OPTIMIZATION OF PLANNING, SCHEDULING,
AND CONTROL OF HIGH RISE
CONSTRUCTION PROJECTS

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ABSTRACT

Nowadays in the construction industry is delaying due to inappropriate planning and scheduling with the help of P6 software it can achieve the appropriate planning and scheduling still many construction companies are following the traditional way of planning but few companies are using P6 software. In olden days planning takes more time and with the help of P6 software, time is minimized during the planning stage. This study deals with the optimization of planning and scheduling method can be explained and how much time can be saved. The main objective of the research is to detect the scheduling technique followed by the organization, to develop the critical path method and to investigate the errors in planning and scheduling.

KEY WORDS: Planning, Scheduling, P6 software, Optimization, Critical path method.


1. INTRODUCTION

In construction industries, all construction projects are time bound and directed achieve the project objectives with respect to time and quality. Project management is the procedure of collection of data, recording the data and reporting the data allowing to the performance of the project. Planning and scheduling aim at the suitable execution of work according to project plan schedule and can apply remedial measures in the event of any several deviations occur. Monitoring the progress of the project with respect to the time, Performance, scheduling and resources throughout the actual implementation of the project and can identify the delay area which requires timely proceedings to be taken. The task of finishing off a construction site
within an estimated time is the most crucial task among the project managers. Unavoidable delays and cost in projects may happen due to improper coordination and communication between the line managers. These constrain make project management makes a difficult task. (Unmesh 2015) said that in his project by using P6 software and accomplished by data collection of three main aspects such as by taking a day to day reports, labor-Work output, activities are running agreeing to their planned duration. (EsakkiThanga 2016) explains that p6 software that develops the quality and the construction management with effective cost and time within the sequences and minimum resources. (Subramanian 2015) says that IBS (Industrial building system) is best time-saving technique and this method does not have enough popular and compares with the conventional method. And with the help of Primavera software many industries got helpful for their planning and scheduling. (Siva Nagaraju 2016) said that performance of Primavera software for metro rail projects to reduce the delays in the project. In past days it required more paper work at the planning stage itself. So, at the present globalization scenario by using P6 software delays can be minimizing by planning and scheduling stage. (Satish Chandra 2017) said that M.S.P software will consider every aspect of planning stage itself and scheduling and take accountability for every activity which can be easily analyzed. (Vijay 2016) states that project delays may occur due to the inadequate and timely supply of resources this can be overcome by proper planning and scheduling techniques by using the P6 software. (Rajendra 2016) said that with the help of P6 software multiple projects can be managed easily and resource optimization can be done for each project and can be compared so that the postponements can be recognized. (Hammed Ziaiadoostan 2013) said that based on personal or political factors strategic management is not implemented resources are assigned to some of the organizations. So by using resource distribution primavera software can be done, resources can be allocated in an effective manner. (Patil 2013) said that to achieve the profit with in limited time and funds some construction activities can be managed. In 1970’s some of the management methods, for instance, PERT, CPM has implemented in various projects. (Uma 2016) said that planning and scheduling plays an important role in various projects due to increasing in complexities in the construction field for scheduling and planning the huge amount of paperwork will take, to reduce these problems primavera software can be used.

2. NEED FOR STUDY
Using P6 software scheduling is done, delays can be identified and optimization is done for each activity. Corrective events have been suggested.

3. OBJECTIVES
   1. To identify scheduling method used by the organization in developing plan and schedule.
   2. To develop a schedule and determine the CPM using Primavera software.
   3. To investigate faults in the planning and scheduling procedure.
   4. To follow and optimize the project and estimation is done.

4. RESEARCH METHODOLOGY
This research methodology gives a guide to achieve the objectives of the study and discuss the detail procedure. The research methodology helps to understand the problems that are a time constraint, objectives of the study. A literature analysis is collected from several journals, articles, books. A G+6 building is selected as a study area and detail schedules are collected from the site and with the help of P6 software analysis is done. With the aid of critical path method scheduling is prepared. Finally, optimization is done and budget is prepared.

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4.1. Steps involved in the Primavera software

1) Creating the schedule
To form a schedule for a project first, we have to gather the data for the project. The next steps to follow in P6 software.

2) Enterprise Structure (EPS)
Create a complete arrangement of a company with its subdivisions, which is executed in Primavera software. This is known enterprise structure.

3) Organization Breakdown Structure (OBS)
In this structure, it represents the entire management responsibilities of the project.
4) Creating calendar
In this step, we have to create our own calendar in these working hours to be given.

5) Creating a new project
In this step, we have to form a new project. In this, we will give the project details and we will give the relation between the EPS and OBS.

6) Work break down structure (WBS)
In this step the works of the project to break down into a stepwise step structure in detail of the project.

7) Define activities
In this step activities are the fundamental key work of the project. Project activity contains some characteristics like activity calendar, activity name, activity type, activity code, activity ID etc.

8) Define the relationship between the activities
There are four relations. They are
- Finish-start relationship (FS)
- Start-start relationship (SS)
- Finish-finish relationship (FS)
- Start-finish relationship (SF)

9) Activity duration
In this step time of each activity is calculated in the project.

10) Activity cost
The total expenditure of each activity is calculated and given in the project.

5. RESULTS AND DISCUSSION
At present scenario of all construction companies main aim is to achieve the project within the stipulated time and with the available resources helps financial and accomplish the project with profitably. To come across the schedule quality of the project is done by using various techniques established in the recent developments in the construction field. Improvising the project with critical path method using the Primavera software. Reducing the wastage of resources and budget. Fig. 2 explains the overall structure of the project detailly. Fig. 3 to Fig.5 gives the details of each activity with there duration and estimation is done in this duration is not optimized.Fig. 6 to Fig. 8 gives the details of each activity with there duration and estimation is done optimization technique is done and finally, the duration is decreased.
Figure 2 Work break down the structure

Figure 3 Scheduling without optimization
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Figure 4 scheduling without optimization

Figure 5 scheduling without optimization
**Figure 6** Scheduling with optimization

**Figure 7** Scheduling with optimization
6. CONCLUSION

Based on the study approved the best features of Primavera software in schedule controller techniques, it is concluded that Primavera software can be used to schedule the project and reduce project duration in the construction project.

- This research helps to identify the defects in planning, scheduling process of the organization.
- A perfectly planned project helps in reducing the loss of cost and time.
- Primavera software is a user-friendly which provides user to perform any type of task, the cost of any individual work break down a structure can be known along with duration.
- With help of Primavera software, 6% of the schedule has been optimized compared to the originally planned schedule.
- After optimization of cost, there is a variance of 2.9% in the cost compared to the originally planned budget.

REFERENCES


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