefficient, ANOVA

I. INTRODUCTION

The completion of a scheduled project is a difficult task to accomplish in the unpredictable, complicated, multipartner and competitive construction environment[6]. In recent times, studies and researches which help torecognize the factors that contribute to delays in project completion work, cost overrun[13], and inefficient completion of construction as well as identifying the financial and planning obstacles are carried out.

Sandeep V. Gujjar*, Assistant Professor, Department of Civil Engineering, Pillai HOC College of Engineering and Technology, Rasayani, Dist. Raigad, Maharashtra, India.
E-mail: sandeep.gujjar@rediffmail.com
Soham Sawant, Department of Civil and Infrastructure Engineering, Rustomjee Academy for Global Careers, Dahanu road (E), Maharashtra, India affiliated to University of Wolverhampton, UK.
E-mail: Scotsoham23@gmail.com
Ashish Kulkarni, Department of Construction Project Management, Pillai HOC College of Engineering and Technology, Rasayani, Dist. Raigad, Maharashtra, India. E-mail: officialashish2996@gmail.com
Chaitali R., Department of Civil Engineering, Pillai HOC College of Engineering and Technology, Rasayani, Dist. Raigad, Maharashtra, India. E-mail: 16chaitalik@gmail.com
Shivani G. Khabale, Department of Civil Engineering, Pillai HOC College of Engineering and Technology, Rasayani, Dist. Raigad, Maharashtra, India. E-mail: khabaleshivani@gmail.com
Usha N. Mane, Department of Civil Engineering, Pillai HOC College of Engineering and Technology, Rasayani, Dist. Raigad, Maharashtra, India.
E-mail: ushamane8997@gmail.com
Dr. Anand. M. Hunashyal, Associate Professor, Department of Civil Engineering, Visvesvaraya Technological University, KLE Institute of Technology, Hubballi, Karnataka, India. E-mail: amhunashyal@bvb.edu

We may describe delay as an act or event that increases the time necessary for performing the tasks under a contract. This usually appears as additional working daysor as postponed to initiate an operation[14,31].This is often seen as a common problem in construction work[12]. According to Assaf et al (2006)[12]in construction industry, One can define delay as the 'Time Overrun' regarding two considerable conditions or situations, The first condition is delay beyond the date of completion laid down in the contract, second condition is delay beyond the date for which the involved parties agreed upon for delivery of a project. According to Kaliba C., M.M. (2009)[15], if project costs or schedules goes beyond their planned time period, client satisfaction would be trade off and the funding profile would failed to match the budget requirement and further slippage in schedule could results. Which further leads to costly disputes and shows many times adversely impact on relationships between the parties involved such as project stakeholders including owners, design professionals, construction professional, users and others.[8].In Saudi Arabia, Assaf and Al-Hejji2006[12] found that only 30% of construction projects are only projects which completed within the scheduled completion dates and along with it also found that average time overrun was between 10% and 30% regarding construction projects. Odeyinka and Yusif 1987 [2] have shown that seven out of ten projects surveyed in Nigeria goes through such delays in their execution of work. Ogunlana and Promkuntong 1996 [5] carried out a study on construction delay in Thailand. Al-Monmani 2000[8], conducted a quantitative analysis on construction delays in Jordan and

Now considering Indian conditions and situations, construction is the second largest economic activity after agriculture, accounting for between 6 and 9% of India's GDP over the past five years, while reporting an annual growth of 8 to 10% .On this basis of above mentioned observations, finally we can conclude the main problems that the project face while dealing with these delaying factors usually runs around the time; cost is being overused for the improvement of the site work. The main aim and purpose of this study is to develop and create a recommendation based on a subjective analysis of data obtained from different parties via different methods. An analysis was based on a different standpoints or views of professionals within the construction industry based on the different affecting factors causing the overall delays in the construction project.

The parties included in contract by means of representation decide on the additional capital and extra time associated with construction delay for different parties is different. While it may be unrealistic to believe that all causes of delay can be brought under control [7].

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The main task should be to define the parties responsible for the incident first.

Most of the time more than one party is responsible for the project delays, so multiple delays can occur simultaneously.

Hence, studying is necessary and analyses causes of delay. Like the one service provided by the infrastructure projects serves input for the other sectors, the cost overrun of this project leads to an increase in capital-output ratio for the economy as a whole. The research also focuses on the various delays affected by the topography of the site. Therefore, various projects have different reasons for the delays. The most common delays are solved by the people working on the site; this research also focuses on the ways with which the delays can be avoided on the site.

For the study, the coastal region of Mumbai has been selected. Being an economic hub and financial capital of India, it is important to study the problems that are faced by construction industry of Mumbai, which will further help us to understand the key factors that cause delay in the city's urban construction projects. Most of the projects in the study have huge capital investment as well as must fulfill the quality standards with also urgency for the execution of project on time. The study is expected to shed some light on the factors that causes the project to delay also to help the construction planners to understand the problems with a holistic view and get better grasp of the current scenario of the Mumbai's construction industry.

This paper is organized as follows, first to identification of the major causes of delay, effects of delay and further understanding actual means of minimizing construction delay situations regarding construction project work in coastal part of Mumbai.

II. METHODOLOGY

The methodology includes series of procedure followed from acquiring data to analyzing it (Fig.1).There are total number of 7 stages .i.e. Literature review, Preparation of questionnaire, identification of companies, survey of questionnaires, Data collection, Data Analysis, Suggestion and conclusion. The outcome from the literature review would assist in finding out 34 causes of delay which were suitable for the present study. These causes would be evaluated and divided into 8 different categories namely owner related, project related, contractor related, consultant related, Material related, equipment related, labor related and external factors. A questionnaire was prepared identify the rankings of delays faced on the construction site through Relative importance index as well as the inter-correlation of these eight different causes of delay would be obtained by Spearmen's co- relation .To support the hypothesis ANOVAs analysis was done.

Fig.1. Research Methodology

Questionnaire Survey:

To gather the data required for the study, a questionnaire survey was prepared and circulated within the professionals working on the construction site. The questionnaire consists of 34 causes of delays which were sorted as per contractor, owner and consultant as well as general delays faced on the construction site. The questionnaire was based on the scale of Likert's which ranged from 1-5. The scale is expressed in Very low input, small input, medium input, moderate input and very high input. The study involved a total of 27 participants. As listed in Table.1They were distributed as 8 consultants, 13 contractors and 7 owners.

Table.1: Causes of delay

Sr. No.	Causes of Delays	Groups
1	Legal disputes between various parties	Project
2	Effect of subsurface conditions	Project
3	Traffic control and restrictions at job site	Project
4	Unavailable of utilities in site	Project
5	Accident during construction	Project
6	Delay in decision making	Owner
7	Delay in progress payments by owner	Owner
8	Delay in delivering site to the contractor by the owner	Owner
9	Poor communication and co -ordination by owner& other parties	Owner
10	Late in approving documents by the owner	Owner
11	Delay in reviewing approving major changes in the scope of work by consultant	Consultant
12	Delay in performing inspections and testing by consultant	Consultant
13	Difficulties in financing project by contractor	Contractor

14	Poor site management and supervision	Contractor
15	Ineffective planning and scheduling of project	Contractor
16	Rework due to errors during construction	Contractor
17	Delay in sub contractor work	Contractor
18	Improper interpretations of contract terms and conditions by contractor	Contractor
19	Unclear and inadequate details in the drawings	Design
20	Mistakes and discrepancies in design documents or unclear drawings	Design
21	Delays in producing design documents	Design
22	Lack of understanding of requirements of client by the designing Engineer	Design
23	Shortage of construction materials	Materials
24	Delay in material delivery	Materials
25	Changes in specifications ad types of material during construction	Materials
26	Shortage of equipment and labor	Equipment and labor
27	Unavailability of workforce	Equipment and labor
28	Equipment failure	Equipment and labor
29	Labor fatigue	Equipment and labor
30	Environment restrictions	External Factors
31	Changes in government regulations and law	External Factors
32	Delay in performing final inspection and certification by third party	External Factors
33	Corruption	External Factors
34	Natural disaster (flood, landslides etc.)	External Factors

The effects of delays (Table.2) are on the construction site in general are listed .These are also based on Likert's scale ranging from 1 to 5. They are as follows: Never, Seldom, Sometimes, Mostly and Always.

Table.2: Effects delay

Sr. no.	Effects
1	Time over-run
2	Cost overrun
3	Arbitration
4	Total Abandonment
5	Dispute
6	Litigation

The report which focuses on the various methods those are followed and are effective in minimizing the impact of delays on the construction site. There are in total 11 methods listed in the questionnaire (Table.3). These questionnaires are also measured according to the Likert's scale, which ranges from 1 to 5. They are as follows: Very Low effective, Low effective, Medium Effective, High effective, and Very High effective

Table.3: Methods of delay

Sr. no.	Methods
1	Estimate initial project cost
2	Frequent site meeting with all parties
3	Proper utilization of modern construction technology
4	Effective strategic planning
5	Proper material procurement
6	Use of appropriate construction methods
7	Proper project planning and scheduling
8	Complete and proper design at right time
9	Site management and supervision
10	Collaborated working in construction
11	Compressing construction duration

III. ANALYSIS OF DATA

The analysis of data is done to sort out the various delays according to their importance index that contributes to causes, effects and methods to minimize it. Co-relation between the different factors is determined as well. Following were the various analysis methods used to identify the various delays affecting construction projects in coastal part of Mumbai.

1. Relative Importance Method (RII)
2. Spearmen's Co Relation Coefficient
3. ANOVA Analysis

Relative Importance Index:

Relative Importance index (RII) Method is used in the study to rank the causes of delays according to their importance Index. All the combine responses from the respondents such as owner, consultant & contractor were considered for the analysis. Following was the formula used to identify the importance Index.

$$RII = \frac{\Sigma W}{A*N} \quad \text{...............} (1)$$

Where,
RII = Relative Importance Index
W = Weighing given to each factor by the respondents (ranging from 1 to 5)
A = Highest weight (ie.5)
N = Total Number of respondent in the sample
The relationship of rank of the spearman was a non-parametric measure of statistical dependence between two variables. It offered a favorable position not requiring the assumption of typicality or homogeneity of the assumption of change. The subjects may be thought of, as the results may have a few outliers, their impact may be discredited. The formula for coefficient can be computed is as followed:

$$r = 1-[(6\Sigma d^2) / (n^3-n)]$$

Where,

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r = Spearman's rank correlation coefficient between two factors

d = difference of ranking between assigned to variables for each cause (owner and consultants, owner and contractors, consultant and contractors)

N = Number of pair rank A respectively.

ANOVA:

ANOVA is a parametric statistical test which is used to compare datasets. The method was invented by statistician R. Fisher in the year 1921 in this research paper title on the "Probable Error" of a Coefficient of Correlation Deduced from a Small Sample. ANOVA is often used to compare data to test for identification of significant differences among the variables.

ANOVA is a method to comparing average (mean) responses in controlled environments to experimental manipulations. ANOVA is used to test the working hypothesis which is proposed by the researcher and to test that whether or not the hypothesis or the guess is valid or not.

The opposite of working or null hypothesis is alternative hypothesis.

Analysis of data

A total number of 34 questionnaires were circulated among various construction professionals such as contractor, owner & consultant in coastal part of Mumbai. The data obtained from them were inserted into M.S. Excel sheet to organize as well as its statistical tool to find out the relative importance index of the cause of the delays, effects of construction delays and various methods used to avoid these construction delays faced on the site. The data accumulated and analyzed sheet is shown is illustrated in the fig 2& fig 3.

Fig 2: Data collection sheet

Causes of delays due to project:

By analyzing through relative importance index method it was established that legal disputes between different parties was the most cause of delay contributing in the project category .Unavailable of utilities ,traffic control and restrictions at Job Site, effect of subsurface condition, Accident during construction were the series followed forth on .

Table.4: Causes of delay due to project

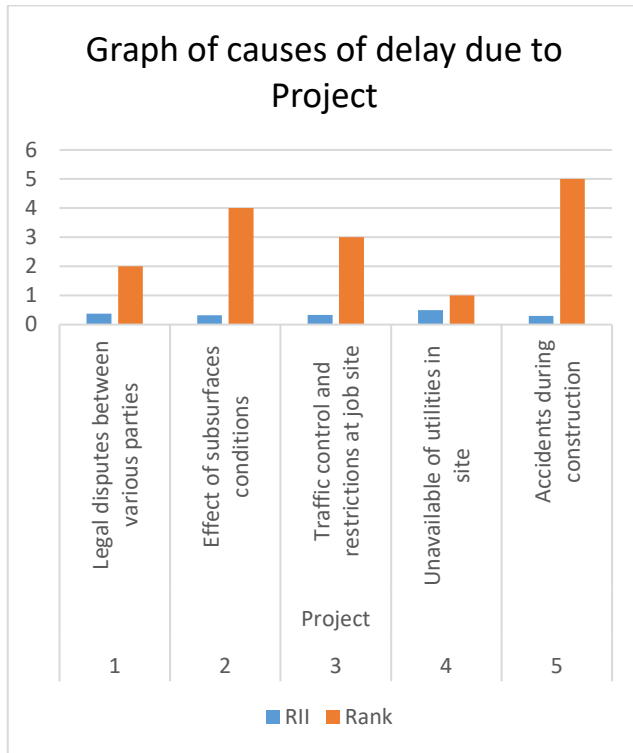| Sr. No.	Group	Causes	RII	Rank
1	Project	Legal disputes between various parties	0.376	2
2		Effect of subsurface conditions	0.324	4
3		Traffic control and restrictions at Job site	0.329	3
4		Unavailable of utilities in site	0.494	1
5		Accident during construction	0.3	5

Fig.3: Graph of causes of delay due to project

Causes of delay due to owner:

In that table **3** represents the result revealed of analysis of causes due to owner. The delays were ranked according to their relative important. It was shown that Delay in decision making was the most cause of delay contributing in that owner category. Followed by delay in progress payment by owner, Delays in delivering site to the contractor by the owner, poor communication, co-ordination by owner and other parties, Late in approving documents by the owner were the causes contributing causes of delay due to owner

Table.5: Causes of delay due to owner

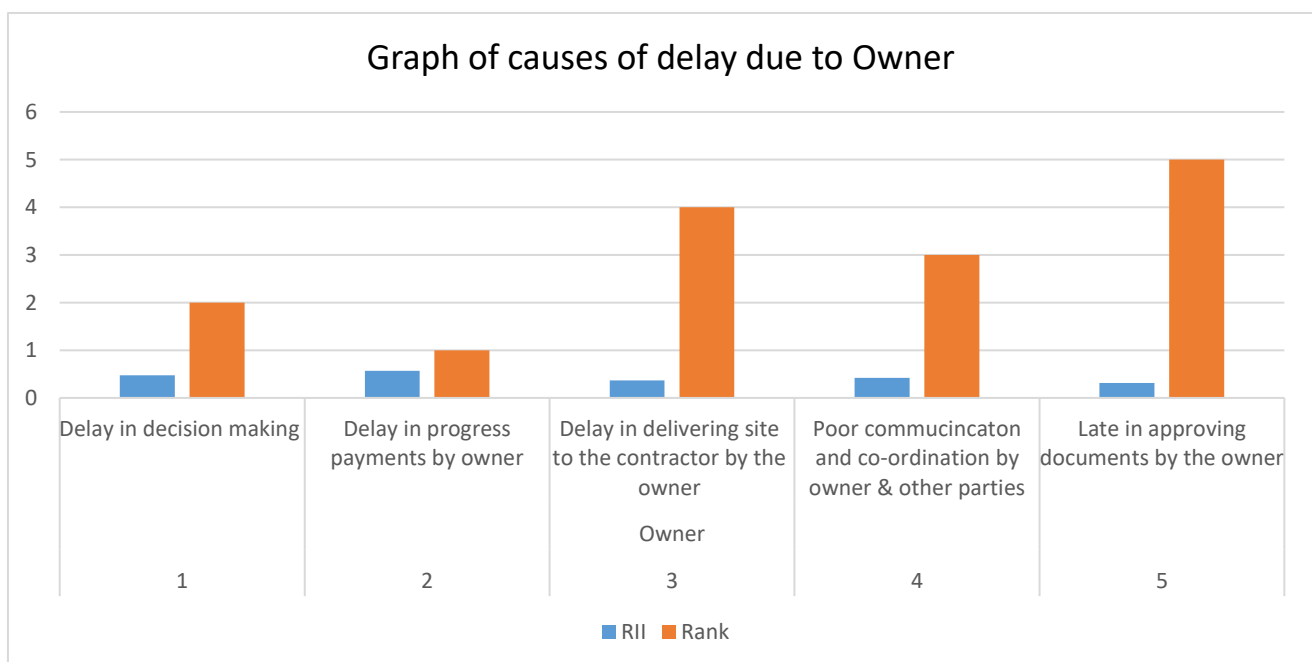| Sr. No.	Group	Causes	RII	Rank
1		Delay in decision making	0.476	2
2		Delay in progress payments by owner	0.571	1
3		Delay in delivering site to the contractor by the owner	0.365	4
4		Poor communication and co -ordination by owner& other parties	0.418	3
5	Owner	Late in approving documents by the owner	0.312	5

Fig.4: Graph of causes of delay due to owner

Causes of delay due to consultant

The Table no.6 represents the results revealed of survey analysis of causes of delay due to consultant.

The delays have been ranked

according to their relative importance index. The most cause of delay contributing in the consultant category are Delay in approval and major changes in the scope of the work of the consultant and delay in inspection and testing of the consultant.

Table.6: causes of delay due to consultant

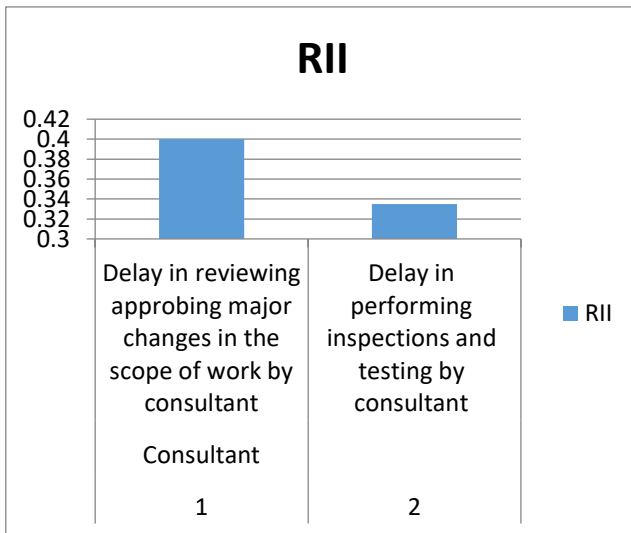| Sr. No.	Group	Causes	RII	Rank
1	Consultant	Delay in reviewing approving major changes in the scope of work by consultant	0.4	1
2		Delay in performing Inspections and Testing by consultant	0.335	2

Fig.5: Graph of causes of delay due to consultant

Causes of delay due to contractor

The Table no.7 represents the result of the analysis of the causes of delays in the contractor category. It showed that the most contributing cause of delay due to Contractor was difficulties in financing project by Contractor. It was followed by poor site management and supervision, Ineffective Eyes planning and scheduling of project, Rework due to errors during construction, Delay in sub- contractor work, Inadequate contractor experience, Improper construction methods implemented by contractor.

Table.7: Causes of delay due to contractor

| Sr. No.	Group	Causes	RII	Rank
1		Difficulties in financing project by contractor	0.488	1
2		Poor site management and supervision	0.376	2
3		Ineffective planning and scheduling of project	0.335	4
4		Rework due to errors during construction	0.324	5
5	Contractor	Delay in sub contractor work	0.359	3
6		Improper interpretations of contract terms and conditions by contractor	0.312	6
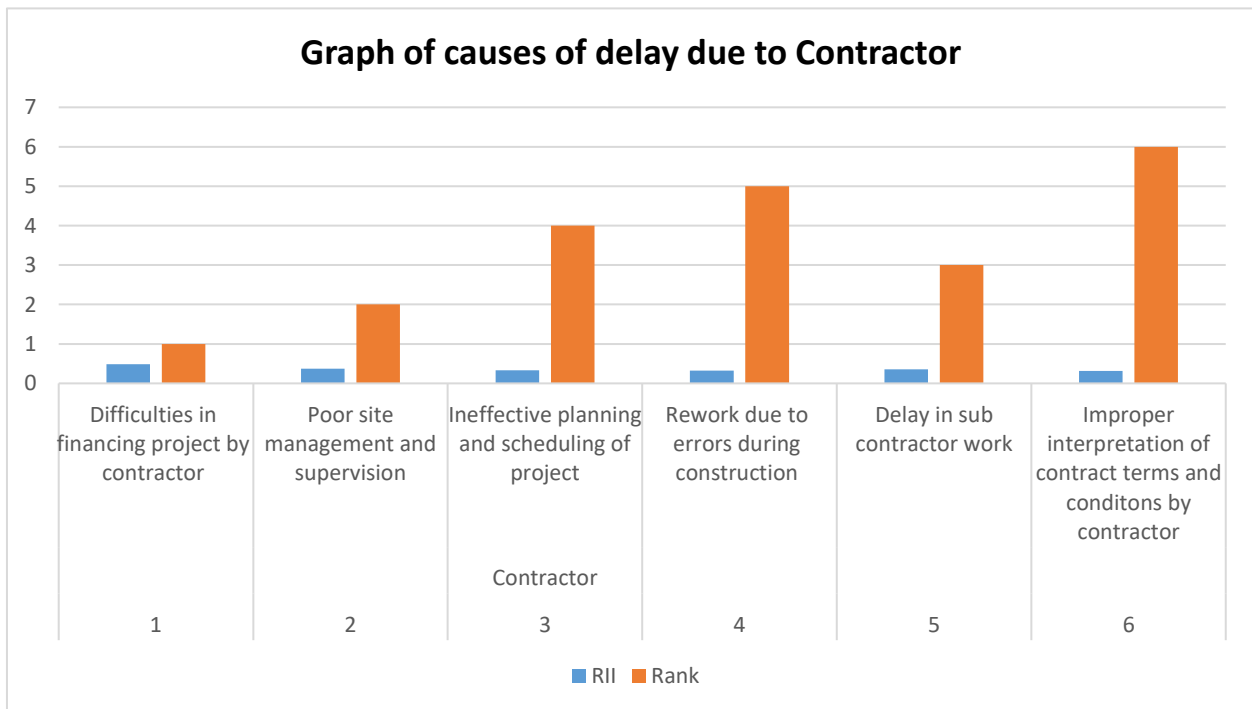
Fig.6: Causes of delay due to contractor

Causes of delay due to design:

The table no.8 represents the result of analysis of the causes of delays in the design category. It showed that Unclear and Inadequate details in the drawings were the most contributing cause of delay the design category whereas mistakes and discrepancies in design documents or Unclear drawings , Delay in producing design documents & Lack of understanding of requirements of client by the designing engineer were the series of causes of delays contributing the causes of delay.

Table.8: Causes of delay due to design

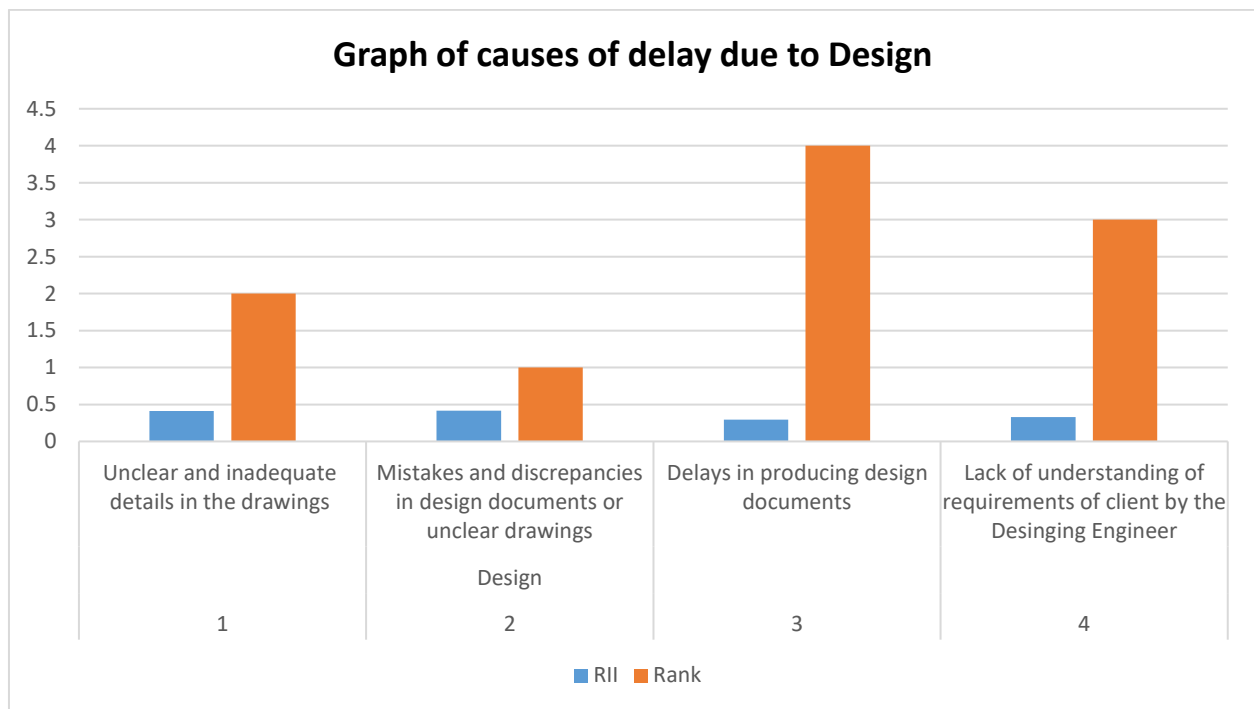| Sr. No.	Group	Causes	RII	Rank
1		Unclear and inadequate details in the drawings	0.412	2
2		Mistakes and discrepancies in design documents or unclear drawings	0.418	1
3	Design	Delays in producing design documents	0.294	4
4		Lack of understanding of requirements of client by the designing Engineer	0.329	3

Fig.7: Causes of delay due to design causes of delay due to design

The table no. 9 represents the result of the analysis of the causes of the delays due to materials. The results showed that Storage of construction materials was the most contributing cause of delay of the material group. Delay in material delivery as well as Changes in specification & types of materials during construction were the series of cause of delay in material group.

Table.9: Causes of Delay due to Material

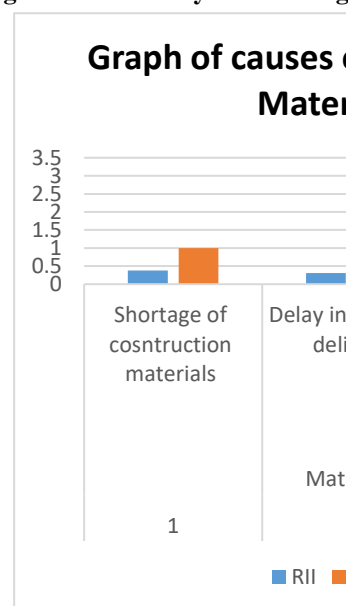| Sr. No.	Group	Causes	RII	Rank
1		Shortage of construction materials	0.376	1
2		Delay in material delivery	0.312	3
3	Materials	Changes in specifications and types of material during construction	0.365	2

Table.8: graph of causes of

delay due to material

Causes of delay due to equipment and labour:

The analysis of this data was done by relative importance index. Analyze and rank the causes of delays in equipment and the labor group. Therefore, it revealed that shortage of equipment and labor was the most affecting cause in the Equipment and labor group. As well as unavailability of workforce, equipment failure &labor fatigue were the series ranked according to the relative importance index.

Table.10: Causes of delay due to equipment and labor

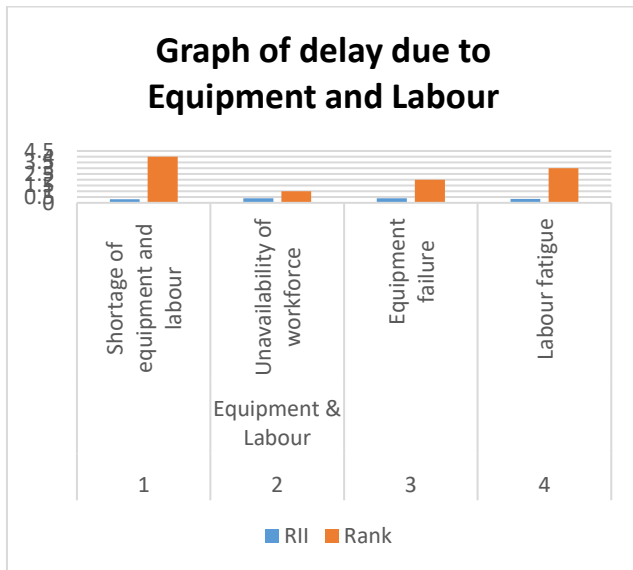| Sr. No.	Group	Causes	RII	Rank
1		Shortage of equipment and labor	0.312	4
2	Equipment and labor	Unavailability of workforce	0.394	1
3		Equipment failure	0.382	2
4		Labor fatigue	0.335	3

Fig.9: Graph of causes of delay due to equipment and labor

Causes of delay due to External Factor:

The data of this study revealed that Environment restrictions are the most affecting factor for the causes of delay due to external factors. Whereas corruption, changes in Government regulation, and Law as well as delay in performing final inspection by the third party were the next causes of delay affecting. Natural disaster was the least factor affecting the causes of delay in the external factor group.

Table.11: Causes of delay due to external factors

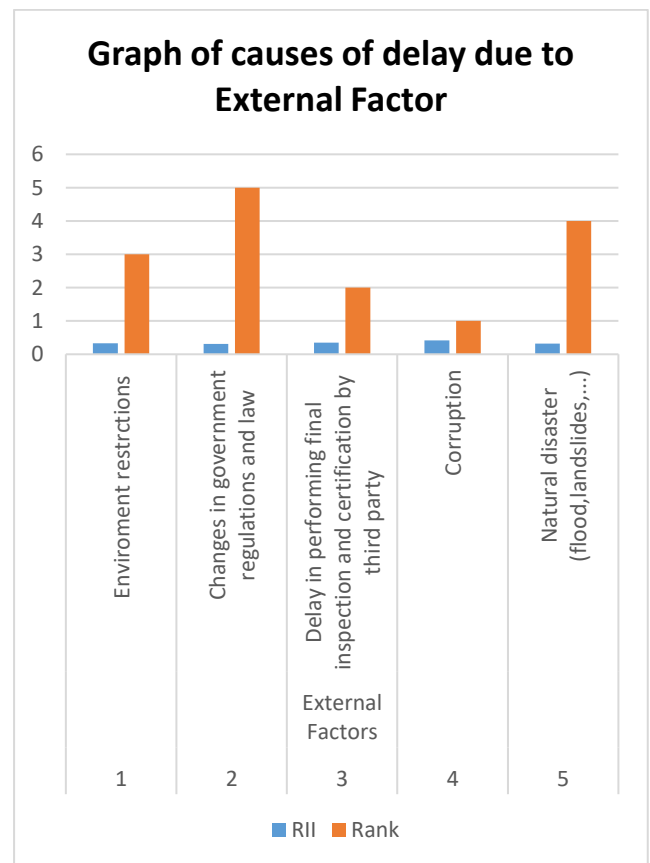| Sr. No.	Group	Causes	RII	Rank
1		Environment restrictions	0.329	3
2		Changes in Government regulations and Law	0.312	5
3	External Factors	Delay in performing final inspection and certification by third Party	0.347	2
4		Corruption	0.412	1
5		Natural disaster	0.318	4

Fig.10: Graph of causes of delay due to external factor

Ranking of Causes of delay:

As by the relative index analysis the rankings of each cause of delay as mentioned above are shown in the table below.

Table.12: Rankings of causes of delay

Sr. no	Causes of Delays	Rank
1	Delay in progress payments by owner	7
2	Unavailable of utilities in site	4

3	Difficulties in financing project by contractor	14
4	Delay in decision making	6
5	Poor communication and co -ordination by owner& other parties	9
6	Mistakes and discrepancies in design documents or unclear drawings	20
7	Unclear and inadequate details in the drawings	11
8	Corruption	33
9	Delay in reviewing approving major changes in the scope of work by consultant	12
10	Unavailability of workforce	27
11	Equipment failure	28
12	Legal disputes between various parties	1
13	Poor site management and supervision	15
14	Shortage of construction materials	23
15	Delay in delivering site to the contractor by the owner	8
16	Changes in specifications ad types of material during construction	25
17	Delay in sub contractor work	18
18	Delay in performing final inspection and certification by third party	32
19	Delay in performing inspections and testing by consultant	13
20	Ineffective planning and scheduling of project	16
21	Labor fatigue	29
22	Traffic control and restrictions at job site	3
23	Lack of understanding of requirements of client by the designing Engineer	22
24	Environment restrictions	30
25	Effect of subsurface conditions	2
26	Rework due to errors during construction	17
27	Natural disaster (flood, landslides etc.)	34
28	Late in approving documents by the owner	10
29	Improper interpretations of contract terms and conditions by contractor	19
30	Delay in material delivery	24
31	Shortage of equipment and labor	26

Effects of construction Delays:

The questionnaire survey assist in identifying the effects of construction delays according to the five general factors i.e. cost overrun , time overrun , litigation, arbitration & total abandonment. The effects are ranked according to their relative importance. The questionnaire survey was circulated among various professionals working on the site such as contractor, owner and consultant. Their holistic view about the effects of delays was collected for the data. Therefore it was revealed according to the analysis, following are the six factors ranked according to their importance index. cost overrun is the ranked the most affected factor by the delay. Whereas time overrun, dispute, litigation, Arbitration and Total abandonment are the series of effected ranked

Table.13:Effects of Delay

Sr. No.	Effects	Rank
1.	Cost Overrun	1
2.	Time Overrun	2
3.	Dispute	3
4.	Litigation	4
5.	Arbitration	5
6.	Total abandonment	6

Methods of minimising Construction delays:

The below table shows the result of the analysis to identify the various general methods that are can assist in avoiding the construction delays. The analysis is done by relative importance method.

Table.14: Methods to minimize causes of effects of delay

Sr. no.	Methods	RII	Rank
1	Estimate initial project cost	0.694	5
2	Frequent site meeting with all parties	0.682	6
3	Proper utilization of modern construction technology	0.606	9
4	Effective strategic planning	0.712	4
5	Proper material procurement	0.641	8
6	Use of appropriate construction methods	0.735	3
7	Proper project planning and scheduling	0.747	1
8	Complete and proper design at right time	0.659	7
9	Site management and supervision	0.741	2

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10	Collaborated working in construction	0.524	10
11	Compressing construction duration	0.482	11

The results of the analysis showed that there was a co-relationship between the contractor and the owner of the del ay factors,contractor and consultant & owner and consultant are **0.90**, **0.93** and**0.85** respectively. It revealed that there was a high co relation related to delay factors between the parties involved.

Table.15: Spearman's rank correlation coefficient

Sr. No.	Description	Rank Co-relation Co-efficient
1.	Contractor and Owner	0.90
2.	Contractor and Consultant	0.93
3.	Owner and Consultant	0.85

Fig.11: Spearman's rank correlation coefficient analysis

Fig.12: ANOVA analysis

IV. RESULTS AND DISCUSSION

The analysis of the report showed the co relation co efficient between owner and contractor, consultant and owner as well as contractor and consultant are 0.90, 0.85 and 0.93. The co relation of the responses contributed revealed that all the professionals involved had similar opinions about the causes of delay in the construction project in the coastal part of Mumbai. By the Spearman's correlation and coefficient analysis following fig. showed the top 7 important causes of delay.

Table.16: Spearman's correlation coefficient

Sr.No.	Causes of delay	Contractor	Owner	Consultant
1.	Ineffective planning and scheduling of project	17	32	16
2.	Delay in decision making	4	8	3
3.	Delay in material delivery	33	12	34
4.	Changes in government regulations and law	27	26	25
5.	Delay in delivering site to the contractor by owner	21	10	11
6.	Accident during construction	31	30	22
7.	Unavailable of utilities on site	3	7	2
8.	Mistakes and discrepancies in design documents or unclear drawings	9	6	8

To promote the analysis, Analysis of Variance (ANOVA) is done to find out the variance and compare it with the results from the above method. In the fig 1 and 2 showed the result from the analysis method.

	RII (Contractor)	RII (Consultant)	Correlation OC	Correlation CONO		Correlation CCON	
	C	D	E	F	G	H	I
ANOVA							
Source of Variation	SS	df	MS	F	P-value	F crit	
Between Groups	367.030425963465	28	13.108229	12.769927	0.0000000	1.4881466	
Within Groups	982.35294117647	957	1.0264921				
Total	1349.38336713994	985					

Fig.13: Analysis of ANOVA (One Way Method)

	RII (Contractor)		RII (Consultant)		Correlation OC		Correlation CONO		Correlation CCON		Anova Full	
L	M	N	O	P	Q	R	S	T	U	V	W	
				4	33	47	1.4242424	0.6268939				
				3	33	44	1.3333333	0.5416666				
				3	33	70	2.1212121	1.2973484				
				3	33	72	2.1818181	0.8409090				
				4	33	81	2.4545454	1.5681818				
				2	33	74	2.2424242	1.2518939				
				4	33	69	2.0909090	1.5852272				

ANOVA						
Source of Varia	SS	df	MS	F	P-value	F crit
Rows	93.106060	32	2.9095643	3.1763185	0.0000000	1.4570770
Columns	361.88203	27	13.403038	14.631853	0.0000000	1.4986613
Error	791.43939	864	0.9160178			
Total	1246.4274	923				

Fig.14: Analysis of ANOVA (Two Way Method)

By comparing the two analyzes, in Table 17, the causes of delay were repetitive in both methods, thus identifying the most important causes of delay in the sample.

Table.17: Comparison of Spearman's Correlation coefficient & ANOVA

Sr.No.	Causes of Delay	Spearman correlation coefficient	ANOVA
1.	Ineffective planning and scheduling of project	√	√
2.	Delay in decision making	√	√
3.	Delay in material delivery	√	√
4.	Change in government regulations and law	√	√
5.	Delay in delivering site to the contractor by the owner	√	√
6.	Accident during construction	√	
7.	Delays in producing design documents	-	√
8.	Unavailable of utilities on site	√	√
9.	Corruption	-	√
10.	Equipment failure	-	√
11.	Poor site management and supervision	-	√
12.	Labor fatigue	-	√
13.	Effect of subsurface conditions	-	√
14.	Mistakes and discrepancies in design documents or unclear drawings	√	√

The analysis of result showed that Ineffective planning, Delay in decision making, Delay in material delivery, changes in government regulations and law, delay in delivering site to the contractor by the owner, Unavailable of utilities in site, stake discrepancies in design documents or unclear drawings are the most repetitive and most contributing cause of delay in construction project for coastal part of Mumbai. The analysis of the sample is done with some limitations set in mind. The results of the report may vary from one construction project to another.

Methods to minimise construction delay:

To minimize the impact of construction delay in analysis of the report identified top 10 methods ranked according to relative importance index. It showed that proper project planning and scheduling is the top ranked method in the report. Whereas site management and supervision, use of appropriate construction method and effective strategic planning are ranked in the top 5 as well.

Table 18: Rank of Methods

Sl. No.	Methods	Rank
1	Proper project planning and scheduling	1
2	Site management and supervision	2
3	Use of appropriate construction methods	3
4	Effective strategic planning	4
5	Estimate initial project cost	5
6	Frequent site meeting with all parties	6
7	Complete and proper design at right time	7
8	Proper material procurement	8

9	Proper utilization of modern construction technology	9
10	Collaborated working in construction	10

V. CONCLUSION

The study concluded that to minimize the impact of delay in the construction project in coastal part of Mumbai certain protocols should be followed to ensure that the construction project should run without any delay. The results from the analysis revealed top 5 major causes of delay according to Relative Importance Index (RII) which are Legal disputes between various parties, Effect of subsurface condition ,Traffic control and restriction at job site , unable to use utilities on site, Accident during construction. The top 3 major effects from the delays are time overrun, cost overrun & dispute between various parties. To overcome the delays on the site methods such as proper planning and scheduling of project, Site management and supervision, use of appropriate construction method, Effective strategic planning & Estimate initial project cause are the highest ranked method according to the analysis done. To support the analysis, comparison of the analysis method with different analysis method (Spearman's correlation Coefficient & ANOVA) is done. The result from the comparison stated that inefficient planning and scheduling of the project, delay in decision making, Delay in material delivery, changes in government regulations and law and delay in delivering site of the contractor by the owner, Unavailable of utilities in site& Mistakes and discrepancies In design documents or unclear drawings are the major causes of delays faced on the site. The spearman's co relation results give us sig. association between two factors. Whereas, ANOVA gives sig. difference among the mean of two factors. Therefore the data obtained from the ANOVA analysis is far more accurate than the data obtained from the Spearman's correlation coefficient. The report should be considered by considering limitations in mind. The results obtained from the analysis of the study showed that dissertation would help project managers and owners to keep careful recordof the project by looking at factors with high level of project indices. Institutions should have the criteria of having "construction management" as formal qualifications for anyone working a s a project manager on the construction site.

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AUTHORS PROFILE

Sandeep V. Gujjar, is currently pursuing PhD from Visvesvaraya Technological University, Karnataka and working as an Assistant Professor in Department of Civil Engineering, Pillai HOC College of Engineering and Technology, Rasayani, Dist. Raigad - 410207, Maharashtra, India. He has published books related to civil engineering, research papers, filed patents related to nano composite coating which enhances mechanical and anticorrosive properties of mild steel. He has guided several students pursuing post graduate and under graduate students for research work in civil engineering. He has more than 11 years of teaching, industry and research experience in Indian and international organization.
Ph: 8793169868, E-mail: sandeep.gujjar@rediffmail.com

Soham Sawant, is a graduate in Civil and infrastructure Engineering from Rustomjee Academy for Global Careers, Dahanu road (E) - 401602, Maharashtra, India affiliated to University of Wolverhampton, UK. Ph: 8369889981, E-mail: Scotsoham23@gmail.com

Ashish Kulkarni, is presently pursuing post graduation in Construction project management from Pillai HOC College of Engineering and Technology, Rasayani, Dist.Raigad-410207, Maharashtra, India. Presently working on research area of construction project management topic for his dissertation. He has done internships in reputed civil engineering organization and also completed many software courses related to civil engineering. Ph: 7721816718, E-mail: officialashish2996@gmail.com

Chaitali R., Kulkarni is presently pursuing graduation in Civil Engineering from Pillai HOC College of Engineering and Technology, Rasayani, Dist.Raigad-410207, Maharashtra, India. Presently working on research area of construction management and nano composite which enhances mechanical and anticorrosive properties of mild steel. She has done her internships in reputed civil engineering organization and also completed many software courses related to civil engineering. Ph: 8291706206,
E-mail: 16chaitalik@gmail.com

Shivani G. Khabale, is presently pursuing graduation in Civil Engineering from Pillai HOC College of Engineering and Technology, Rasayani, Dist.Raigad-410207, Maharashtra, India. Presently working on research area of construction management and nano composite which enhances mechanical and anticorrosive properties of mild steel. She has done her internships in reputed civil engineering organization and also completed many software courses related to civil engineering. Ph: 9867758666,
E-mail: khabaleshivani@gmail.com

Usha N. Mane, is presently pursuing graduation in Civil Engineering from Pillai HOC College of Engineering and Technology, Rasayani, Dist.Raigad-410207, Maharashtra, India. Presently working on research area of construction management and nano composite which enhances mechanical and anticorrosive properties of mild steel. She has done her internships in reputed civil engineering organization and also completed many software courses related to civil engineering. Ph: 9975267301
E-mail: ushamane8997@gmail.com

Dr. Anand. M. Hunashyal, is presently working as an Associate Professor in the Department of Civil Engineering, Visvesvaraya Technological University, KLE Institute of Technology, Hubballi-580021, Karnataka, India. He has completed his P.hD from Visvesvaraya Technological University, Karnataka, India. He has published various research papers civil and mechanical engineering, filed and awarded patents related to nano composite coatings which enhance mechanical and anticorrosive properties of mild steel and many more. He is guiding several students pursuing doctorate, post graduate and under graduate students for research work in civil engineering. He has more than 20 years of teaching and research experience. Ph:9739192399, E-mail: amhunashyal@bvb.edu.