Study of Delay Analysis in Residential Building Project Fuzzy Approach Questionnaire Survey

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Abstract – Due to the existing risks and growing difficulties of modern construction projects, industrial delays and overspending have become commonplace. Researchers and physicians have used a number of methods to assess the cost of project delays and fear of delays between participating organizations. Basic delay analysis is considered to be one of the most reliable methods of analyzing construction delays. In addition to its benefits, survey analysis can yield different results depending on the amount of data collected, which can be considered as employer and contractor development, as well as the impact of multiple infrastructure upgrades resulting from changes in real-time and working relationships. , And the impact of development events on resource allocation can be considered and delayed as a result. This study raises the basis for an experimental basis for analytical models that can look at a number of factors affecting construction delays. In this work we have developed a basic waiting system and recommendations, which can look at many of the items included in the interview. Finally, the program recommends a variety of common factors that cause delays in the graph. Integrated research applies to any type of construction project.

Keywords – Delay Analysis, Construction Delay, Factors and Fuzzy Base Weighting.

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1.   INTRODUCTION

The main concern of the problems that exist in this work is associated with the identification of the reasons why the delay in the construction process is easier. It has been found that there are certain types of delay problems that are associated with a project. It is important for the employee to indicate the reasons for the delay and to determine the effect of the delay in the Indian construction industry. In addition, it is not possible to find out what kind of problems with project managers while construction is underway as some of the issues arise in an unexpected way. The work story is associated with the gathering of evidence and features through intensive work and data collection from a few case studies.

Delays in construction work are bad because it is not easy to compile reasons for delays in a major construction project in India. However, the nature of the work delay is different for different projects. In some cases, it is associated with undue delays that completely emphasize contractor negligence and poor site management or equipment violations. In addition, some delays are associated with simultaneous delays associated with multiple types of reductions. Therefore, the task may be challenging in data collection by providing equally per study.

This work will cover a wide range of key issues in the construction industry leading to delays in work. This existing work will enlighten us on the various problems of delays that can be raised in the construction process. In addition, it will help the student to gain knowledge of the type of possible delays from construction. In addition, the outcome of the work could raise awareness among government and project managers to address the potential for delays in long-term expansion limits. In addition, this project will help the construction project manager and contractor to understand areas that contribute to improving construction-related costs. In addition, it helps to develop an effective risk management approach that can reduce the risk of project delays.

Their individual contribution to total delay delays was assessed and the level of symptoms according to their number as seen by respondents was performed using a fuzzy relative calculated using the equation and the results of the analysis are presented in practice. To determine the level of variability from the perspective of a contractor and advisers, fuzzy is calculated using the Equizzy Equation. For all the delay items and groups calculated using the fuzzy equation. References were calculated for clients, contractors and

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consultants. A group indicator is a measure of the delays in each group.

1.1 OBJECTIVES OF THE STUDY

main purpose of this current study is to find out the causes and effects of delays in the Indian Construction Area. In addition, it will highlight the subsequent effect on other fields related to this field.

The following objectives for the project are as follows

- To study the impact of delays on construction projects and understand the implications of delays based on data collected from various sites

- Resource identification has resulted in delays in construction

- Performing processing of delays using a blurring process

2. METHODOLOGY

The data collected to find the most powerful causes in project management was conducted through a survey of questionnaires that interviewed the respondents involved in the day-to-day operations of construction companies in various regions of the Gujarat region of India. The questionnaire is designed to allow respondents to rate their answers based on their own ideas. Analysis of this data was done in a form called (FUZZY). In this, various work processes, paradigm, method, and designs have been discussed with relevant details and arguments. Based on the availability of the books the employee has selected work structures that provide support for the consideration of the methods followed by the other employee. In addition, throughout the discussion, the rationale for selecting appropriate work strategies has been identified and is fully supported by the project flow patterns and flow chart.

- First, we analyze the background research on the scope and challenges facing the construction industry now.

- Next analyze the current state of the construction industry.

- Analyze policy applied by the public sector.

- Then find the causes of construction delays.

- Change the activation process.

- Finally find the impact and analysis after the change.

2.1 PROBLEM STATEMENT

What are the various causes of delays in the construction of a residential construction project and how it can be mitigated using the Critical Relative Index (FUZZY) process. Many Residential building projects have faced various difficulties and disruption of time is one of the major difficulties. Delays in non-compliance refunds have many assets as they will provide assistance to the link between the owner and the employees. In addition, it will also contribute to the scale and excess of the section. It is often said that the language of the bond is difficult to understand and is therefore a major source of diversity.

3. DATA COLLECTION

The data collection in this process is based primarily on human resources that help to clarify job issues and link job objectives (Tran, 2016). Basic data is said to be included in the collection of ideas that take account of it as a result of real-time analysis of causes after delays in the construction industry. In addition, primaries are associated with measurement data as well as measurement data analysis. In the present work, mass analysis of data is not possible as the collection process is associated with a larger sample size and helps to create graphical presentations. However, in this case, the sample size is only five managers for a separate Indian construction work. Therefore, the development of numerical data is not possible in the event of this operation. Relevant information is available in the standard response format available from the samples in a descriptive way. In the case of a suitable job, the employee strives to meet with respondents in order to obtain direct data.

3.1 QUESTIONNAIRE SURVEY

A structured discussion was organized by the work of the managers of various construction projects in India who faced delays in the continuation of construction work. Project managers are building technology experts and are involved in dealing with a variety of problems in the field of project that stops construction work. Therefore, the project has selected managers as they can provide relevant information about the causes and effects of the reduction of delays in the construction industry. For this to happen, the worker has prepared a set of relevant questions that help to gather the respondent's response in a descriptive way and assist in a detailed analysis process. Therefore, the design of the survey questionnaire can produce valid work data.

3.2 QUESTIONNAIRE STRUCTURE

The questions are structured based on their purpose and objectives in order to present a better

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job description. Depending on the job you are doing the job has created the following questions for you and you are aiming for the potential result.

Q1. What are the external factors that have affected the construction project?

Q2. What are the internal factors that have been affected the project?

Q3. What are the costs of delays in the construction industry?

Q4. What is the mitigation of delays in the construction industry?

Q5. According to you what are the possible impacts of delay in the construction industry?

3.4 QUESTIONNAIRE DISTRIBUTION

Distribution of questionnaires is a very important part of the job. As proper collection of responses is essential to proper job analysis that can lead to the correct conclusion of the task. The employee has distributed a list of questions to the respondent's managers in an email. In addition, the project has organized telephone interviews with construction project managers from VTP Urban Next, Suvidha Nisarga and Colori Phase-2. Distribution of the job questionnaire via email will help responders to judge the job question before a telephone conversation. In addition, it will help the system to collect significant causes of delays and estimates that construction work has enabled during the construction phase. Prior to the start of the discussion, it is important for the employee to verify the identification of respondents.

3.5 ANALYSIS OF COLLECTED DATA

Collected responses and findings of case studies are organized by the employee. Since most of the tasks received are in line with the described findings of the respondents it has been helpful for the task to organize the items according to the respondent's findings. After the commencement of the planning of the causal factors that the delay in the construction process assisted in the work of analyzing the impact of the delay in the construction industry. The effectiveness of the analysis is combined with the appropriate connection of the findings and the understanding of the concept built into the review section of the literature.

3.6 FACTORS TO BE ASSESSED

Case studies and questionnaires analyzed the findings presented in the table above. Elements deal with construction project delays. Delays in the project also develop an idea about the use of risk reduction associated with the delay process. Empowers managers to maintain a risk assessment process for

a construction project. Analysis of the case studies above associated with the process of delayed by qualified building managers reduces the risk so that another problem does not arise. Also included is the construction of cost-related problems in the completion of construction which includes unnecessary increases in costs associated with purchases and equipment. By collecting key data collection, use a set of specific questions, which contain specific questions and all respondent features will provide the rating as given in the details below.

1- Strongly Disagree

2- Disagree

3- Partially agree

4- Agreed

5- Strongly agreed

Causes of Delays		Weight
Client Related Factor	Finance and payments of completed work.	
	Owner interference.	
	Slow decision making.	
	Unrealistic contract duration and requirements imposed.	
	Obtaining permits from municipality.	
Consultant Related Factor	Contract management	
	Preparation and approval of drawings.	
	Quality assurance.	
	Waiting time for approval of drawings.	
Contractor Related Factor	Sub-contractor.	
	Site management.	
	Construction methods.	
	Preparation and approval of drawings.	
	Mistakes during construction stage.	
	Inadequate contractor experience.	
	Mistakes in preliminary stage (soil investigation).	
	Financing by contractor during	

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	construction.	
Material Factor	Quality in material.	
	Shortage in material.	
Labour and Equipment Related Factor	Labour supply.	
	Labour productivity.	
	Equipment availability and failure	
Contract Related Factor	Change orders.	
	Mistakes and discrepancies in contract document	
Contract	Major disputes and negotiations.	

4. DATA COLLECTION FROM DIFFERENT SITES

4 .1 Name of Project: COLORI Phase-2

The first place I checked was selected by Amit Enterprise Color Phase 2 in Andari (41,606) in Pune. There are two structures (H, I) that are delayed and therefore considered to be examined. Buildings G + 12 floor front 9M and 12M stand. The project includes 288 flats approximately 1 bhk (520 sq ft), 2 bhk (840 sq ft), in 12 shops.

shops.

4.2 Name of Project: VTP Urban Next

Another place I studied was the name of the NTPAYA Group VTP Urban Next, based in Pisoli, Pune. The project has eight structures (A1, A2, A3, B1, B2, B3, C1, C2). Buildings G + 11, 20M front margin and 20M rear rear. It has 462 flats 2 bhk (820 sq ft), 3 bhk (1100 sq ft), in 80 stores.

4.3 Name of Project : Suvidha Nisarga

The third place I learned was Nishirga in Khed Shivpur in Pune. The buildings have a 3m front row and a 3m back row. The project includes G + 5 buildings with 36 rooms. 1 bhk (610 sq ft), 2 bhk (870 sq ft).

The RII method is used to calculate the most important factor due to the delay. The test form has a rating of 1 to 5. Represented by statistics,

$$RII = \sum W \div (A*N)$$

Where,

W = weight assigned by the respondents for each factor (1 to 5)

A = maximum weight (i.e. 5 in this case)

Answer = Number of respondents. The higher the RII value, the more important the delay.

5. OVERVIEW OF FINDINGS

The following results are obtained after analyzing Site-1 (Color Phase-2): Major delays caused by Site-1 are customer related factors.

Table No. 1 Major delay causing factors for Site-1

Client Related Factors / Respondents	Project Manager	Planning Engineer	Site Engineer	Labour	RII
Finance and payments of completed work	3	2	3	4	0.60
Owner interference	3	4	1	5	0.65
Slow decision making	4	5	5	5	0.95
Unrealistic contract duration and requirements imposed.	5	5	5	5	1
Obtaining permits from municipality	4	5	4	2	0.75

After analysing site- 2 (VTP Urban Next) following results are obtained: Major delay causing factors are Contract Related Factors.

Table No. 2 Major delay causing factors Site 2

Contractor Related Factors/ Respondents	Project Manager	Planning Engineer	Site Engineer	Site Supervisor	RII
Sub-Contractor	4	3	4	5	0.80
Site management	1	4	5	5	0.75
Construction methods	1	3	2	3	0.45
Preparation and approval of drawings	4	5	4	3	0.80
Mistakes during construction stage	5	4	3	3	0.75
Inadequate contractor Experience	5	5	4	4	0.90
Mistakes in preliminary stage (Soil investigation)	5	5	4	5	0.95
Financing by contractor during construction	5	5	5	5	1

After analysing Site-3 following results are obtained: Major delay causing factors are Material Related Factors and Labour Equipment Factors.

Table No. 3 Major delay causing factors Site 3

Material Related and Labour Equipment Factors/ Respondents	Project Manager	Planning Engineer	Site Engineer	Site Supervisor	RII
Quality in material	4	3	4	4	0.74
Shortage in material	5	5	5	5	1
Labour supply	5	5	5	3	0.90
Labour Productivity	3	4	2	3	0.60
Equipment availability and failure	4	3	3	5	0.75

6. RESULTS

Collected responses and findings of case studies are organized by the employee. Since most of the

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tasks received are in line with the described findings of the respondents it has been helpful for the task to organize the items according to the respondent's findings. After the commencement of the planning of the causal factors that the delay in the construction process assisted in the work of analyzing the impact of the delay in the construction industry.

In a construction project where time is really worth the money, time management is important, so predicting schedule delays can play a big role in project success. Of the seventy-six factors that cause delays, the ten most important factors have been identified: contractor and other external factors, time-related issues related to delays. The FUZZY method uses data collected from the core and calculates the weight of each element. Subsequently major effects of the delay were identified on the basis of FUZZY weight. Status is created to identify the upper and lower extremities. The points below were obtained by performing this work.

Collected responses and findings of case studies are organized by the employee. Since most of the tasks received are in line with the described findings of the respondents it has been helpful for the task to organize the items according to the respondent's findings. After the commencement of the planning of the causal factors that the delay in the construction process assisted in the work of analyzing the impact of the delay in the construction industry.

• Significant delay of site -1 predicts the duration of the irrational contract as it has a very high RII value.

• Significant delays in Site2 result in contract deficits during construction as RII represents the highest value.

• Significant site-delay delays resulting in a shortage of material providing the highest RII value.

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