

A Comprehensive Review on Cost Optimization by Resource Allocation Using Primavera

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Abstract: Resources play vital role in construction projects. The performance of construction industry depends chiefly on how best the resources are managed. Optimization play pivotal role in resource management, but task is highly haphazard and chaotic under the influence of complexities and vastness. Management always looks for optimum utility of resources available with them. Hence, the project management has got important place especially in resource allocation and smooth functioning with allocated budget. To achieve these goals and to exercise enhance optimization certain tools are used for resource allocation optimally. Implementation of construction project needs a proper planning and scheduling is of vital importance for the project to be executed and run smoothly. A best schedule has to be prepared in such a way that meets the primary objectives of the total project. Those essential destinations are to make a quality venture, finished on time, inside spending plan, and in a sheltered workplace.

Keywords: Primavera, Project planner, Optimization of resources, Resource management, Resource levelling, Resource Allocation, Project Scheduling

I. INTRODUCTION

The development of infrastructure plays a main role for the development of country. The important part of economic growth of the country depends on the road transportation. The construction projects like road construction needs a careful attention while planning as well it requires a very huge amount of resources.

As it's known the road construction projects is different from one another as there will be changes in place, situation, weather condition by seeing all this it is very tedious in planning and allocating resources as the resources are repetitively used in the execution of the project.

The time taken for the construction of road projects at the beginning of 19th century took a very long duration because of lack in techniques used which leads to wastage of money, time as well as the resources used for construction. As the days passed their we saw the improvement in the construction technologies used which could complete the project with the appropriate usage of money, time and resources for these improvements their comes the proper project management tools which would help in planning, scheduling and resource allocating one such tool is Primavera P6.

A. Project Planning

Project management could play a very important role in the construction industry. By using these management tools it will be very helpful to execute the project in a very economical way as well with the limited duration with usage of optimum resources. This also enables to store the information and manage the project in a central location. The project management consist of balancing the needs which could be identifiable or unidentified expectation of the stake holders by giving the quality, scope, and time of the project. The project management uses the information and turns it in a manner for execution in a skilled way with lot of strategies to satisfy the requirement of the construction projects. Every project has main goals to achieve that are:

- On time project completion
- Optimal usage of resources
- In minimum investment

The goal of project planning is to create a work chart with the activities which should be done on after another with a proper date of start and completion. By scheduling we could know the activities which are in a crucial position where it should be started and completed within the duration so that

it will not affect the project completion duration. The allocation of the resources required for the project activities will cut down the wastage of materials which could affect the funds that are allocated for the resources in a project.

B. Scheduling

Scheduling refers to slotting out the time duration by the thorough and explicit analysis of the planning team to each and every activity to know the final project duration and the project delivery date. In other words it governs the timing of each work activities recognized by the planning process before or during project execution. Typically, it shows and signifies the sequential order or phasing various individual project activities in a systematic way to complete the project. The schedule is a tool or a technic of every project management team which is used and practiced to predict most probable project completion time and thus enabling the in/ on time resources conception which are budgeted on the particular work. The general steps to develop a proper schedule are as follows:

1. Proper time estimation of every activities.
2. Project planner should know the obligations of time for the project completion and delivery.
3. The activities such as must start and must finish should be establish well recessed.
4. Sorting out of activities which are crucial to timely completion of project should be recognized and kept in mind.

II. PRIMAVERA

Primavera is an undertaking venture portfolio administration programming. It incorporates venture administration, item administration, cooperation and control capacities, and coordinates with other endeavor programming, for example, Oracle and SAP's ERP frameworks. Primavera was propelled in 1983 by Primavera Systems Inc. It can perceive principles for elite undertaking administration programming, is intended to deal with extensive scale, very advanced and multifaceted activities. P6 Professional can be utilized to sort out tasks up to 100,000 exercises, and it gives boundless assets and a boundless number of target designs. Huge information requires complex yet very adaptable association apparatuses to give you a large number of approaches to arrange, channel and sort exercises, ventures, and assets.

Advantages:

- Balance resource capacity
- Plan, schedule, and control complex projects
- Allocate best resources and track progress
- Monitor and visualize project performance versus plan
- Conduct what-if analysis and analyze alternative project plans.

- It is very helpful in planning and scheduling of the projects quickly and conveniently.
- It recognizes the available floats and determine the all possible critical paths by the project.
- In this software there is facility to get the attractive customized colorful Gantt charts, network diagrams, histograms and time based logic diagrams.
- It creates principal program schedule by integrating the schedules from owners, engineers, architects, planners and subcontractors.
- It controls budgets, estimates even after changes at finishing point to relic successful delivery of the project.
- It enables spot and instant planning for the forthcoming days, weeks, months, years and so on and activities.
- Application of works to allocate the resources for the activities can be done precisely to haunt how the work is carried.
- Improves relationship and alliance by timely E-mailing to the concerned entire project.
- It expedites the communication related to project status to the stakeholders, contractors, owners and other project management team members by customized reports of industry standards.
- To build any kind of new projects lowering of templates
- is the best practice to follow up and it is even helpful for the complete project as well
- By using earlier performance of activities in the project earned value analysis can be done to see the future more accurate cost to completion.

III. LITERATURE REVIEW

To provide a detailed review of the literature related to project management in its entirety would be difficult to address here. Although there has been a lot of work modeled as construction management considering resource allocation. A brief review on primavera a management technique and code provision of previous studies is presented here. This literature review focuses on project management system used in construction field will be addressed by area.

Bagade et. al. [1] explored that Planning, booking and Resource leveling assumes an imperative part in any development venture perhaps it is development of building or development of street. Without appropriate arranging, booking and asset leveling development industry does not get benefit over the venture. For this reason, legitimate programming's and methods must be use. This paper is focusing on the benefits of Oracle Primavera P6 Software. The most recent rendition of Primavera is P6-17. In any development work tremendous measure of printed material is required, which makes the administration extremely

oppressive. By utilizing Oracle's Primavera P6 Software printed material can be decrease, bringing about diminishment of weight. Primavera P6 give change in development administration. Primavera P6 is the time redeemable device, with legitimate asset enhancement.

Ghadge et. al. [2] discussed that project cost is the one of the governing factor in project success. Project management is used to increase productivity in terms of human resource and materials. Earned value management (EVM) is a project performance evaluation technique which has been adapted for application in project management. The technique helps in comparison of budgeted cost of work to actual cost. The present study deals with the review of the project management involving earned value analysis.

Nimbal et. al. [3] considered that owing to an expanding setting of condition, Construction industry is ever forthright for the improvement and headway in instruments and gear highlights, apparatuses of correspondence, systems of effective administration, instructing the HR about it. This exceptional specialization requires profoundly engaged whose development was intended to begin at Pune, Maharashtra, India. Undertaking Planning and Controlling devices or systems. In the present investigation we actualized the PC based Project Management programming/apparatus Primavera P6 for the Planning, Scheduling and Allocation of assets for a (G+8) private condo building It knows the likeness between the arranged the arranged advance of development work and real advance of the performed work. In this way the centrality and the benefits of utilizing Primavera will be sketched out through the information comes about acquired. The acknowledgment of the product Primavera as a stage of booking is been on a blast in Multi National Construction Companies, yet because of obliviousness and absence of Project Management ideas and demoralize towards the utilization of PC based projects, little and medium scale Indian development organizations go up against different issues, for example, wasteful arranging, venture delays, wastefulness of assets and numerous different issues. In this way, we likewise endeavor to teach one such medium scale development organization about the upsides of Primavera in execution of any development extends proficiently.

T.Shiva Nagaraju et al. [4] discussed the role of scheduling and proper usage resources to timely completion of a construction project. Results showed the drawbacks of the present project management system in station work project and the importance of efficient planning, as well as the need and effectiveness of project management software like Primavera P6 in a construction project.

R. Kohli [5] reasoned that Efficient task administration is the need of great importance and it is the sole duty of the

undertaking director to guarantee the working of the venture as indicated by its dispensed spending plan and due dates. For any development venture, legitimate arranging, booking, compelling asset allotment and refreshing the exercises is to a great degree basic to improve the task and build up most extreme spending augmentation. Dishonorable planning, sporadic checking and poor treatment of the continuous exercises builds the venture term and sum with a significant edge. Subsequently, it is fundamental to embrace expansive scale administration extends effectively with the assistance of PC helped programming. The well ordered strategy to embrace an undertaking has been clarified and a definitive use of Primavera P6 Enterprise Project Portfolio Management (EPPM) has been condensed.

P.M. Wale et. al. [6] expressed that the undertaking may have a straightforward objectives that does not require numerous individuals or a lot of cash or it might be very perplexing, calling for different abilities and plenty of assets and furthermore gave similar examination between customary way and Microsoft venture arranging. They reasoned that Traditional route ends up being uneconomical and expends additional time with numerous complexity and gigantic mistake while Microsoft Project is the cutting edge apparatus of Project Management that guide to conquer the hindrances confronted attributable to conventional method for Planning and Management.

Shaik Mohammad Masood et al. [7] represented that numerous development venture experience the ill effects of time and cost overwhelms because of various elements. EVM is an erformance of task assessment which is utilized for the application in venture administration. This method helps in examination of planned cost of work to real cost of work performed

Hamed et al. [8] illustrated that every organization, at least, has four types of resources to be allocated in order to achieve organizational aims. These resources are: human resources, physical resources, financial resources, and technology resources. Resources should be allocated in an efficient and appropriate manner since success is achieved when plans, employees, performance, controls and commitments made act to maintain and survive allocated resources.

k swarna et al. [9] discussed the present construction practices in India is 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 comprises of mainly 20-30% of project cost man power planning is the process by which an organization ensures that it has the right number and right kind of people at the right place at right time. Which all

should be controlled by proper allocation of resources so that effectively and efficiently works can be completed.

IV. METHODOLOGY

The methodology used in this project is divided into 3 main phases. By adopting planning and scheduling the activities critical path will be obtained by schedule reports by logical relationship which will be helpful in execution. Resource availability can be known and assigned, analyzed and levelling will be done. The results obtained are concluded. The entire project is integrated with Primavera and reports are generated. Following flow chart explains the phases.

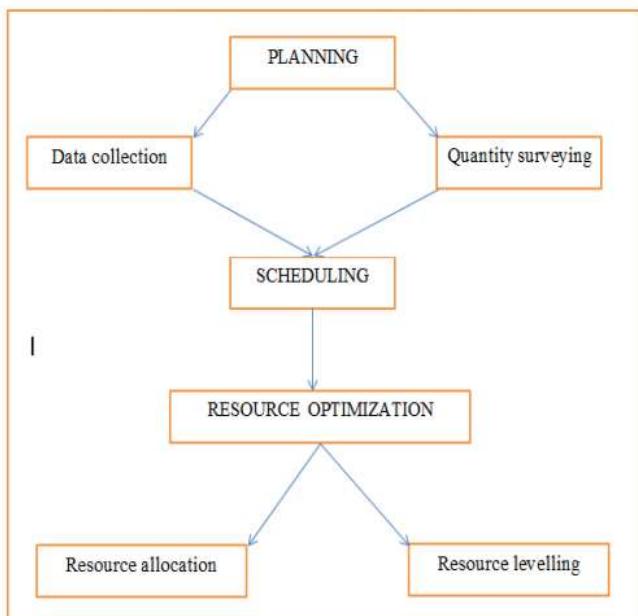


Figure 1: Showing the Phases of Methodology

V. CONCLUSION

In the present scenario there is an immensely increase in demand for the road construction projects due to the rate of development in India which is increasing day by day. In India as we have observed there are many underperforming projects which is effecting on time and cost. To overcome all the facts that are effecting the construction of project with poor performance there we should include proper planning and scheduling techniques to have a good and effective performance of the construction economically. So to include the best planning and scheduling techniques we can use Primavera P6 for the minimum duration construction of road construction. Primavera P6 gives a proper project management solution for the planning and scheduling team of the enterprise.

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