

REVIEW SENSITIVITY ANALYSIS OF PROJECT SCHEDULING USING FUZZY SET THEORY

Batan Sharma¹, Dr. Mukesh Pandey²

¹PG scholar's, Civil Engineering Department, ITM University, Gwalior

²HOD, Civil Engineering Department, ITM University, Gwalior

ABSTRACT: - This paper represents the practical applications of fuzzy set theory in the predicting delay in construction industry. The construction industry is one of the most important aspects of a civil engineering structure. The fuzzy set theory is an important part of construction industry. The fuzzy sets are the sets which are introduced by Lotfi a Zadeh and Dieter Khana in 1965. There are many construction problems in a construction industry which effects on the construction in different wages, like delay in construction, construction cost, material used on side etc. due to these problems, we caused delay in construction. there are many methods which estimation the delay duration of activity in a construction industry. The fuzzy set theory is one of them. This method helps us to minimize the product of sum of the membership association for a certain frequency of occurrence and corresponding frequency of occurrence. The CPM (critical path method) and PERT (Program Evaluation and Review Technique) are used in the activity delay. Fuzzy logic provides a simple way to solves a definite conclusion based upon vague, missing input information. The fuzzy logic is a form of value is deal with the reasoning i.e., approximate rather than fixed.

Keywords: - CPM, PERT, Fuzzy logic, Delay, Construction problem.

1. INTRODUCTION

The fuzzy set theory plays an important part in the construction industry, it has been studying over the last 50 years. The fuzzy logic set theory is introduced by the zadeh in his paper on Fuzzy set. the fuzzy logic set theory is now applied to problems in construction engineering, business, medical, related health sciences, and the natural sciences etc. In an effort to gain a better understanding of the use of fuzzy logic set theory in construction industry management research and to provide a use for future research, a literature review of fuzzy set theory

in construction industry management has been conducted. In 1956, the critical path method (CPM) was implemented on a computer to schedule construction project. In 1957, a technique implements called the program evaluation review technique (PERT) has developed to integrate the coordinate contractor working on a single project. Recently a method called graphical evaluation and review techniques (GERT) was developed. It is the simplest method to say the dovetailed in the construction industry. It is useful when performance of all the operations is not necessary for the completion of projects.

All the methods used in the fuzzy set theory has been totally divided into different two groups deterministic and probabilistic. When the information is used for a particular method and which is known during the analysis is called as deterministic, the critical path method and bar chart is define as the deterministic. In the probabilistic method every parameter is generally expressing in terms of mean, coefficient of variation, standard deviation etc. program evaluation and review technique, and graphical evaluation and review technique can be classified as a probabilistic method.

However different probabilistic method is used with various degrees of complexity in construction engineering. Now day parameter is expressed in mathematical term, because classical probability theory fails to inaccurate the information. So these linguistic variables can be used in a mathematical form by fuzzy sets and system theory. The all problem related to weather and labor delay can be solved in paper using these concepts of fuzzy sets theory.

2. LITERATURE REVIEW

The various literatures are studied to get an overview of the factors responsible for a construction delay in the construction industry and we studied the various uses of the fuzzy logic set theory in

various fields. This paper helps me to understand the fuzzy logic set theory.

Pandey M.K, Dandotiya A, Trivedi M.K, Bhadoriya S.S, Ramasesh G.R.

“Delay Computation Using Fuzzy Logic Approach” the author uses the fuzzy logic set theory, which helps the author to find out the total delay duration on the construction site. Initially the research is based on the real project executed in Gwalior (mp), and find the delay duration due to shortage of materials and lack of operators. After that the author applies the fuzzy set theory on project with linguistic and membership values. The writer gets the nearly same value in his research.

Bilal M. Ayyab and Achintya Halder

“The project scheduling using fuzzy set concepts” this paper analyzed the project scheduling method using fuzzy set which helps us to find out the delay duration in any completed project. In this paper the author uses the linguistic function along with membership function to find out the delay duration in any project. One of the important uses of this technique is that it can be easily implemented in existing computer programs for project scheduling.

Shruti Singh, dr. M.K trivedi

“APPLICATION OF FUZZY LOGIC IN DELAY ANALYSIS IN CONSTRUCTION” this paper represents the application of fuzzy logic in analysis of delays in construction industry using fuzzy toolbox of MATLAB program software. The author takes the different factor of delay labor related, project related, consultant related, contractor related, external factor, owner related, material related, environment related, design related, equipment related etc. a case study and an interview was done by the author in housing project in Gwalior, to determine causes of delay with a help of questionnaire survey. The value of factor ranging from 1 to 100 as a probability of schedule delay (01 for very low and 100 for very high).

M.H Sebt , H. Rajaei ,M.M P akseresht

“A FUZZY MODELING APPROACH TO WEATHER DELAY ANALYSIS IN CONSTRUCTION PROJECT” the author uses the same process which is used by the Bilal M. Ayyab and Achintya Halder in his research paper but after that the author

compares the different weather with the different activities. The time impact analysis for different delay analysis can be used.

Adriana V. Ordonez Oliveros and Aminah Robinson Fayek

“Fuzzy logic approach for Activity Delay Analysis and Schedule updating” the research aims to make a fuzzy logic model for modifying activity durations and the model integrates daily site reporting of activity progress and delays with a schedule updating and forecasting system for construction project monitoring and control.

3. CONCLUSION

The critical review undertaken in this paper covers total effect of delay, and seen the different method of finding out the delay duration in different wages. The other authors used the different methods like RII, AHP etc, but in this paper we used the fuzzy logic set theory for determine the delay duration.

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