

PROJECT PLANNING AND MANAGEMENT OF STRUCTURE USING PRIMAVERA P6 SOFTWARE

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ABSTRACT

The Construction industry is an important and developing part of the nation's infrastructure & industrial growth. In the construction industry construction managers has to deal with lots of problems for many years which is new for these industries. Some problems are time management and its limitation, safety issues, changes in nature of work, budget constraints, etc. According to previous observation and experience, proper skillful management is very essential to resolve and reduces these issues effectively. Primavera software can overcome these issues adequately. While planning a project effective management of cost and time is very important. This project is mainly focused on project management and scheduling by using Oracle's Primavera P6 software. A comparison between actual and planned work is performed under this software. Effective planning results in improved performance in costing, scheduling and operation analysis, and balancing the needs of the project. Traditional methods of management can't fulfill the needs of today's construction industry as large no of data and information are changing constantly. Hence, there is a need for primavera software p6.

Keywords: Project Management , Planning , Scheduling , Controlling.

I. INTRODUCTION

Project management devotes a very important contribution to the construction industry. Project management can be quoted as " Prevention is better than cure ". The main objective of this project management is to execute our goals according to planned resources that meet the project's time, quality, quantity, and safety requirements. In India, most of the companies follow the method of CPM, pert, gannt chart, etc. This project enlightens the use of oracle's primavera p6 software in project management over traditional methods of management. According to the requirement of project small, medium, or large size primavera management projects can be performed throughout the world. that's why it is mainly used in large businesses like construction. Project monitoring and control includes the process of collecting, recording, and reporting information about project daily performance. Monitoring the daily update of the project concerning the time, its performance, scheduling, and resources with the actual execution of the project on the field and can identify the delay area. Construction activities are not restricted only to on field activities but also involve effective management of manpower, materials as well as machinery. Primavera p6 minimize the wastage of extra efforts and also helps to maintain the precision and quality of the project.

II. PROBLEM STATEMENT

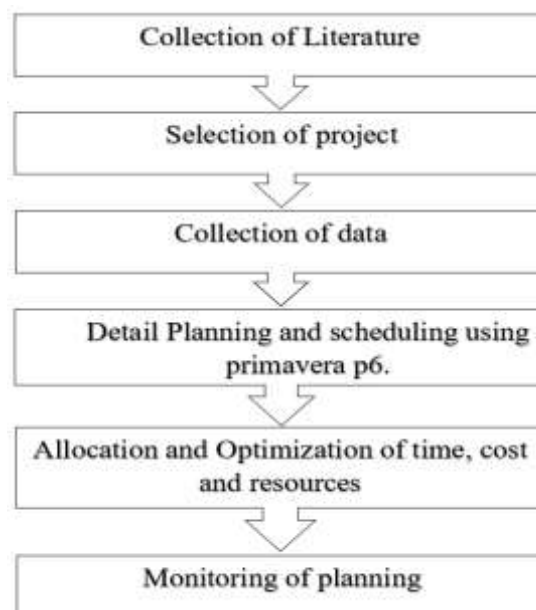
With the complexity of construction projects increasing day-by-day a whole new level of pressure is been added on the construction management teams to execute satisfactorily with minimum loss and maximum gain. Construction businesses are struggling to cope up with the continuously fluctuating markets and drastically changing demands and requirements of the clients. To counter this, the entire project is divided into separate departments. All the departments require around-the-clock coordination among each other for the proper execution of work. The Manager is the one who holds all the management departments. He requires a tool to efficiently deliver the project within the given time and under the approved budget as promised. To accomplish this task, the Manager needs the ability to successfully combine the project and program resources from the various departments and other locations to ensure satisfactory project success.

III. OBJECTIVES

- For Accomplishment of Project In Fixed Duration with Estimated Budget For Long Distance Monitoring.
- To make Management of Labor And Material in Pre-Planned Scheduled structure of Projects.
- To Organizing work in the appropriate order and their coordination during execution.
- To Assign Resources and Activities Accurately To Execute the Project Without Disturbance
- To warn about upcoming crises or issues quickly

IV. METHODOLOGY

1. Collection of literature : - Collection of literature is very important to provide foundation of knowledge on topic. Literature review is done from various sources which include scholarly journal articles, books, government reports, Web sites, etc. and points relevant to our research are sorted and are added in our project study.
2. Selection of Project : - Project is selected which has good futuristic scope and will also help us to get good command on software and learn a lot more things about project management. Such a project is selected that is completed within our research time so as to analyse it completely and provide any recommendations if needed.
3. Collection of data : - Data collection is very important and tough part because they have to links up with project staff to collect related data. Data is collected through various resources like site survey , previous technical reports. The collected data included information about the project which was helpful in scheduling and costing.
4. Detailed Planning and scheduling using primavera p6 : - This software enables functions like planning, scheduling, budget and resource management software that help organizations to make informed decisions and improve their ability to deliver projects on time and under approved budget.
5. Use of Primavera P6 for scheduling and planning in detail:- This step includes identifying all the various activities and assigning relationships with each other keeping in mind all the aspects like period, cost, and capacity or efficiency of the resources and the project.
6. Allocation and Optimization of time, cost and resources :- In this step the present market cost of resources are entered into a resource section , after entering cost, the resources are assigned to specific activities and actual cost of these specific activity are calculated. From the actual cost of all the activities a budgeted cost is calculated and in this case by finding the shortest path the cost of project is optimize.
7. Monitoring of planning :- Monitoring of planning involves tracking the progress of the project with respect to time and resources while execution of the project. It also identify lagging areas in regards to time . It reduces the human resource of monitoring and controlling of project and also reduce wedges of human resource which leads to reduction in project cost.



V. STEPS INVOLVED IN MONITORING AND CONTROL OF PROJECT

01) Data collection:-

To make the schedule of the project we have to collect all required data to execute the project. After collecting data there is a need of segregating data properly and save it as in the hierarchical structure of work. Collected for this project include computer-aided drawings (CAD), the number of materials, resources required such as pieces of machinery labors and material. All the data for the execution of the project need to be accurate and perfect The work of the school construction project is divided as per the following steps.

02)Enterprise structure for a school project:-

Creating the complete structure of the company with its branches, which is executing the project using primavera P6. This is known as Enterprise project structure (EPS). In the project, we have created an enterprise with the name YCCE in that we have created the project as name school construction. EPS represents the network structure of all projects in the database. It can be subdivided into many levels.

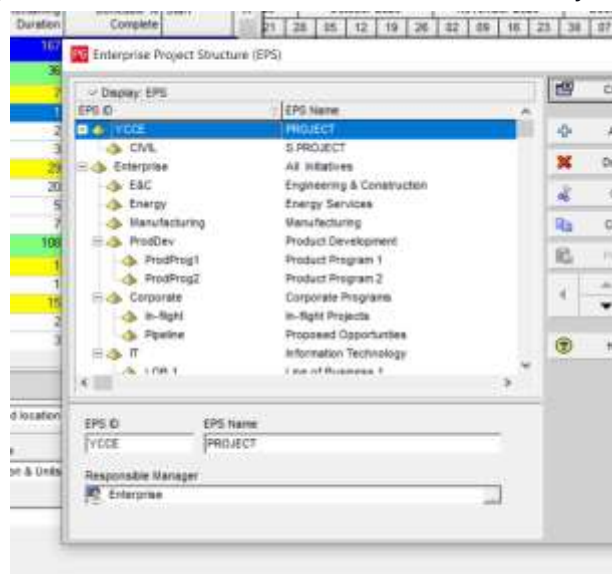


Fig. 1 Enterprise project structure

03) Organizational breakdown structure (OBS) :-

In OBS of school construction building structure is breakdown in various sub structure. OBS is made in a hierarchical shape structure, that shows the persons responsible for the projects in the enterprise. OBS is created which is globalized network that represent the manager responsible for the project in your enterprise.

04) New project creation under EPS :-

A project is a collection of activities and associated information that constitutes a plan for creating a product or service. In primavera P6 we have created new project with name SCHOOL CONSTRUCTION under the EPS YCCE. The project is made under the respective divisions in Enterprise Project Structure. And allocate the person in charge from Organization Breakdown Structure to it. Planned start and must finish dates can be given to project. The project is allocate a calendar which can be global, resource or project calendar.

05) Work breakdown structure (WBS) :-

Work breakdown structure of school construction project is divided on the basis of different buildings such as Academic building, Administration building, Canteen building, Auditorium, swimming pool, Football, tennis court, roads, garden, and other different structures. The divided work is again divided in to different sub-work and segregate the work in proper and suitable structure such as in academic building sub work is sub-structure, super-structure and in that subwork there are subsubwork such as ground floor, first floor, third floor, fourth floor as in superstructure. Work breakdown structure clearly identify the project work and data at different levels to ease the execution of construction. WBS is a structure of any project work that must be followed to complete a school construction project.

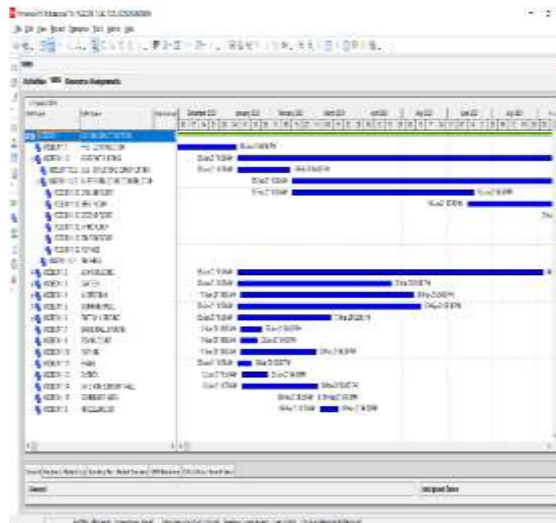


Figure 2: Work breakdown structure

06) Activities for different buildings:-

Preconstruction:- The process of pre-construction has a total of 5 activities that take 78 days for completion starting from 5 Oct 2020 and lasting till 8 Jan 2021.

Academic building:- The distribution of activities of the academic building is divided into 3 Sub-WBS i.e. 1) Sub Structure construction which has 10 activities that take 29 days for completion, starts on 8 Jan 2021 till 13 Feb 2021. 2) Super Structure construction which has 78 activities that take 362 days for completion, starts on 13 Feb 2021 till 22 April 2022. 3) Finishing that has 8 activities which take 195 days for completion, starts on 28 April 2022 till 12 Dec 2022. So the Academic building has a total of 96 activities that take 586 days for completion starting from 8 Jan 2021 till 12 Dec 2022

Administration Building:- The distribution of activities of the Administration building is divided into 3 Sub-WBS i.e. 1) Sub Structure construction which has 10 activities that take 19 days for completion, starts on 8 Jan 2021 till 2 Feb 2021. 2) Super Structure construction which has 32 activities that take 115 days for completion, starts on 3 Feb 2021 till 26 June 2021. 3) Finishing that has 7 activities which take 31 days for completion, starts on 26 June 2021 till 3 Aug 2021. So the Administration building has a total of 49 activities that take 166 days for completion starting from 8 Jan 2021 till 3 Aug 2021.

Canteen:- The distribution of activities of the Canteen is divided into 3 Sub-WBS i.e. 1) Sub Structure construction which has 10 activities that take 16 days for completion, starts on 8 Jan 2021 till 29 Jan 2021. 2) Super Structure construction which has 17 activities that take 50 days for completion, starts on 30 Jan 2021 till 1 April 2021. 3) Finishing that has 7 activities which take 29 days for completion, starts on 13 March 2021 till 20 April 2021. So the Canteen has a total of 40 activities that take 80 days for completion starting from 8 Jan 2021 till 20 April 2022.

Auditorium:- The distribution of activities of Auditorium is divided into 3 Sub-WBS i.e. 1) Sub Structure construction which has 10 activities which take 20 days for completion, starts on 9 Jan 2021 till 4 Feb 2021. 2) Super Structure construction which has 11 activities which take 47 days for completion, starts on 4 Feb 2021 till 3 April 2021. 3) Finishing that has 6 activities which take 25 days for completion, starts on 3 April 2021 till 7 May 2021. So the Auditorium has a total of 27 activities that take 92 days for completion starting from 9 Jan 2021 till 7 May 2021.

Swimming pool:- The distribution of activities of Auditorium is divided into 4 Sub-WBS i.e. 1) Sub Structure construction which has 10 activities which take 17 days for completion, starts on 8 Jan 2021 till 30 Jan 2021 2) Super Structure construction which has 14 activities which take 45 days for completion, starts on 30 Jan 2021 till 25 March 2021. 3) Swimming pool construction that has 4 activities which take 10 days for completion, starts on 25 March 2021 till 7 April 2021. 4) Finishing that has 6 activities which take 26 days for completion, starts on 7 April 2021 till 11 May 2021. So the Swimming pool has a total of 34 activities that take 96 days for completion starting from 8 Jan 2021 till 11 May 2021.

Football ground:- The distribution of activities of Auditorium is divided into 2 Sub-WBS i.e. 1) Sub Structure construction which has 6 activities that take 9 days for completion, starts on 8 Jan 2021 till 20 Jan 2021. 2) Super Structure construction which has 4 activities that take 42 days for completion, starts on 20 Jan 2021 till 13 March 2021. So the Football ground has a total of 10 activities that take 51 days for completion starting from 8 Jan 2021 till 13 March 2021.

Basketball court:- The construction of the basketball court has 7 activities which take 13 days for completion, starting from 9 Jan 2021 till 23 Jan 2021.

Tennis court:- The construction of the Tennis court has 8 activities which take 10 days for completion, starting from 9 Jan 2021 till 22 Jan 2021.

Parking:- The construction of the Parking area has 8 activities that take 42 days for completion, starting from 9 Jan 2021 till 3 March 2021.

Roads:- The construction of Roads has 11 activities which take 7 days for completion, starting from 8 Jan 2021 till 18 Jan 2021.

Garden:- The construction of the Garden area has 4 activities that take 14 days for completion, starting from 11 Jan 2021 till 29 Jan 2021.

Gate and boundary wall:- The construction of area has 7 activities that take 42 days to complete, starting from 11 Jan 2021 till 4 March 2021.

Total School project:- The construction of the school project has a total of 297 activities which take 663 days for completion starting from 5 Oct 2020 to 12 Dec 2022.

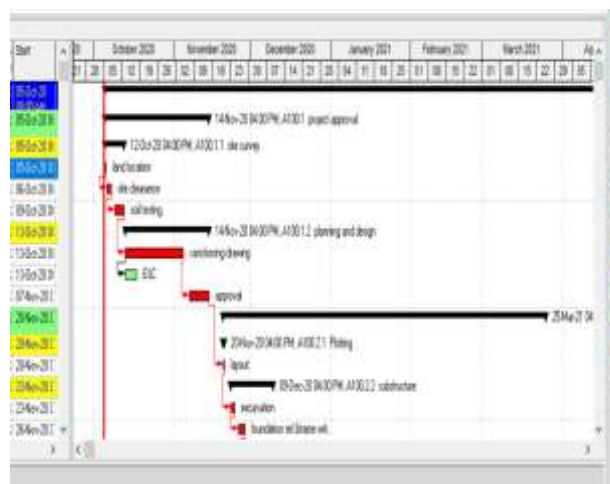


Fig. 3 Relationship between activities

07) Calendar and schedule:-

In the school construction project we have inserted various holidays and half days and also mention daily working days. The calendar can create and assign to each activity. These calendars define the available work hours on each calendar day. Also specify national holidays, organizations, and projects.

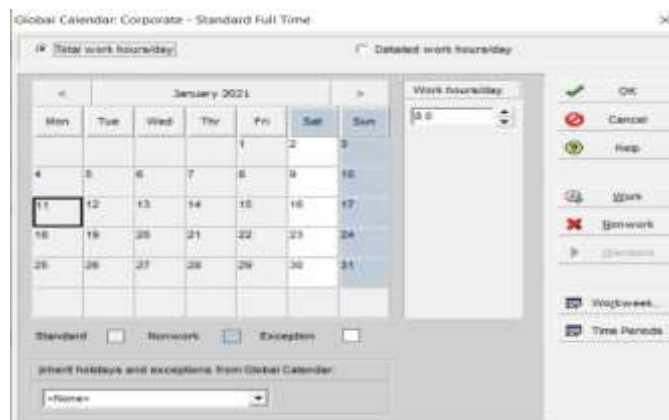


Fig. 4 Calendar



Fig. 5 Activity duration and date

08) Activity cost or budgeted cost:- The project cost is differed and minimized as manually the estimated cost of the project. In Primavera P6 after allocation of resources to respective activities and their cost, the actual cost of an activity is calculated which includes the actual cost of execution of the specific activity. After this, the budgeted cost of the project is calculated which includes the cost of all activities.

09) Tracking Progress of project :- The tracking window is used for monitoring the execution of project activities' progress by using different categories of layouts. A Gantt chart is provided on the right side of the window and shows the progress of work using bars also show the lags and total duration required to complete the project. The tracking chart also shows the relationship of activities with each other. It shows in a diagrammatic form which helps to understand the progress of the project easily.

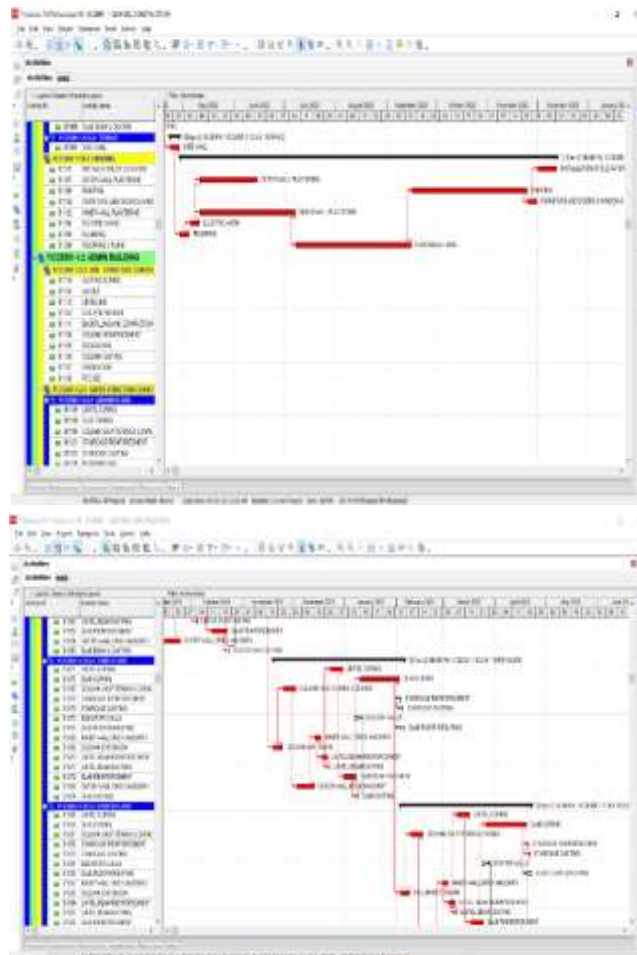


Fig. 6 :Tracking Progress of project

VI. CONCLUSION

The main objective of this study was to effectively manage the construction process of a school project using Primavera P6 software. This objective was accomplished through an in-depth revision of the kinds of literature and methodologies involved in project management. Effective planning and scheduling help in accurately predicting future situations and therefore the implementation of the project is carried out satisfactorily with the usage of Primavera P6 software. Primavera P6 allows us to perform a task with more simplicity by providing user-friendly options. It helps in effectively scheduling the project by assigning two relationships at a time to each activity and considerably reduces the float. During the construction process on the site, a lot of dynamic changes are to be made quite frequently due to the lack of resources, this obstacle can be avoided with the help of the Primavera P6 software which allows us to take sensible decisions properly by already forecasting the various problems that can cause the delays in the construction process. The school project consists of the construction of various structures. Thus the planning, scheduling, and management of all these structures are to be done very carefully as it may cause over-allocation of resources as the resources available are limited. It is very complex to optimize all the resources manually, so, Primavera maintains proper resource optimization and hence reduces the chance of over-allocation in an ongoing project and thus it helps to manage multiple tasks simultaneously. Primavera keeps a proper track of the efficiency of all the types of resources, cost control, and time management and hence provides us with a detailed budget of the project. The overall project management is more efficient, less time-consuming, and less complex than the conventional methods if done with the help of Primavera P6 project management software. Hence Primavera P6 software is one of the best tools available for planning, scheduling, monitoring as well as managing a project efficiently for satisfying results.

VII. REFERENCES

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