Planning, Scheduling and Tracking of Industrial Project Using Primavera P6 Software

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Abstract- **Proper planning and scheduling is very important part of construction projects for reducing and controlling delays of the project. Substantial amounts of time, money and resources are wasted each year in a construction industry due to improper management of construction activities. With globalization the construction projects have become vast and very complex. Planning of such projects requires huge amount of paperwork and time, which can be reduced with the help of project planning software. Providing good planning, proper organization, sufficient flow of resources to a project cannot automatically achieve the desired result. A warning mechanism must be present, which can alert the organization about its possible success and failures throughout the project. The main objectives of this study are to plan, schedule, and track an industrial project with the help of primavera P6 software and study the results generated. Also to recommend measures to the organization for enhancing their project planning skills for similar projects in future.**

Index Terms- **Planning, Scheduling, Tracking, Project Planning Software, Primavera P6.**

I. INTRODUCTION

The construction industry is an integral component of a nation's infrastructure and industrial growth. Many problems and issues are being faced by the construction industry, the majority of them are cost overruns and time overruns due to inadequate project formulation, poor planning for implementation and improper management during execution. Observations show that proper skillful management is essential for a project to complete within time, estimated budget and with allocated resources. Providing good planning, proper organization, sufficient flow of resources to the project can automatically achieve the desired result. A warning mechanism must be present, which can alert the organization about its possible success and failures throughout the project.

Project Monitoring acts like a warning mechanism; it is the process of recording, collecting and reporting information regarding project performance that the project manager and others wish to know. Monitoring includes watching the progress of the project against time, performance schedule and resources during actual execution of the project and it identified the lagging areas which require timely attention and actions. Large projects become more complex and the ability to exchange information on paper within the organization on a timely basis gets difficult.

The traditional project management system cannot meet the demands of today's projects, as a tremendous amount of information and data on a project is always changing.

II. OBJECTIVES OF THE STUDY

Following are the main objectives of the study.
1. To carry out scheduling using Primavera P6 V7.0 software
2. To create the baseline for the estimation of work progress
3. To track and update project on specific frequency
4. To carry out earned value analysis of the project

III. PROJECT MANAGEMENT

Project management is the Application of knowledge, skills, tools & techniques to project activities in order to meet all Project requirements. The elements of Project Management control include programmed objectives, policy restriction, resource constraints, government regulations, feedback and revision of

objectives. Planning a project includes the following: working out when, where and who is going to do the project. The crucial part of successful Project Management, however, is the actions you take after the project plan is created. Using Project Management software you can organize your project and recognize potential problems. Project Management software is used for making project management easier, especially when you encounter difficulties.

IV. RESEARCH METHODOLOGY

Research methodology is designed in three stages:
A.   Pre Data Collection Stage
B.   Data Collection Stage
C.   Post Data Collection Stage

Figure 1 Activity Table

A. Pre data collection stage:
This stage consists of literature review, setting of objectives and problem statement and based on that

selection of research area has been done. For the research purpose, industrial project is taken as a case study.

B.   Data collection stage:
Frequent site visits were carried out to identify the construction sequence of the industrial building and also practical time durations for executing activities were worked out. The data require for conducting analysis in the software is collected. Updating was carried out every week.

C.   Post Data Collection Stage:
The data collected will be analyzed in Primavera software and results generated from the software will be studied and interactions with the organization will be made regarding selection of the planning procedure and software to be used in their future projects. For analysis purpose EVM method will be used.

V. DATA COLLECTION

Data was collected by arranging meeting and by interviewing the senior engineers of the construction company. Data like labour output, activity duration, resources required for different activities are collected.
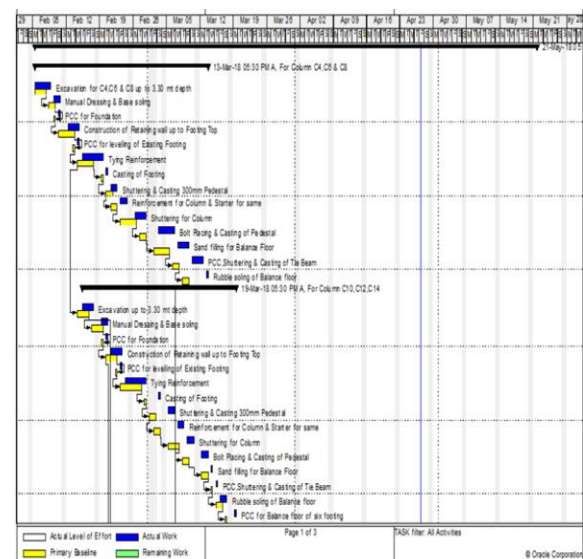

Figure 2 Bar Chart

VI. EARNED VALUE ANALYSIS

Earned Value Analysis (EVA) technique was used to track the progress and status project and to predict

future performance of the project. EVA technique integrates the scope, schedule and cost of the project. EVA technique answers a lot of questions to the stakeholders in a project related to the performance of the project. EVA technique can be used to show past performance of the project, the current performance of the project and predict the future performance of the project by use of statistical techniques.

Figure 3 Resource Sheet

Proper planning coupled with effective use of the EVA technique will reduce a large amount of issues arising out of schedule and cost overruns. The basic elements of EVA are mentioned below

1. Planned Value (PV)
2. Actual Cost (AC)
3. Earned Value (EV)

Based on the above basic elements other EVA (Earn Value Analysis) parameters are calculated. Other parameters are:

1. Schedule Performance Index (SPI)
2. Schedule Variance (SV)
3. Cost Performance Index (CPI)
4. Cost Variance (CV)
5. Budget at Completion
6. Estimate to Complete
7. Estimate at Completion Cost

To Calculate	Formula	Value	Interpretation
Schedule Variance (SV)	SV = EV-PV	-428009.14	Behind the schedule
Schedule Performance Index (SPI)	SPI = EV/PV	0.95	Behind the schedule
Cost Variance (CV)	CV =EV−AC	-290701.33	Over the budget
Cost Performance index (CPI)	CPI = EV/AC	0.97	Over the budget
Estimate at Completion (EAC)	EAC = BAC/CPI	10229218.80	Over the budget
Estimate to Complete	(BAC−EV)/ CPI	1117230.53	Over the budget

VII. CONCLUSION

Following are the conclusions from the study:

1. All project managers are aware of earned value management to help cost control. Using this concept to track a real-time project is extremely useful and gives an instant feel about the performance of the project.
2. The expected outcome of the project will show the difference in scheduled performance and actual performance of the project for a particular period of observation. Based on the performance, we can find the reasons for variance of schedule and variance of cost; also we can predict the future of the project.
3. This study also indicated that EVM has significant value and presents unique features that can benefit clients, consultants and contractors involved in the wide range of construction industries.
4. EVM keeps the project managers on alert on any mishaps to take corrective actions on the right time.
5. It also provides an efficient way to manage risks in a construction projects and try to avoid them in future projects.

VIII. FUTURE SCOPE

This study has emphasized on the performance of an industrial building and provided useful understandings on different aspects related to EVM methodology. Despite the sample size being small, it is assumed that the study gives a fair overview of construction projects. Similar studies can be performed to evaluate the project performance of Infrastructure projects. There is wide scope for

developing a project management software which could produce pictorial representation of EVM parameters for different activities based on the variances and indices directly without involving complexity of variables and can be interpreted by lower management.

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