

# Resources Optimization in Construction of a Residential Apartment by using Primavera: a Case Study

Kottamasu L. N. Panakala Rao, K. Shyam Chamberlin

**Abstract:** Resource management is the main factor of project management in today's construction industries. Budget and scheduling factors purely based on the resources are effectively used in the construction. Project manager faces the problems such as resource planning and resource allocation in construction projects due to major projects. Thus, previous method of resource management system cannot handle present large projects. To conquer by the problems the software was introduced like primavera p6 can supervise the construction projects in appropriate way. This software will help in resource management and planning process of the construction project and avoids budget and scheduling over run. In the present study SREE LALITHA PRIDE at the location of Mangalagiri.

**Index Terms:** Large scale projects, Project Management, Resource planning.

## I. INTRODUCTION

In present days Construction projects are facing many challenges of administration project budget, scheduling, quality, safety and health to assemble the requirements programmed by the customer. Antagonism in construction filed always increasing and projects are always required to be complete on time, within the budget, and with particular safety and quality. Accurate consumption of external and internal resources is obligatory, for which the construction projects have to implement greatest business decisions and maximised business goals for improved continued existence in the active aggressive environment. Construction projects are facing main factors are scheduling and budget". Scheduling and budget are mainly based on the expenditure of available resource like materials used in projects and efficient organization, and proper planning at the within in the time and right place. In construction industries mainly three resources like resources, equipment, man power.

The total construction project completely depends on proper expenditure of available machinery and resource. If not appropriate expenditure of resource allocation and resource optimization the project budget and scheduling are increases. Present days India is one of the best growth construction industries country, at this point is extra dissimilarity in growth of urban and rural areas at this point require effectual project organization, a lot of trouble arises in construction production due to inappropriate organization, environment, non accessibility of resource allocation, poor scheduling which will property the project budget and scheduling. One of the easier said than done activities in the

construction industries are management resource materials. The resources allocations are mostly man power and resources. In construction projects the activities are different works will be executed every day, allotment of resource allocation for every activity is difficulty, from time to time it will be in overload of allocated, sometimes it will be a lesser amount of allocation all the above trouble construct optimization procedure is very problematical. Resource management purpose is mostly supplying and opinionated resource allocation to each performance of the project.

Construction projects can successful completed within the budget and scheduling mainly based on Resource. Project Resource preparation includes the resource allocation to different performance and levelling the resources. In projects resource allocation and resource levelling difficulty arises when there are adequate resources obtainable and it is necessary to decrease the fluctuations in the archetype of resource allocation practice. These fluctuations are very objectionable for the reason that they frequently consumption, nearby labour, and economic problems for the construction contractor. The project scheduling aim is to construct the resource allocation requirements as dependable make available as possible, or in various cases to formulate them competition attractive non-uniform resource levels in construction projects. There are no resource boundaries and the procedure is accomplished by potholed only the noncritical performance contained by their available resources; the project time period of the innovative important path remainder permanent

In construction projects is very complicated to do accurate planning and arrangement of resource allocation in this case number of performance is more hence it's very complicated, thus now days construction projects planning and arrangement will be done by software's PRIMAVERA and Microsoft project. PRIMAVERA software is highly developed software than Microsoft project software. it is comprehensively used software in the huge scale construction industries. PRIMAVERA software can administer hundred's of project at a time.

### A. Study Area Description

The present case study information was collected by visiting lakshmiinftratech and it's located at managaligiri. Information on the particular exertion and the resource optimisation of the enclosed commercial buildings were gathered from side to side casual interviews conceded out with the site engineers and managers to that project; and the

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architects of the projects as well as the manager of the disbursement and bills;. Secondly, the connected data such as project schedules, accessibility of resources allocation and resource prerequisite, time extension requirements of the contractor throughout the construction projects were collected from the interrelated departments of the project work and consulting related projects and the data was study and analysis in order to get comprehensive information about the construction course of action of the project. These data were compiled using primavera software and then the possessions essential for construction projects were optimized.

## II. RESEARCH SIGNIFICANCE

1. This project mainly aims to achieve optimum resources utilization and resource leveling by using primavera software.
2. To understand the importance of resource management technique.
3. Using the PRIMAVERA software for Resource management.

## III. RESULTS & METHODOLOGY

In previous days construction Project management was being conventional away by Project Evaluation method and critical path method. Present day's construction project is maintained by software's like Primavera software and MSP.

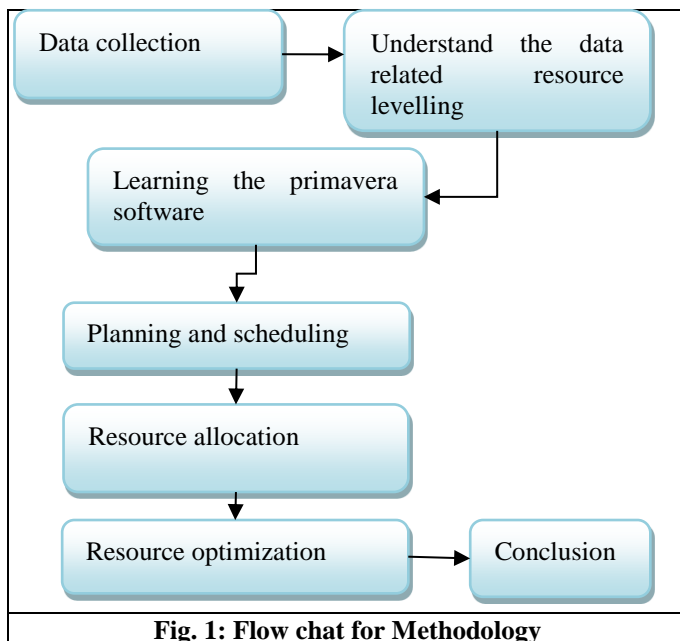


Fig. 1: Flow chat for Methodology

In that, Primavera software has been meticulous to administer the resource allocating which is used in the project and also optimized the obtainable resource the learning have been approved out in 2 stages, in first stage collecting the necessary information connected project and compute the quantities are assigned in Primavera with a number of definite interval to the requirement of assigned movement with high opinion to measure resource will be assigned to these performance and find out the over distribution resource and resource levelling will be performed. Fig. 1 shows the Overall methodology for the project.

### A. Data collection

Collecting the articles and research paper related to optimization of resources and same as to collecting the construction project details related resources used in that project. In that case collecting drawings of the projectand Quantity survey of the project.

### B. Understanding the data

After completion of data collection to understand the project resource and related software.

### C. Learning the primavera software

Learning the Primavera software to understand its features, functions and step by step procedure which helps to identifying the status of the project about budget of project and scheduling of project required to complete the remaining project while its construction.

### D. Planning

After collecting the data verifying the planning and quantities should be done.

### E. Scheduling

Procedure had to be completed. It involves developing a work break down structure (WBS), calendar and allotting extent for each movement.

The Calendar in my project is

- Eight hour working per day of labour as of morning 9am to 6 pm with one hour Lunch break
- Sunday is as well operational day intended for eight hours.
- Holiday's intended for labour is government holidays similar to Republic day.

### F. Resource Allocation

Subsequent to development, the resource counter is prearranged and this equipped resource are assigned to each performance of the project normally resource unconnected labour, UN skilled, and substance in the software. Possessions are designed based on the amount of the movement.

Fig. 2 gives the details of Resources that are used in this project.

Resource ID	Resource Name	Resource Type	Unit of Measure	Default Units / Time
RM1	RM1 PROJECT'S LIMITED	Nonlabor		1.000/d
RF3	(New Resource)	Nonlabor		1.000/d
CON	CONCRETE	Nonlabor		1.000/d
Cem	Cement	Material	Bags	8.000/d
San	Sand	Material	cubic metre	8.000/d
M 20 RCC	RCC M20 Concrete	Material	cubic metre	8.000/d
M 10 PCC	PCC M10	Material	cubic metre	8.000/d
Brk	Brick	Material	Numbers	8.000/d
Blk.msk	Block 8"X4"	Material	Numbers	8.000/d
Bld	Boulders	Material	Loads	8.000/d
Ln	Line	Material	Bags	8.000/d
Sz Si	Size stone	Material	Numbers	8.000/d
C Agg 20mm	Crushed aggregate 20mm	Material	cubic metre	8.000/d
Ear	Earth	Material	cubic metre	8.000/d
Stl	Stl Steel	Material	Tons	8.000/d
Stl Fab	Steel Fabrication	Material	Square metre	8.000/d
Tiles	Tiles	Material	Square metre	8.000/d
Paint	Paint	Material	Square metre	8.000/d

Fig. 2: Details of resource



G. Resource optimization and Results

We can't optimize or reduce the project material resource allocation other than we can optimize the man power resource allocating while leveling the different resource allocations, there are some probabilities in which one can optimize the source.

In this construction project dissimilar type probabilities are approved out are as follows

1. Level meticulous resource surrounded by hang Preserving planned near the beginning and not on time date
2. Level meticulous resource surrounded by hang preserving programmed near the beginning and not on time dates
3. Level all resource surrounded by hang conserved scheduled near the beginning and not on time dates
4. Level all the resource through Preserving scheduling near the beginning and most recent dates

IV. RESIDENTIAL APARTMENT TAKEN AS CASE STUDY

A. Leveling procedure

Following disappearing from side to side the entire probable alternative for this case learn in leveling modus operandi, the following are the graphical representation for the man power done in PRIMAVERA software.

Fig. 3 shows the Overall allocation of man power that is used for the project.

Fig. 4 shows the Resources that are used for the leveling of man power.

Fig. 5 shows the Overall allocated man power after modification.

Fig. 6 shows the result obtained after the optimization of man power.

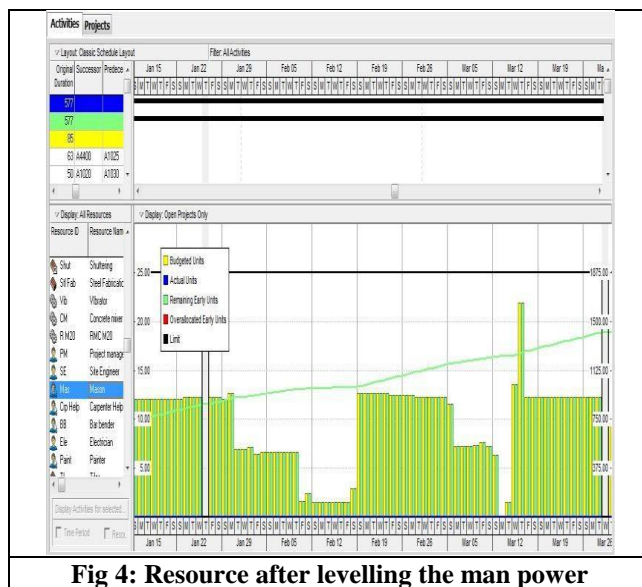


Fig 4: Resource after leveling the man power

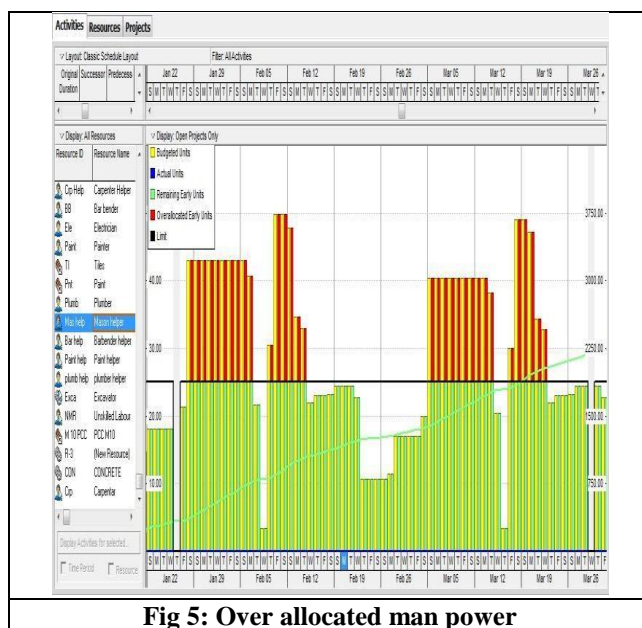


Fig 5: Over allocated man power

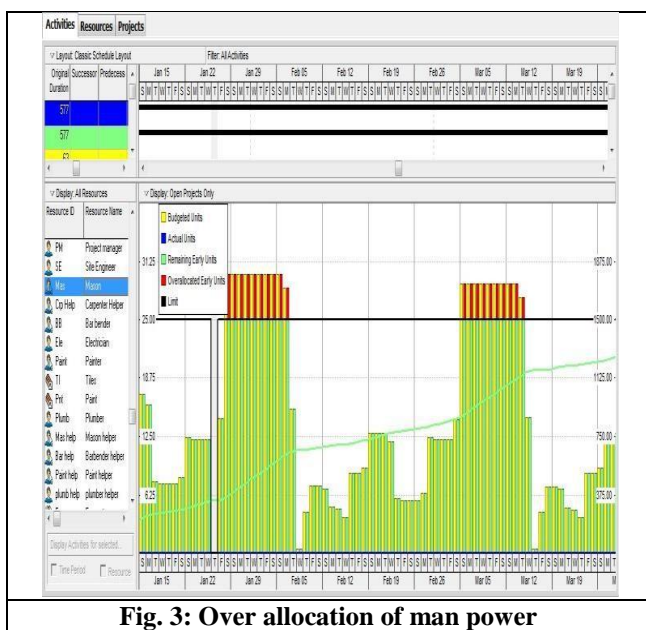


Fig. 3: Over allocation of man power

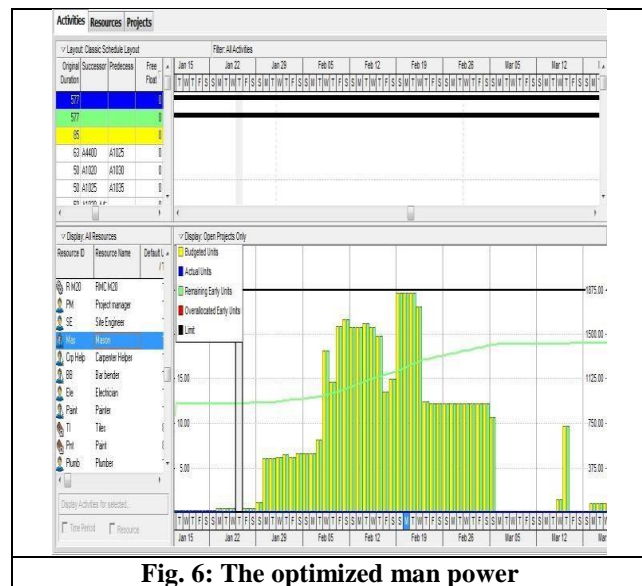


Fig. 6: The optimized man power

## V. CONCLUSION

The principle of this study on project resource allocation worn in the construction filed is to optimize or condense or to stay away beginning on wastages of the all materials in project. Resource allocation and same as resource optimization has been completed by means of project organization software similar to primavera p-6. Here labour as like man power, wood working as carpenter, unskilled labour like helper, water colourist, carpenter assistant, water colourist collaborator have been taken in to reflection for resource allocation and resource optimization for the reason that they are mostly used resources were institute as an greater than outstanding resources for a number of performance. Therefore resource optimization was complete to these resource materials and by changing the predecessors devoid of upsetting the interval of the project. These resources were levelled in such way that their allocation is well surrounded by upper limit ease of access.

The total project concludes the following grades.

1. The construction project resource allocation like to labours, unskilled labours, wood worker, collaborator, watercolourist, carpenter collaborator, painter collaborator in this case revision has been optimized. In such a way that they are not over outstanding of any of the activities in the project.
2. Resource allocation as optimized can be completed devoid of changing the project period
3. Resource allocation as Optimization can be done to all other resources which are used in construction project and can reduce the project cost.
4. Over allocated resource are reduced from the activities.

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