



Literature Review on Implementation of Primavera Software on Road Construction Project

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Abstract -Road construction planning is a basic and challenging task in the management and execution of construction projects. A good construction plan is the basis for developing the budget and the schedule for a project. A considerable amount of time, money and resources are wasted each year in a road construction industry due to an improper management of construction activities. Time and Cost are the two fundamental parameters in the execution of the road construction. Providing good planning, proper organization, sufficient flow of resources to a road project cannot automatically achieve the desired result. The Primavera P6 software provides a warning mechanism, which can alert the organization about its possible success and failures throughout the project. The main objective of this study is to know the importance of road construction planning with the help of **Primavera P6 software**. Also put forward measures to the organization for enhancing their project planning skills for similar projects in future. The aim of this review paper is to promote the use of Primavera P6 in construction engineering and help the young engineer or learner to get an idea about the software.

Key Words: Planning, Proper Organization, Warning Mechanism, Primavera P6

Introduction - Road Construction make a essential contribution to economic development and growth also bring important social benefits. They play a vital role in order to make a nation grow and develop. In addition, providing access to employment, social, health and education services, road network plays a crucial role in fighting against poverty.

Management of the road work involves the application of engineering, financial and management practices to optimise the level-of-service outcome in return for the most cost-effective financial input. Indeed, the main objective of project planning is simply to apply the right treatment at the right time to accomplish the intended degree of service, suggesting that road infrastructure is a societal and economic financial asset. Primavera P6, owned by Oracle, is the sophisticated and effective project management tool which allows the engineers to plan, monitor and control the construction projects. As road construction involves huge cost, time and effort so scientific calculation of facts and figures are required for that purpose no construction firm can work without proper planning. This planning helps the site engineer, contractor and the client in better understanding of the project in terms of cost, time and resources. This management tools is very helpful to execute the project in a very economical way as well as with the limited duration with usage of optimum resources.

Literature Review-

The following are the previous research review based on planning, scheduling and tracking of construction project using primavera P6 software.

“A study on resource planning in highway construction projects” k swarna kumari and j vikranth international journal of engineering research and application volume 2, issue 4 july –august 2012. The present scenario of construction practices in India still adopt the methodology of as and when required resource management. Which results in Lack of professionalism, training programs no real time records. Equipment cost for any project mainly comprises of 20-30% of project cost.

Bhosekar and Subramani et al. (2012) stated that Earn Value Analysis (EVA) includes unique characteristics that help project owners, consultants, and contractors. From the comparison of result of Microsoft Project and Primavera P6 they found that the final result gives almost 99.5% accuracy.

Mohammad and Devanand et al. (2014) Made “analysis on resource planning, cost estimation and tracking of project by earned value management” by taking a duplex apartment as a case study. The key focus was on planned expenditures and actual cost.. Earned value concept explore the future opportunities and it also examines actual accomplishment. So the key point here that EVA that enable us to spot a potential problem early in the project and rectified the situation that rose in the project.

“Preplanning And Scheduling Of Road Construction By Using PPM” T Subramani, M.Shekar International Journal Of Application Or Innovation In Engineering Management, May 2015. Planning project management is required to give complete project management solution , helps to schedules the working period in a proper manner and also purchase the goods at the right time. Advantages of using this software are having flexibility to manage multiple projects in centralized location and determine who can access each project.

Unmesh and Rohith et al.(2015) has explained about the proper “planning, scheduling and tracking of a residential project using primavera software”. They defined project monitoring is like a warning mechanism which includes monitoring the project with respect to cost and scheduling performance and resources used during the execution of the project.

B.S.K.Reddy (2015): they did resource optimization exercises on on-going projects in Dubai, UAE. They individually levelled and then combined option with aggregated and then levelled clearly indicates reduction in demand of resources by 5.65% in later option, which could be best considered for economy. They concluded Resource levelling at project job site and forwarding demand leads a possible sharing of resources among projects.

Y.Umesh(2015)- Proper planning and scheduling is very essential in projects for sinking and scheming delays of the project. Extensive amounts of time, money, resources are wasted each year in a construction industry due to improper planning and scheduling. With globalization the construction projects have become infinite and complex. Planning of such projects need huge amount of documentation work, which can be minimize with the help of project planning software.

Ahmed et al. (2016) found that with the help of Primavera Software profit outcome of the project can be increased. They also identified that 5% reduction in the cost of labour can be achieved with the use of Primavera software.

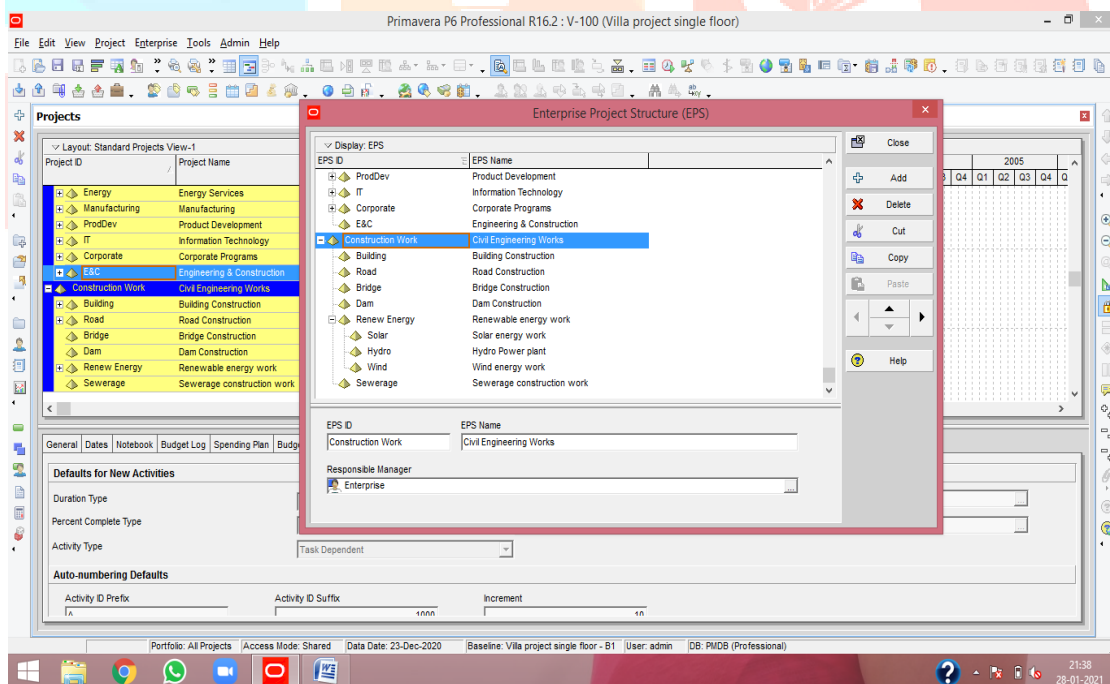
Chiranjeevi et al. (2017) stated that the earn value management is a program evaluation approach that track the project in a better manner. Better project performance evaluation can be done using earned value performance indices such as Schedule Performance Index (SPI) and Cost Performance Index (CPI).

Chaitali B Guledagudd and Vijay B G et al. (2018) At present situation in India, there is an massive increase in demand for road construction projects. We have noticed many underperforming projects in terms of cost and schedule. To get over this poor performance, we should overcome improper planning, scheduling and monitoring techniques being followed. For best planning, scheduling and monitoring techniques we can use Primavera P6. It is a proper project management solution not only in civil engineering but also use in various other fields like mechanical, information science, electrical, industrial etc.

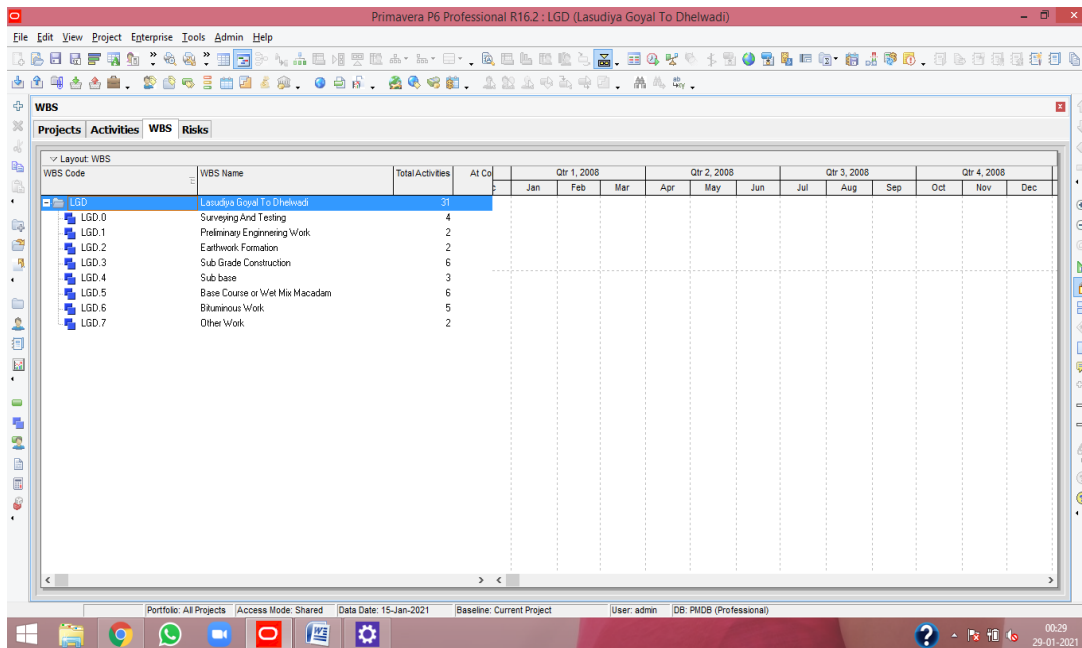
Maheshwar S Maregoudru and Monish Kumar et al.(2017) Cost Analysis of Road Construction Project by Earned Value Analysis using Primavera P6' The results are obtained from the software as well as by manual formulae are accurate to nearer values. The cost parameter results obtained from the analysis in primavera has given positive results and that will help to the company in future projects

Features of Primavera P6 Software -

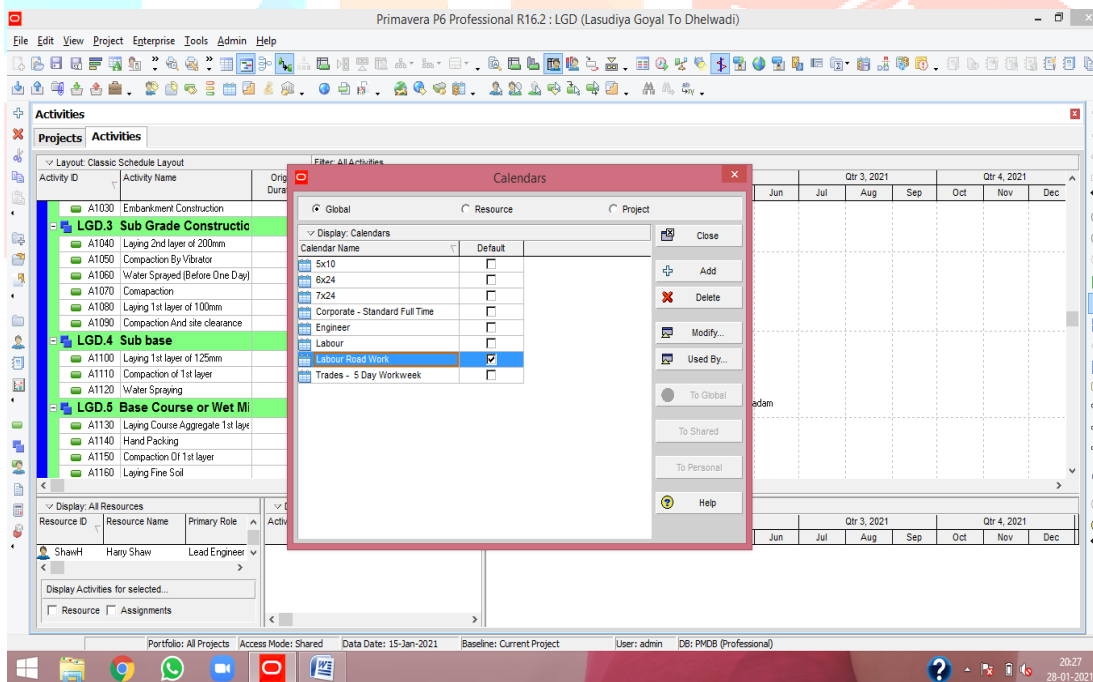
- 1. Scheduling-** To create an ideal schedule the basic step is to collect contract document, bill of quantities or DPR and calculate the out-turn of the resources.
- 2. Enterprise project structure(EPS)-** The EPS is a hierarchical arrangement of all the projects of a company. This provides a better view of all the current and future projects.



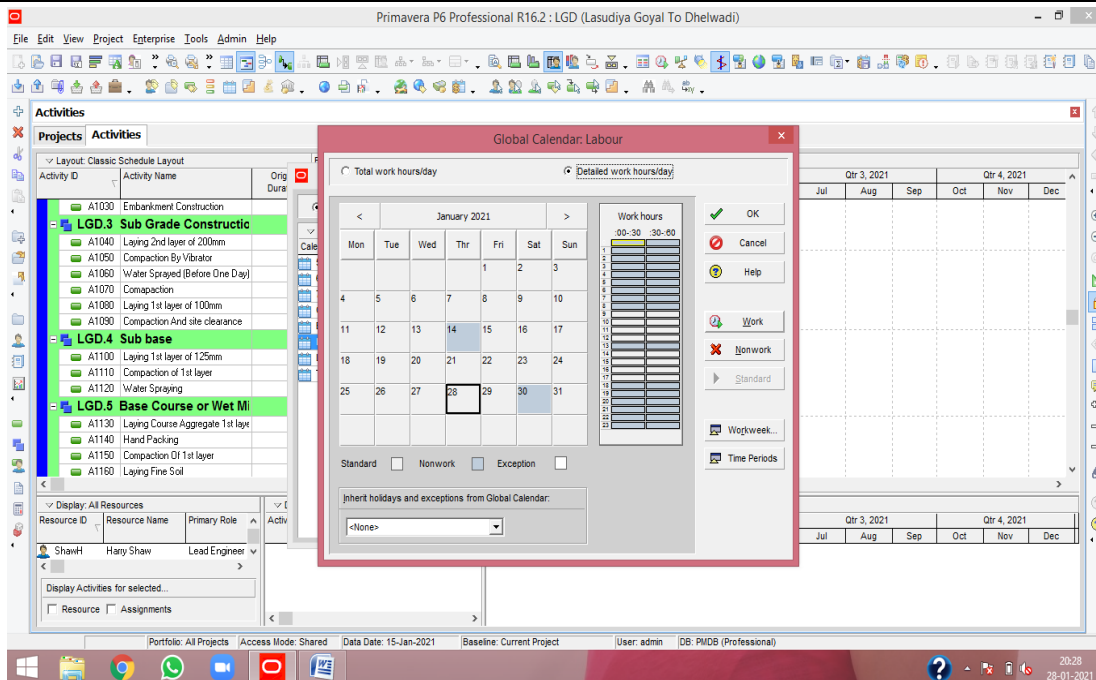
3. Work breakdown structure(WBS)- Breaking work into smaller tasks is a common productivity technique used to make the work more manageable and approachable.



4. Calendar- Three types of calendar are defined : global, resource and project. The calendar is created as per company policy and national holidays. We can assign global or project calendar to activities and resource or global calendar to resources as per our convenience.

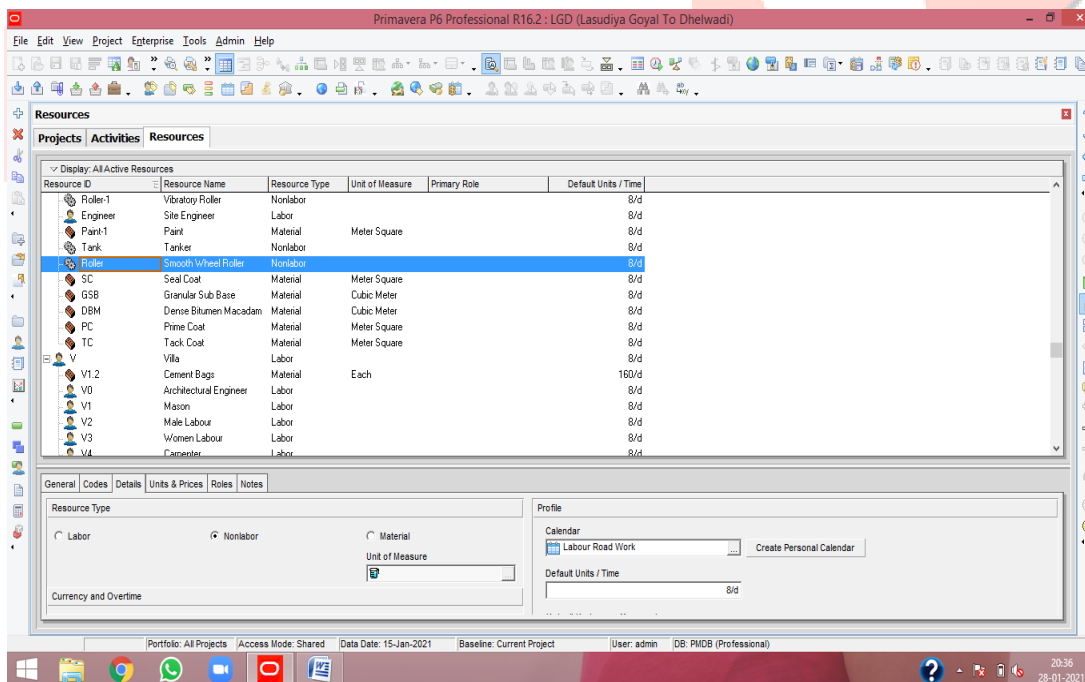


Calendar Assigning Interface

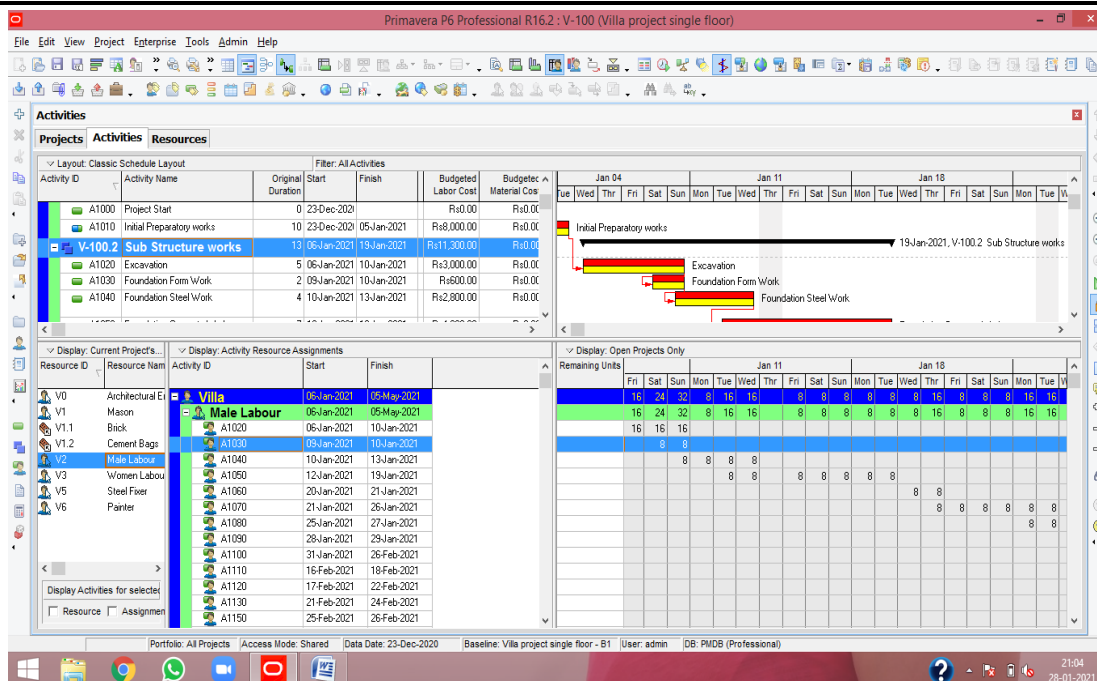


Calendar Modify Interface

5. **Activities-** Activities are the fundamental work element which consume both time and cost. An activity has following characteristics like activity id, name, activity codes, resources, roles etc. The activities in primavera are of 6 types.
6. **Resource-** Resources include the labour and equipment/material that is used to perform a task/activities. Resource has following characteristics like resource id, name, type, default unit etc. Also resource usage profile, resource usage spreadsheet, resource graph helps the contractor in managing resource.



Resources Assigning Interface



Resource Usage Spreads

- Baseline-** A baseline in Primavera P6 defines starting point for a project. It acts as a fixed reference point to monitor and evaluate the progress of the project. In primavera, we can assign unlimited baselines, whereas MS project allows for 11 baselines only.
- Earned value Analysis(EVA)-** The EVA is a unique feature of Primavera P6 for measuring project performance according to both project cost and project schedule. The technique compares the budgeted cost of the work to the actual cost.
- Risk and Opportunity Management:** Project Managers can easily identify when risks may occur, and the impact of these risks shows in the project's baseline and schedule. Initial and recurring risk is conducted by project managers and also opportunity analysis is done within the schedule.
- The Responsibility is given to Employees in Schedule Creation:** The software allow the user access to the schedule, Primavera makes the planning and scheduling method easier. Also, workers from their location can create their schedules in the software by using user id and password. Also, they can turn in timesheets, perform other scheduling functions, and make schedule requests..

Conclusion-

From the above literature review, we can conclude the following things:

- Planning, scheduling and tracking of multiple construction project can be done efficiently using Primavera P6.
- Primavera provide flexibility in handling multiple project at a time.
- The resources which are the soul of a construction project can be manage effectively as it comprises 80% of the project cost. Money on resources are wasted due to improper planning and scheduling.
- Gantt charts will give clear picture for site engineers regarding execution of activity and be prepared for upcoming activities.
- The cost of labour can be reduced by 5%, by proper management of resources.
- Better project performance evaluation can be done using earned value performance indices such as Schedule Performance Index (SPI) and Cost Performance Index (CPI).
- The primavera P6 software is very useful in resource levelling and resource smoothing.

8. The Primavera software provide a better understanding of the project as compared to traditional method also less paperwork and it is time-consuming.
9. Earn Value Analysis (EVA) has unique features that benefit clients, consultants and contractors involved in the project.
10. The resource graph and resource usage sheet obtained for both labour and material will help the contractor to manage the requirements for the activities.

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