Performance Evaluation of Kollam Bypass Road Construction Kavanad to Kallumthazham Stretch

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Abstract: Performance evaluation of Kollam bypass road construction is done by using primavera p6 software and survey and questionnaire method. Bypass road under construction in the NH 66, 13.141 km long bypass starts at kavanad in the north to mevaram in the south via Aravila, Kadavur, Kallumthazham and Ayathil. Constructions of three bridges are going on – a 900 m one at kandachira, 600 m one at Aravila and a 100 m one at Kadavur. The importance of kollam bypass is, it will touch 3 major National Highways, NH 66(Panvel to Kanyakumari), NH 183(Kollam to Dindigul) and NH 744(Kollam to Madurai) passing through the state of Kerala. Firstly collect the required information from PWD and then schedule the project by using primavera and do the performance evaluation by survey and questionnaire method. The performance evaluation includes whether the project is on schedule or behind the schedule or ahead of schedule and also the project is on budget or under budget or over budget.

I. INTRODUCTION
Construction planning is a fundamental and challenging activity in the management and implementation of construction projects. A good construction plan is the base for developing the construction activities, schedule and the budget for projects. The necessary aspects of construction planning include the generation of required construction activities and the choice among various alternatives for performing the activities. Schedule gives an overview of expected progress of the project. Without schedule, it is very difficult to explain to someone who is unfamiliar with the project what is going on and what is expected to take place. Primavera is a project planning software used for getting a perfect planning schedule. Construction of three bridges is going on of spans 620 m at Kandachira, 95 m at Aravila and of 826 m at Kadavur. Construction of road pavement and 3 bridges are taken for study and performance evaluation is done in terms of schedule and cost by using primavera software and direct interview with the concerned authority of the project.

Construction of “Project Highway” is 13 km in length which includes
- Widening of existing alignment 4.5 km length
- New alignment with paved shoulders of 4.58 km length
- Three bridges of 1.54 km length
- New alignment with RE (Reinforced Earth ) wall of 2.37 km length

II. OBJECTIVES
The main objectives are,
- To identify the construction sequence for bridge and road construction
- To work out the practical duration required to carry out the activities
- To develop schedule using primavera project planners software
- To evaluate the project by direct interview method and analyze the reason for delays and variations in estimated budget
- To suggest suitable measures for improvement

III. METHODOLOGY
1. Site investigation
2. Collect the required information from authorities
3. Schedule the project by using primavera
4. Updating the schedule
5. Performance evaluation in terms of schedule and cost by Direct interview method
6. Suggest suitable measures for improvement

IV. SCHEDULE USING PRIMAVERA
a. Creating OBS: The organizational breakdown structure (OBS) is a global hierarchy that represents the managers responsible for the projects under construction. Organizational Breakdown Structure for the bypass project is constructed with the organizers in their hierarchical order such as CEO, engineer, assistant engineer, quantity surveyor and site supervisor.

Fig. 1 Organizational Breakdown Structure
b. Creating EPS: Projects are arranged in a hierarchy. Enterprise project structure is created by splitting the project into three stretches such as Kavanad to Kallumthazham, Kallumthazham to Ayathil and Ayathil to Mevaram.

![Fig. 2 Enterprise Project Structure](image2)

Fig. 2 Enterprise Project Structure

c. Define the selected area for study: Kavanad to Kallumthazham stretch is taken. In that stretch, performance evaluation of three bridges and road is done. Therefore these three bridges and road are created as different projects in primavera.

![Fig. 3 Project selected for study](image3)

Fig. 3 Project selected for study

d. Creating WBS for each project
This is systematic means of defining the activities so that each activity can be readily identify by its WBS number. The WBS numbers build intelligence into the activity ID number. The numbering system is typically unique for a company or project. First three bridge projects are broken down into substructure and superstructure.

![Fig. 4 WBS for Kavanad bridge (project 1)](image4)

Fig. 4 WBS for Kavanad bridge (project 1)

e. Scheduling and Cost estimation: Scheduling is done with the practical durations and quantities for each activity. Cost estimation is done with the CPWD schedule of rates and the quantities calculated for each activity.

![Fig. 5 Scheduling details screen shot for substructure for project 1](image5)

Fig. 5 Scheduling details screen shot for substructure for project 1

![Fig. 6 Scheduling details screen shot for superstructure for project 1](image6)

Fig. 6 Scheduling details screen shot for superstructure for project 1

f. Plot the Gantt chart for all projects: Graphically show the progress of a project. Gantt charts are plotted for each project from their schedule using primavera. Activities shown in red colour indicate the critical activity of the project.

![Fig. 7 Gantt chart screen shot for project 1](image7)

Fig. 7 Gantt chart screen shot for project 1

V. PERFORMANCE EVALUATION
Performance evaluation of the project can be done by updating the project. Updating shows that whether an activity is completed or in progress or not started. By direct interview method, interview is conducted with the project manager and site engineer and the activity status is obtained. Thus the schedule gets updated and Gantt charts are plotted.
VI. RESULTS AND DISCUSSION

The schedule starts at 2016 May and ends on 2017 November. By direct interview method, project is behind schedule with reference to certain activities such as precast girder casting and laying, Casting and laying of deck slab, Construction of granular sub base courses on RE wall portion etc. and in the case of cost, there is no difference between the budgeted cost and the actual cost for the work completed. Delay in construction projects is considered as a typical issue bringing in numerous negative consequences for the projects and taking on an interest parties. Along these lines, it is crucial to distinguish the genuine causes for delay, keeping in mind the end goal so as to minimize and dodge the delays and their related costs.

Causes of delay in the project schedule are:

- Delay I design and approval of drawings
- Inadequate early planning
- Non-availability of red earth for filling the cutting in the RE wall portion
- Under budget due to stage payment may led to financial crises and thus it affects the construction activities
- Unsuitable weather condition
- Activities on the critical path was delayed

Proper corrective measures must be taken to finish the project as planned. The corrective measures may include

- Crashing of duration
- Over time work
- Reduce the percentage of work to be completed for obtaining the stage payment
- Provide easy availability of red earth by proper preplanning

VII. CONCLUSION

Primavera is an amazing project management software tool which is not just used by project managers, also used to managing complex construction projects. Cost and time are considered to be most important and critical because of their direct economic implications if they are unnecessarily exceeded. In Kollam bypass road construction project, project is behind schedule with reference to certain planned schedule activities and in the case of cost, there is no difference between the budgeted cost and the actual cost for the work completed. Causes of delay in my project are identified by direct interview method and suggest suitable measures to overcome the construction delay.

REFERENCE

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