

A Study on Existing Contract Systems and Evaluating Probabilistic Cost Determination in Nabard Road Using Simulation Techniques in Ramanathapuram District

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ABSTRACT: The general requirement in day to day construction management is availability of a reliable schedule. Many models have been tested from time to time. Many among them have been found reliable. In this study yet another model which is based on Monte Carlo principles is put to test theoretically. A case study of a project which is in process is chosen. The project had a well laid out schedule already. In middle of the project the completed portion of project is studied and the same is compared with interpreted schedule for same based on Monte Carlo Simulation method. This comparison will suggest how reliable the schedule is. The main objective of this study is to develop a tool so that any change necessary in the schedule can be identified and brought up before it is too late in the project.

I. INTRODUCTION

Projects in the construction industry are inherently subject to more risk and uncertainty than those in most other industries. For example, the required duration for completion of an activity will normally depend on the availability of resources (labour and equipment), on weather conditions and on the availability of materials. Quite often, construction projects fail to achieve their time, quality, and budget goals. The purpose of risk analysis and management is to help managers to avoid or minimise the economic impact of these failures. Change in project cost or cost growth occurs from many factors.

II. OBJECTIVES AND SCOPE

To know better risk awareness for the project and determine deviation due to some unpredictable changes at present so to avoid the risk by taking precautions in future projects.

Helps project managers to know about risk included in project. Detail study on contract system could be achieved

Probabilistic cost of particular construction work would help in future project risk and to overcome.

III. SIMULATION WORKFLOW

Using simulation for construction scheduling requires several pre-processing steps. During Pre-processing, information available about the construction project needs to be analyzed and prepared. The result of the pre-processing steps is used as input data for the simulation and is stored in a simulation database. The simulation database is the central access point for all simulation components during the entire workflow. After pre-processing, the construction simulation can be performed using any suitable simulation software. The simulation results are also stored in the database to allow systematic evaluation.

During evaluation, the input data and assumptions have to be checked for accuracy and the results have to be

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compared with the objectives of project planning. Although the result of each simulation run is technologically feasible, it might be contradictory to certain project objectives, such as cost or allowed execution time.

To generate different alternatives or change assumptions, the pre-processing must be performed again based on the results of the previous simulation. The generation of efficient solutions is usually an iterative process

IV. RISK MANAGEMENT

Project Risk Management (Prm) Process

Project risk analysis is an essential part of Project Risk Management (PRM) process. They have defined PRM as "a process that accompanies the project from its definition through its planning, execution and control phase up to its completion and closure. The Project Management Institute (PMI) (PMBOK, 2004) presented six phases of PRM process: risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning and risk monitoring and control. It suggested PRM process should consisted of two main phases :(1) risk analysis which includes the identification, prioritization estimation and evaluation of risk, and (2) risk management which includes planning appropriate responses, monitoring and managing those responses. Although there is a general agreement about what should be included in the PRM process with some differences in the level of details, however, the very common phases of PRM process are: risk identification, qualitative risk analysis, quantitative risk analysis, risk response/mitigation, and risk monitoring and control. explored different elements of PRM process such as risk identification, qualitative/ quantitative risk analysis, risk mitigation, and risk monitoring and control.

V. MONTE CARLO SIMULATION

STEPS OF SIMULATION

- Establishing probability distribution for important input variables.
- Build a cumulative probability distribution for each variable.
- Establishing an interval of random numbers for each variable.
- Generating random numbers.
- Simulating a series of trial.

Step 1: Collection and study of literature

The first step in the work will be doing a literary study regarding Monte Carlo Simulation and its application in infrastructure field. From those experiences from various people who worked on the same topic we will take out the various things done and I will plan the work procedure accordingly.

Step 2: Learning the Simulation Method

From text books and previous woks we will learn the procedure to do simulation in MS excel software in detail.

Step 3: Preparing Check list for data collection:

Based on the scope of our work and data required for my thesis I will prepare a check list and will determine what approaches to use to examine in depth and which instruments and data gathering approaches to use. Tools to collect data can include documentation review, observation, and even the collection of physical artefacts.

Step 4: Data Collection

In a systematic way I will collect the data in the formats that I finalize. Renegotiation of arrangements with the objects of the study or addition of questions to interviews may be necessary as the study progresses. Case study research is flexible, but when changes are made, they are documented systematically.

Step 5: Evaluate and analyze the data

Specific techniques include placing information into arrays, creating matrices of categories, creating flow charts or other displays, and tabulating frequency of events. I will use the quantitative data that has been collected to corroborate and support the qualitative data which is most useful for understanding the rationale or theory underlying relationships.

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Step 6: Conclusions and Interpretations

Based on the data analyzed I will come to know about the present application and method in which simulation technique is used and I will suggest valid points or ways which will improve the application this technique along with proper justification

VI. CASE STUDY

- Name Of District : RAMANATHAPURAM
- Name Of Block : R.S. Mangalam
- Name Of Panchayat : Sethidal
- Name Of Work : Improvements the road from sengudi vandai muthupatinam (via) ettiyathidal road
- Name of Scheme : NABARD xx 2015-2016
- Total length of the road : 4625m
- Type of surface of road : BT
- Existing condition of road : BT damaged.
- Number of slab culvert 1.50m span : 10

VII. DATA PROCESSING

Grouping of data

- Calculation have been made at each interval of 100m with all description of work for first 1km.
 - Picking the old metal surface back hoe machine have been used and for the first 1km length it was operated for about 10 and half an hour.
 - Amount for 1 hour = rs 850
 - Total amount paid = rs 8925.
 - above work backhoe machinery have been used for 14 hours and paid rs 11900.
 - Compacting roller used about an hour and paid 3000.
- Labours worked in watering paid with 2750

VIII. INTERPRETATION AND CONCLUSION

- The average of cost actually taken for completion is significantly different from the stimulated value. This implies that the simulated time must be kept as a benchmark and remaining part of the construction process must be modified accordingly.
- Whenever there is a delay experienced in any project the above method of Monte Carlo Simulation can be adopted and the variations with planned time can be found and rescheduled according to that
- This method of simulating the cycle will help in finding out the reasons for delays and knowing about the delays which can be controlled and uncontrolled and helps in taking further decisions.

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