



ANALYSIS OF EFFECTIVE RESOURCE MANAGEMENT IN HIGH RISE BUILDING CONSTRUCTION PROJECTS BY PRIMAVERA PLATFORM IN PUNE CITY

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Abstract: One of the most crucial management duties is resource management, which facilitates the implementation of strategies. In organizations without a strategic management program, resources are distributed according to political or personal considerations. However, in organizations with a strategy-based approach, resources are distributed according to priorities established by yearly goals. Failure to link executive plans and establish the priority for allocating resources to strategic long-term programs is one of the key barriers to the effective implementation of organizational strategy. These days, the majority of organizations have separate procedures for annual and short-term budgeting. Four different sorts of resources must be distributed throughout all organizations in order to accomplish their goals. Every organization, at least, has four types of resources to be allocated in order to achieve organizational goals. These resources include financial resources, physical resources, human resources and technology resources. Resources may be allocated in an effective manner while success of strategy Implementation is not assured since success is achieved when plans, employees, operations, controls, and commitments act to maintain and survive allocated resources. In this thesis we study concept of resource management and apply this techniques for construction planning of high-rise building. Effective Utilization of Primavera is the best option for planning and scheduling of High-Rise Building. This paper focuses on effective resource management for high rise building with the help of software.

Keywords: Resource Management, Construction, High Rise Building, Material management, Primavera P6.

I. INTRODUCTION

Resource management is all about transparency so you can see, monitor, and attain what is required to deliver projects. It also enables you to minimize both idle time and overutilization of resources. With full visibility both work and resources, you can more effectively schedule, plan, and manage your resources, aligning them with the right projects at the right time. It is easy to see the importance of resource management by understanding the disadvantage of not having it. Without the right data, resource managers have little control over their projects and no way of understanding:

SIGNIFICANCE:

Resource management brings control to the chaos, ensuring managers are equipped to maximize resources and reduce unnecessary costs. You have the data you need to understand project and personnel costs for more accurate budgeting and planning. You are also able to maintain an ideal team of people – optimizing resources across projects based on skills and capacity. Ultimately, the greatest benefit of resource management is the effective and efficient delivery of projects to the end customer. Customer satisfaction improves when teams are able to fulfill project requests on time and as expected. Confidence in the ability to execute projects builds momentum, becoming a differentiator and providing a strategic advantage.

II) OBJECTIVES:

- To calculate Human Resources requirement and its allocation techniques in high rise building construction
- To study the material management techniques for optimization of material requirement in high rise building construction
- To estimate the scheduled date of project completion (of case study) by using Primavera Software.

III) LITERATURE REVIEW: The past researchers research in all aspects is covered in this literature review

a) ***Rational management Aspects***

Abhijit N. Bhirud (2020) Quality parameter plays critical part in tall rise building development ventures with regard to completion of development inside given budget and stipulated time length with ideal assets. To decrease basic components influencing on quality of tall rise buildings, legitimate monetary budget is apportioned for planned development exercises. Convenient supervision and checking of development exercises is done through location bosses, senior engineers and quality investigator as well as present day devices and methods. Solid smooth communication & coordination among diverse office like materials, HR, Hardware & accounts and people working on location makes a difference in moving forward quality of development. Quality mindfulness program and quality control strategies ought to be executed time to time for quality advancements in development ventures. Capable human assets makes a difference in redressing and diagnosing absconds or non-conformities watched amid diverse development exercises. Arrangements of actually competent venture directors as well as temporary workers are accommodating in progressing quality issues in tall rise building extend.

T. Kravchunovska (2020) Authors choose the rational management of the high-rise building construction projects, it is proposed to apply the approach based on the search for solutions that best correspond to the desired (assigned) technical and economic characteristics (indicators), based on the use of statistical modeling of projects as manageable processes. At the same time, when choosing a rational decision, it is advisable to take into consideration the influence of determining organizational-technological, technical, and managerial factors in compliance with the requirements on cost-effectiveness, energy-saving, safety, quality, and environmental friendliness. The structure of the organizational and technological factors include: reliability of a construction organization, the quality of a high-rise building.

K.A.Karthick Raja (2020) In this research The allocation of required resources is needed to complete a project within scheduled time. This paper presents the preparation of required labour resources according to the scheduled activities in construction of gated community and also presents resource constrained analysis which involves resource leveling and resource optimization. Based on the analysis time-cost variations were obtained. It was observed that, for decrease in resource constraints there is an increase in project durations from 368 days up to 378 days according to various resources. When the project duration increase, it apparently results an increase in total project costs from 0.006% to 0.093% accordingly.

SK. Nagaraju (2018) Author Stated that he nature of the construction industry is unique in characterized by complex deployment pattern of resources resulting in risk and uncertainty inherent in every phase of the project life cycle. In fact a state-of-the art resource management is essential for a construction project to succeed in fulfilling its project objectives. Allocation of resources for activities is necessary in construction domain to complete the project within the scheduled time. Resource leveling is needed in construction projects to avoid the difficulties associated with the large variations in resource usage. The paper presents a project schedule with time constrained due to the client's requirement. All the activities of the schedule are critical (total float zero). The only option to increase schedule time is possible by resource leveling. The resource type for this schedule is considered manpower (labour) only.

IV) DATA COLLECTION:**Project Attributes**

Project attributes presents the details of an ongoing project in terms of project schedule, manpower required for different activities to carryout resource constrained analysis. The costs incurred in the project are also presented.

Project Details:

Name of the project : 18 Latitude Construction of Commercial Building
 Built up area : 92000 sq.ft.
 Number of Storey : Ground + 6 Floors with Floor to Floor height: 3.35m
 Height of Plinth: 0.50 m above Ground Level (591)
 Depth of Foundation: 1.50 m below Ground Level.
 External Walls: 250 mm thick including plaster
 Internal Walls: 150 mm thick including plaster.
 Parapet Walls: 250 mm thick including plaster.

Summary of Analysis:

This investigation is completed in two stages. In the main stage, all the data and information expected to gauge assets were gathered. The development venture timetable utilizing the assessed assets was set up as Gantt diagram and assets required for every movement are organized. The pinnacle units required for a venture step by step are appeared in Resource histograms. In second stage, the genuine assets accessible for the venture were dissected by Resource leveling with expanded term. The time-cost suggestions have been investigated to caution the management The Leveler instrument enables you to plan exercises in a manner that lessens or kills over-burdens for assets relegated to more than one movement inside a venture or crosswise over numerous tasks. Undertaking administrators need asset and cost stacked work routines to make practical presumptions and conjectures for their task's objectives.

V) DATA ANALYSIS:

- In this graph, Red line represent that the Unskilled Labour are over located early units. i.e. Resource over Allocation Unskilled Labour. As other graph, blue represent Actual units, yellow represent budgeted units. And green represent reaming early units of Unskilled Labour.

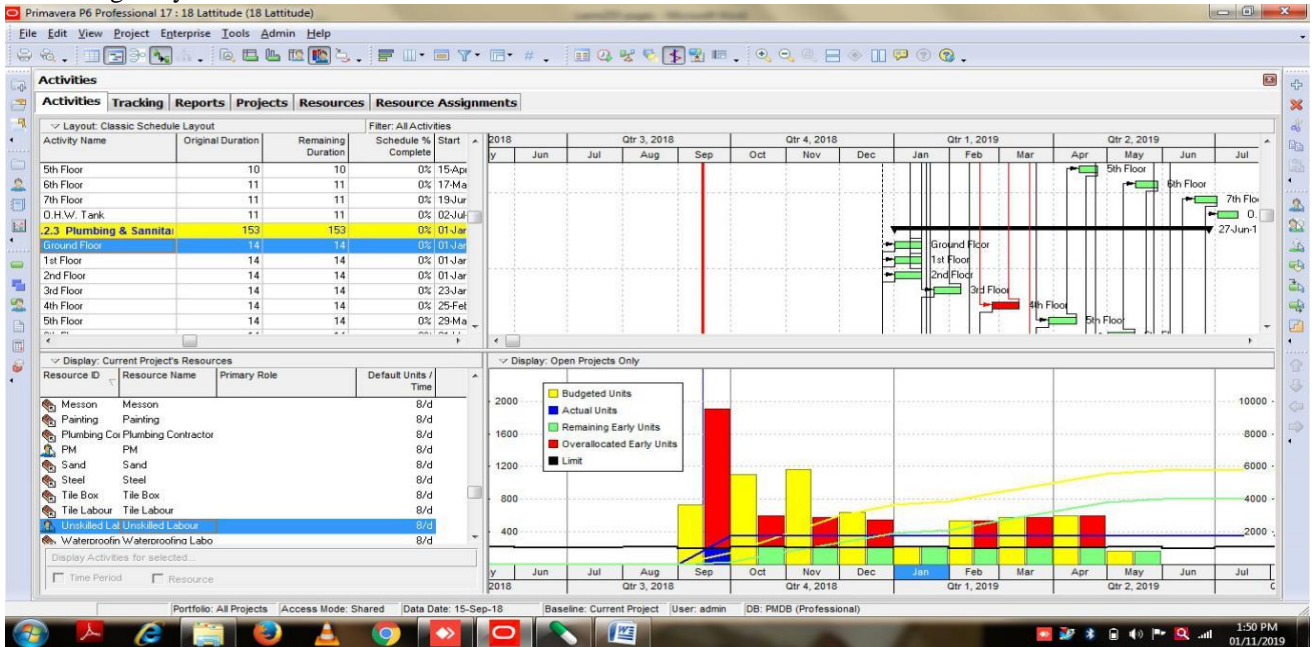


Fig 1.1 Remove Resource over Allocation Unskilled Labour

- Red line represent that the Unskilled Labour are over located early units. i.e. Resource over Allocation Unskilled Labour. As other graph, blue represent Actual units, yellow represent budgeted units And green represent reaming early units of Unskilled Labour. After Removing of Resource over Allocation, Unskilled Labour are in level that is over Allocation Unskilled Labour maximize at certain level.

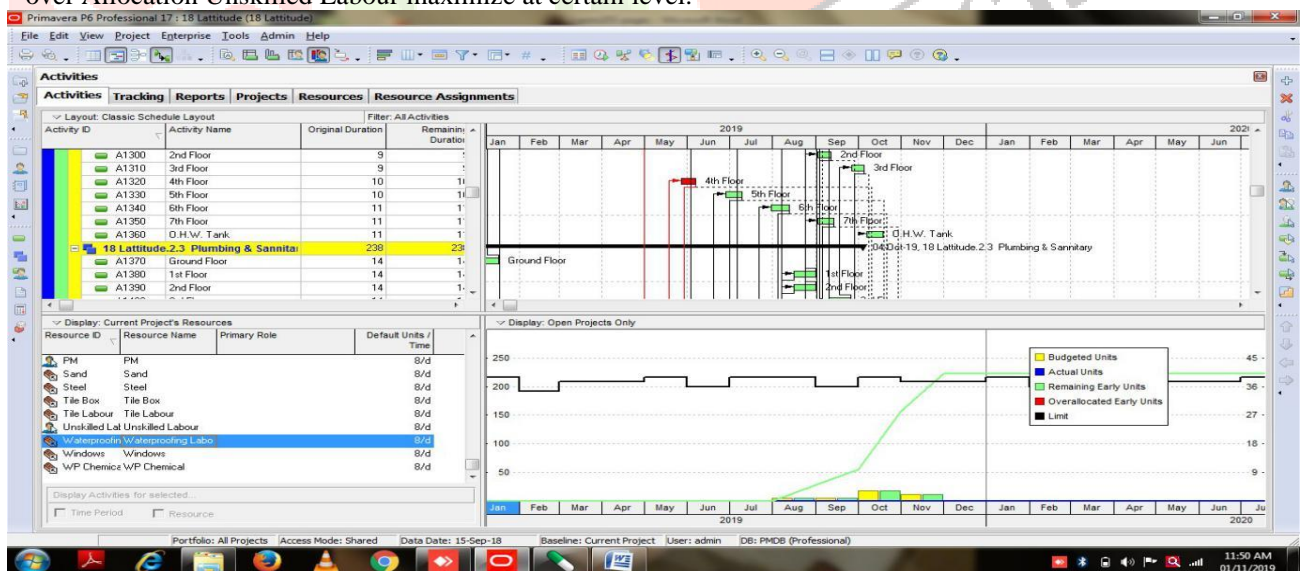


Fig 1.2 Resource over Allocation Water proofing labour.

- The Leveler device enables you to plan exercises in a manner that decreases or takes out over-burdens for assets allotted to more than one action inside a venture or crosswise over numerous activities. It can do this dependent on the need parameters you characterize at the action or undertaking level. This accommodates prioritization of exercises dependent on the undertaking they are in and furthermore their positioning inside a solitary venture. At the point when the leveler is utilized, it endeavors to move exercises to diminish or evacuate an over-burden for a specific asset. Utilized adequately the Leveler can be a useful asset for scope quantification, running consider the possibility that situations and helping you decide the effect of asset over-distributions.

18 Latitude		2 Week Lookahead				03-Oct-19 12:52 PM	
Activity ID	Activity Name	Start	Finish	Original Duration	Budgeted Total Cost	Predecessor	
18 Latitude							
MOBILISATION							
A1000	0%	01-Jan-19 08:00 AM	13-Mar-20 05:00	376d	Rs157,890,000		
A1030	0%	01-Jan-19 08:00 AM	05-Jan-19 05:00 PM	5d	Rs4,700		
A1010	0%	01-Jan-19 08:00 AM	02-Jan-19 05:00 PM	2d	Rs1,100		
A1010	0%	03-Jan-19 08:00 AM	05-Jan-19 05:00 PM	3d	Rs3,600	A1000	
SUBSTRUCTURE							
A1040	0%	19-Jan-19 08:00 AM	21-Jan-19 05:00 PM	2d	Rs3,600	A1030	
A1030	0%	15-Jan-19 08:00 AM	18-Jan-19 05:00 PM	4d	Rs26,929	A1020	
A1090	0%	07-Feb-19 08:00 AM	12-Feb-19 05:00 PM	5d	Rs159,017	A1080	
A1100	0%	13-Feb-19 08:00 AM	18-Feb-19 05:00 PM	5d	Rs279,170	A1090	
A1080	0%	31-Jan-19 08:00 AM	06-Feb-19 05:00 PM	6d	Rs112,785	A1070	
A1020	0%	07-Jan-19 08:00 AM	14-Jan-19 05:00 PM	7d	Rs50,400	A1010	
A1070	0%	22-Jan-19 08:00 AM	30-Jan-19 05:00 PM	8d	Rs89,411	A1040	
SUPERSTRUCTURE							
RCC Work							
A1110	0%	19-Feb-19 08:00 AM	06-Nov-19 05:00 P	224d	Rs5,741,895		
A1110	0%	19-Feb-19 08:00 AM	22-Mar-19 05:00 PM	28d	Rs594,125	A1100	
A1120	0%	23-Mar-19 08:00 AM	24-Apr-19 05:00 PM	29d	Rs599,325	A1110	
A1130	0%	25-Apr-19 08:00 AM	27-May-19 05:00 P	29d	Rs596,625	A1120	
A1140	0%	28-May-19 08:00 AM	28-Jun-19 05:00 PM	29d	Rs598,575	A1130	
A1150	0%	29-Jun-19 08:00 AM	31-Jul-19 05:00 PM	29d	Rs1,574,720	A1140	
A1160	0%	01-Aug-19 08:00 AM	02-Sep-19 05:00 P	29d	Rs596,175	A1150	
A1170	0%	03-Sep-19 08:00 AM	04-Oct-19 05:00 PM	29d	Rs597,975	A1160	
A1180	0%	05-Oct-19 08:00 AM	06-Nov-19 05:00 P	29d	Rs584,075	A1170	
Brick Work							
A1270	0%	23-Mar-19 08:00 AM	10-Dec-19 05:00 P	225d	Rs872,912		
A1190	0%	02-Dec-19 08:00 AM	10-Dec-19 05:00 P	8d	Rs38,990	A1260	
A1200	0%	23-Mar-19 08:00 AM	16-Apr-19 05:00 PM	21d	Rs122,364	A1110	
A1210	0%	25-Apr-19 08:00 AM	18-May-19 05:00 P	21d	Rs100,349	A1120	
A1210	0%	28-May-19 08:00 AM	20-Jun-19 05:00 PM	21d	Rs100,699	A1130	
A1220	0%	29-Jun-19 08:00 AM	23-Jul-19 05:00 PM	21d	Rs100,704	A1140	
A1230	0%	01-Aug-19 08:00 AM	24-Aug-19 05:00 P	21d	Rs101,239	A1150	
A1240	0%	03-Sep-19 08:00 AM	26-Sep-19 05:00 P	21d	Rs102,304	A1160	
A1250	0%	05-Oct-19 08:00 AM	29-Oct-19 05:00 PM	21d	Rs102,439	A1170	
A1260	0%	07-Nov-19 08:00 AM	29-Nov-19 05:00 P	21d	Rs103,824	A1180	
Plaster Work							
A1250	0%	03-May-19 08:00 AM	11-Jan-20 05:00 PM	218d	Rs1,747,505		
A1290	0%	03-May-19 08:00 AM	11-May-19 05:00 P	8d	Rs194,700	A1370	
A1300	0%	05-Jun-19 08:00 AM	14-Jun-19 05:00 PM	9d	Rs197,040	A1380	
A1310	0%	08-Jul-19 08:00 AM	17-Jul-19 05:00 PM	9d	Rs200,010	A1390	
A1320	0%	09-Aug-19 08:00 AM	19-Aug-19 05:00 P	9d	Rs202,110	A1400	
A1320	0%	11-Sep-19 08:00 AM	21-Sep-19 05:00 P	10d	Rs202,500	A1410	
A1330	0%	14-Oct-19 08:00 AM	24-Oct-19 05:00 PM	10d	Rs238,200	A1420	
A1340	0%	15-Nov-19 08:00 AM	27-Nov-19 05:00 P	11d	Rs237,750	A1430	
A1350	0%	18-Dec-19 08:00 AM	30-Dec-19 05:00 P	11d	Rs237,750	A1440	
A1360	0%	31-Dec-19 08:00 AM	11-Jan-20 05:00 PM	11d	Rs37,445	A1450	
Plumbing & Sanitary							
A1370	0%	17-Apr-19 08:00 AM	26-Dec-19 05:00 P	218d	Rs891,000		
A1370	0%	17-Apr-19 08:00 AM	02-May-19 05:00 P	14d	Rs108,000	A1190	
A1380	0%	20-May-19 08:00 AM	04-Jun-19 05:00 PM	14d	Rs108,000	A1200	
A1390	0%	21-Jun-19 08:00 AM	06-Jul-19 05:00 PM	14d	Rs108,000	A1210	

Fig 1.4 Complete Schedule

VII) CONCLUSION:

Resource levelling at project job site and forwarding demand package puts constraint on best viable/possible sharing of resources among projects. Disbursement of resources from combined or sole resource station per multi projects aggregated and leveled demand resulted in 5.65% resource reduction in our case study.

- Due the rise of construction of the country, the task of construction process as monumentally increased. So effective resource management reduce loss of time.
- It was observed that after planning and scheduling using Primavera platform the time duration and Construction cost was reduced. Hence after careful studying this software one can control the project in terms of duration hence leading to cost optimization.
- For efficient recourse management planning and controlling of a construction project it is very necessary to use project management software. This study represents the importance of resource management in a large construction project. Only because of efficient resource management by Primavera P6 Platform overall cost of a construction which sometimes increases due to wastage of recourse which should controlled delay in time also decrease. The case study proved to be a guideline in understanding the progress of a Commercial construction project. The companies which do not use primavera software tool efficiently have to increase their investments in training and educating their employed project teams.
- Resource deliverance to multisite projects from a single resource base station after leveling the combined demand is always economical. Absence of resources knowledge and their engagement details between different resource source bases will lead to resource underutilization.

FUTURE SCOPE:

In fact a state-of-the art resource management is essential for a construction project to succeed in fulfilling its project objectives. Allocation of resources for activities is necessary in construction domain to complete the project within the scheduled time. Resource levelling is needed in construction projects to avoid the difficulties associated with the large variations in resource usage. The resource optimization and resource levelling problem is one of the highly important issues in project accomplishment and has been ever taken into consideration by project manager. In next phase of this project it can be useful for Infrastructure projects.

VIII) ACKNOLEDGMENT:

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