



A Review Paper on Analysis of Time Overrun in Indian Transportation Infrastructure Projects with Special Reference to Road Projects

Gayatri Kulkarni^a, Aarti Sarada^b, Aarti Korake^c, Shweta Koli^d, Shifa Mujawar^e

^{a to e} Students of Civil Engineering Department

D.K.T.E.Society's Textile and Engineering Institute, Ichalkaranji, Maharashtra-416115

ABSTRACT

This Study investigates time delay and cost overrun of Indian Transportation Infrastructure construction projects in India by means of quantitative and qualitative analysis. The qualitative analysis involves the identification of factors causing time delay and cost overrun of Indian Transportation Infrastructure construction projects in India through literature survey and by seeking the opinion of experts in the field of construction of Indian Transportation Infrastructure. The quantitative analysis was carried out to develop empirical models and to predict the quantum of time delay and cost overrun of Indian transportation Infrastructure construction projects in India. In order to develop models, data pertaining to 81 Indian Transportation Infrastructure construction projects completed between the year 2005 and 2015 were collected and were segregated into the projects that had undergone land acquisition and shifting of utilities and the projects that did not involve land acquisition and shifting of utilities. Multiple regression analysis technique was used to develop empirical models for predicting time delay and cost overrun of Indian transportation Infrastructure construction projects in India.

Keywords: Indian Transportation Infrastructures, Time delay

1. Introduction

The construction industry is a tool through which a society achieves its goals of urban and rural development. Roads are important mode of transport in India having one of the largest road networks across the world. Spanning over total 5.89 million km. of roads. This road network transports 69% of all goods in country and 90% of India's total passenger traffic uses roads network to commute. Road transportation has gradually increased over years with improvement in connectivity between cities, town and villages in country. The construction industry is one of the main sectors that provides important ingredients for development of economy. However, many projects experience delays and thereby exceed initial time and cost estimate. The factors which cause delays in construction projects also have an effect on overall project. Time overrun cost overrun total abandonment disputes and arbitration are main effects of project delays in construction industry. It is very important to systematically analyze the factors of delays and to build up a concise understanding amongst the highway and expressway professionals.

2. Relevance

Infrastructure projects are major drivers of economic growth of India. The industry's growth is deterred by poor project management practices leading to time delays, resource shortages and cost overruns. Delay reasons in infrastructure projects; their classification and their types are important to find out their implications. The delays occurring in a project can be classified into number of types depending upon the stages at which it occurs as well as on the nature of outcome. Completing projects on time is an indicator of efficiency, but the construction process is subject to many variables and unpredictable factors, which result from many sources. However, it is rarely happening that a project is completed within the specified time. One of the most common problems in the construction project is delays. Delays of a construction project can be defined as the late completion of works as compared to the planned schedule or contract schedule. Projects can be delayed due to number of reasons that may be due to the client, the contractor, acts of God, or a third party. They may occur early or later in the project development, alone, or with other delays. Delays can be minimized only when their cause are identified.

3. Different methods used for study:

I. Questionnaire survey:

Primary data collection and secondary data collection on in primary data collection included collection of information from personal

investigation questionnaire survey, interviews of various respondents. In the secondary data collection, data is collected from already published, analysed work of their researchers or people. [1], [2].

II. Severity index method:

Data were gathered through a survey and analysed by using a severity index, taking in view contractor and consultants. Agreement on the ranking of the severity of the causes of delay between the contractors and consultants was also tested. Recommendations for minimizing delay in construction projects were emphasized in view of the results of the study. [3]

A) Ranking of delay causes: -

$$\text{Severity index (\%)} = \sum a(n/N) * (100/5)$$

Where,

a = Constant expressing weighting given to each response, which ranges from 0 for no influence up to 5 for very high;

n=Frequency of the responses;

N=Total number of responses;

$$\text{Group severity index (\%)} = \sum_{i=1}^n Xi/n$$

Where,

X_i = Severity index of causes i under the group;

n = Number of causes under the group.

B) Rank correction: -

Spearman rank correction

$$r_s = 1 - [6 * \sum d^2 / (n^3 - n)]$$

Where,

r_s = Spearman rank correlation coefficient between two parties.

d = Difference between ranks assigned to variables for each cause;

n = number of pairs of rank.

III. Non-experimental, non –cross-sectional and explanatory study.

The general characteristics of the design methodology are Non-experimental, non –cross-sectional and explanatory study.

IV. Relative Importance Index:

Data analysis of the questionnaire is to find out the importance of each cause of construction delay, its effects on the construction and the possible ways to minimize the construction delay. The analysis of the data obtained is done by using index points as relative importance index(RII).Data consists of the following[1].

A.Calculation of relative importance index of each cause –

Relative Importance Index (RII) is calculated by using following formula as,

$$RII = \frac{\sum W}{A * N}$$

Where ,

RII = Relative Importance Index.

W = weight given to each cause by respondents.

A = Highest weight.

N = Total number of respondents.

B.Ranking of causes of delay depending upon relative importance index (RII).

4. Conclusion:

In this study of review paper, we got to know about different methods used for study of delay in projects. The different methods used are Questionnaire survey, Severity index method, Non-experimental, non –cross-sectional and explanatory study, Relative Importance Index method. Delays are one of the major problems faced by road construction projects. Thus, the review of causes of delay and their sources in this type of projects has been carried out. Most of the government initiated infrastructure projects are delayed and get finished years after their scheduled completion. This review revealed that the most frequent groups used for categorization which are: contractor, owner, consultant, material, equipment, external, labour, design project. Delay issue is an ongoing issue faced by construction industries for decades. However, the delays issue can be minimized via proper management, interpersonal, technical and technology in conduct construction project.

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