ANALYSIS OF PROJECT CRASHING IN CONSTRUCTION

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Abstract - *To solving the delay problems and to solve the short meet deadlines project crashing is the best method. So were take the crashing method to solve the delay problems using MS Project. The paper shows the factors affect the crashing of project to minimize the delay and to faster project execution in the construction industry were consider by creating the questionnaires. There were selecting the seven important elements which mainly affect the crashing of the project. These elements are helpful to crashing the project by increasing the resources of the project. The main purpose of the questionnaire survey to find the crashing factors and exactly what are the problems are arises in the construction and how to overcome that problems by using crashing method. The result were calculated and factors were rated based on their likelihood of factors affecting the crashing. For finding the ratings Relative Important Index method were used. According to the findings of this study top five factors are considered which are affecting the crashing of the projects those are: Skilled labors and Money (Rank 1), Equipment's (Rank 2), Time management (Rank 3), Recourse allocation (Rank 4), Safety measures (Rank5).*

*Key Words***: Time, Cost, Scheduling, Crashing**

1. INTRODUCTION

India is the one of the fastest developing country. For developing any county economy is very important. Indian construction sector gives the big support to developing the country growth. But now a day's construction industry facing lot of problems due to that problems delay occurs in the construction projects.

To solve the short meet deadlines project crashing is the best method to solve these problems [1]. The successful project includes the systematic planning and application of planning is very important. Project management is very important for completion of the project. Project management includes the application of knowledge, tools and techniques [3]. Now a day's project management facing lot of problems such as quality, environment, technical problems, safety management, time management and overcast problem etc [6]. In every project management project manager plays the important role to complete the project. He is only responsible for the all activates. In project management the team or group of people have the common goals to complete the work [4].

1.1 About MSP Software

Microsoft Project is the one of the best software in the world developed by Microsoft. It is very helpful in every construction to project manager [7]. It helps the project manager to developing the plans, scheduling the project, allocation of the resources, tracking the progress, cost analysis etc. It also helps to project manager to rescheduling the activity and it having the own calendar which defines days and shift of resources available. In this software it is easy to assign the activities, resources, time and cost. Budget monitoring is one of the major factor in every construction projects in this case it is very easy to maintain the cost and monitoring the budget. MS Project builds the critical chain and timeline for critical activities

1.2 Objective of the Study

The main aim of this study is to identify the crashing factors to solve the delay problems in construction. For this purpose, the following objectives are set.

1) To plan and schedule the project using MS Project software.
2) To identify the factors affecting the crashing of project through questionnaire survey.
3) To analyses the crashing factors.
4) To estimate the project crashing by taking a case study.

2. METHODOLOGY

2.1 General

To achieve the desired result well defines methodology becomes very important. The fallowing methodology is used in this project.

1) Collection of the data from project area.

2) Adding the project activities.

3) Applying the duration for each activity.

4) Resource allocation.

5) Project tracking.

6) Applying the crashing to overcome delay.

3. DATA COLLECTION AND ANALYSIS

3.1 Data Collection

A different 114 response were collected from various engineers, contractors etc. And Relative Important Index used for the ranking the factors.

3.2 Analysis

Crashing factor analysis will be based on:

- Relative Important Index

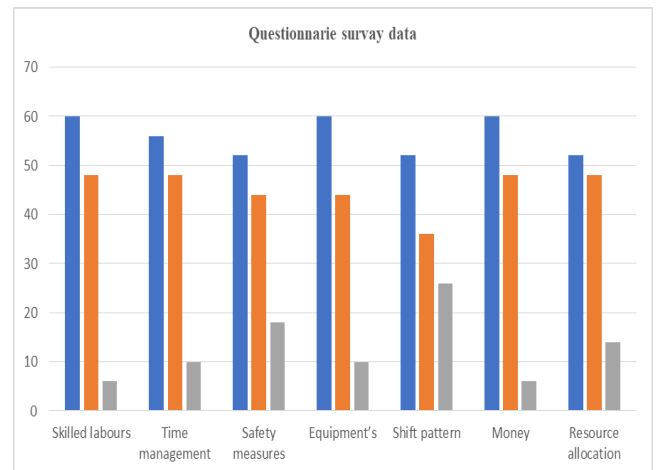**Relative Important Index = $3n_3 + 2n_2 + 1n_1$ / A * N**

Where,

A = Highest value (i.e. 3 in this case)

N = Total number of response

Table -1: Data collected through questionnaire survey

Types of factor	Very high	High	Low
Skilled labors	60	48	6
Time management	56	48	10
Safety measures	52	44	18
Equipment's	60	44	10
Shift pattern	52	36	26
Money	60	48	6
Resource allocation	52	48	14

Chart -1: Questionnaire survey data Graph

Types of factors	Total	Total No (N)	A*N	RII	Rank
Skilled labors	282	114	342	0.8245	1
Time management	276	114	342	0.8070	3
Safety measures	262	114	342	0.7660	5
Equipment's	278	114	342	0.8128	2
Shift pattern	254	114	342	0.7426	6
Money	282	114	342	0.8245	1
Resource allocation	266	114	342	0.777	4

Fig -1: Ranking of crashing factors

3.3 Case Study

Up gradation of primary health center in Belagavi district in Karnataka. The basic objective of PHC to provide healthcare facilities. Total site area is 1316.70 sq. m. and total built up area is 537 sq. m. The main purpose of this PHC is to provide the medical facility to the poor people.

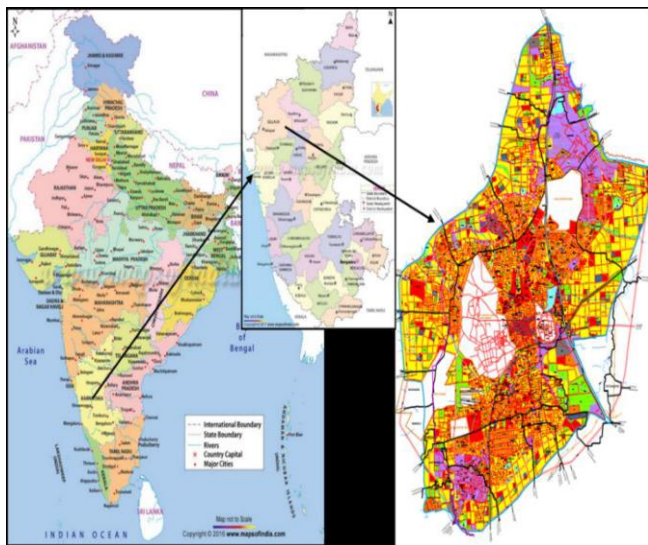| Project Name | : | Up gradation of primary health center |
Location	:	Belagavi
Project area	:	537 sq. m.
Cost of project	:	Rs 2, 20, 00,000
Starting date	:	15-11-2019
End date	:	16-07-2020

Fig -2: Location of PHC Belagavi

3.4 Work Stages

For the better execution of project work is divided in two stages, which are as bellows [7]:

1) Project scheduling without any effect of delay.

2) Project scheduling considering the effect of pandemic Covid-19.
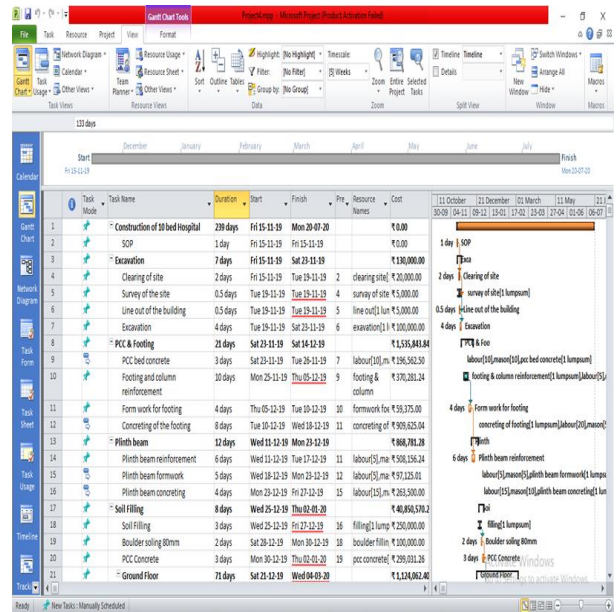
1) Project scheduling without any effect of delay

Fig -3: Project scheduling without any effect of delay

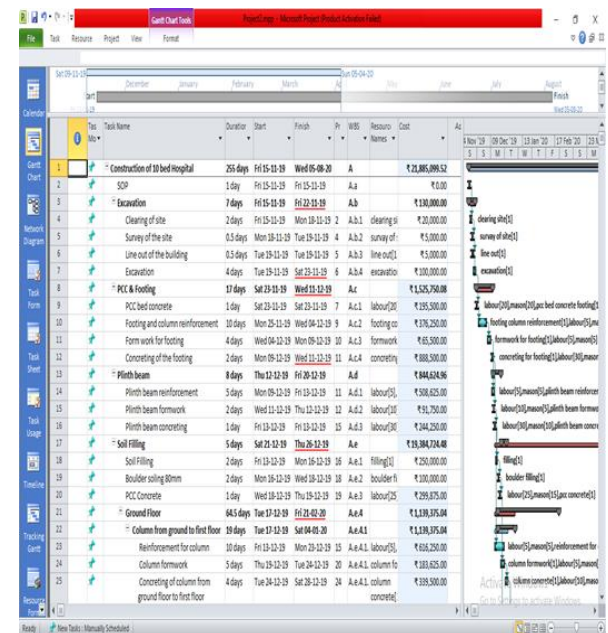**2) Project scheduling considering the effect of pandemic Covid-19.**

Fig -4: Project scheduling considering the effect of pandemic Covid-19.

4. CONCLUSIONS

1) Proper management, interpersonal management, technical management, and the use of technology in building projects may all help to reduce delays.

2) Through a literature and questionnaire survey of the respondents, this study identified factors responsible for crashing the project.

3) By using Relative Important Index crashing factors were ranked as: Skilled labor and Money (Rank 1), Equipment's (Rank 2), Time management (Rank 3), Resource allocation (Rank 4), Safety measures (Rank 5), Shift pattern (Rank 6).

4) Using the MS project software concludes that proper planning, tracking and scheduling is more efficient than the traditional paper works.

5) We were scheduling for the project without any delay and start the project as per scheduling, but due to the Covid-19 there was lockdown because of that construction work was stopped and delay occurred. To overcome this crashing method is adopted using MS project software.

6) As a result 53 days delay recovered in only 15 days by using project crashing method and 1 % cost of overall estimation was increased.

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