

STUDY ON PROJECT PLANNING, SCHEDULING AND EXECUTION OF RESIDENTIAL APARTMENT USING MSP

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Abstract: Countries around the world provide major preference to the construction industry, as it contribute vastly to the growth of a nation, but use of traditional practices and improper planning reduces the efficiency of the construction industry which affects the project in the form of increased duration of the project, this leads to the increased overhead cost of the project and poor quality of work. In order to eliminate these flaws in construction project, an effective project management tool is introduced in the form of Microsoft Project software (MSP). In this study project scheduling, estimation and resource allocation are adopted in UNICON NORTH BROOKS 46 residential apartment construction project. Various works involved in the construction project are estimated and the activities are scheduled. Cost, time, and materials of the project are obtained by resource allocation. The tracking of current progress and performance analysis is done using Earned Value Analysis.

Keywords: Project Management, Resource allocation, Microsoft Project, Critical Path Method, Earned Value Analysis.

I. INTRODUCTION

Traditional way of planning does not sub divide the main task which in future leads to over allocation of resources, increased cost of construction, delay in delivery of project, all these flaws in construction practices calls for an effective project management.

Project management is the application of knowledge, skills and techniques to project activities to meet project requirements. Effective management of man power, machinery as well as materials by proper planning using project management tools such as Microsoft Project and technique such as CPM. Project gets started at the right way but as it proceeds further, gets off the track. Owing to this, it is important to manage activities in the right way, thus project management plays a vital role in arranging the critical activities of the project which is called as task to function in the appropriate way. In the large scale constructions projects there are two important prior factors to be considered i.e. time and money for the successful completion of any construction project is completion of the project within the estimated cost and time.

II. MSP IN PROJECT MANAGEMENT

MSP is the project management software program, it has been developed and sold by the Microsoft, MSP was developed in the year 1987, a small external company had developed the primary version of MSP in 1988, and later the company was acquired by Microsoft.

This brought the development project in house, in 1990 the finalized application hit the market as part of the companies applications offerings, for Microsoft windows, with the help of this application, the project users are able to manage their projects very easily. This project management software offers a better experience with its visual enhancements and updates and updates, for the project managers. It helps complete the projects on time and without any hassles, which affects the overall productivity of the team and organization. The project manager is able to plan, manage and deliver their projects without wasting much time. Microsoft project standard has been designed for home and small business requirements the plan and schedule after a project is approved and initiated.

III. PROJECT DETAILS

The project "UNICON NORTH BROOKS 46" consist of A, B, C and D Blocks spread over in a combination of 13 and 14 floor towers which consist of 264 residencies of 2, 2.5 and 3 BHK apartments ranging from 1045 sq. ft. to 1350 sq. ft. It is located Opposite to Veerasagara Lake, Atturu Layout, Yelahanka, Bengaluru. The study is carried out only for tower a in which planning and scheduling is done for entire 14 floors and further resource allocation, resource levelling, updating and tracking is done only for first floor.

IV. METHODOLOGY

- In project management, a schedule is a listing of a project's activities and deliverables, usually with intended start and finish dates. Actual scheduling process starts, various activities involved in the project are listed based on the expert judgment and a most suitable project calendar is selected. Mode of task is selected as auto schedule, number of days required to complete a task is entered, this automatically selects the start and the finish date of that particular task as the task mode is selected as auto schedule.

- Those items are often estimated by other information included in the project schedule of resource allocation, budget, task duration and linkages of dependencies and scheduled events.
- A schedule is commonly used in the project planning and project portfolio management parts of project management. Detail scheduling of project is done.

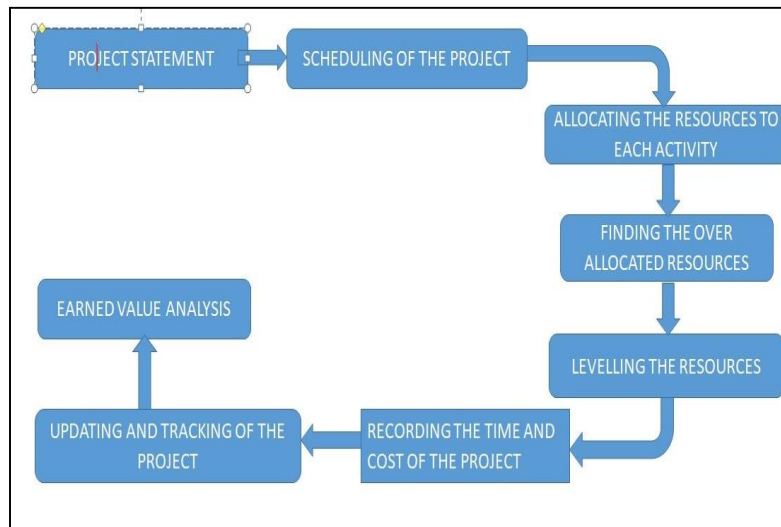


Figure 1.1 Project Methodology

- After scheduling of the project, the allocation of resources for activity is made. The resources which are required for the project is listed in the resource sheet and then the resources for each and every activity is allocated separately.
- After allocation of the resources if there is any shortage of resources there will be indication of over-allocation in the resource sheet.
- After finding the over allocated resources, levelling of the resources should be done. Levelling can be done using different methods.
- After levelling, record the change in time and cost of the project.
- Finally the updating and tracking of the project is done using Earned Value Analysis.

A. WORK BREAKDOWN STRUCTURE

WBS is defined as “deliverable-focused, hierarchical grouping of project and defines the total project scope”. Deliverables are tangible, measurable parts of a project which cannot be further broken. Task is not a WBS element but a set of tasks produce a deliverable.

	Task Mode	Task Name	Duration	Start	Finish
1		UNICON	789.2 days	Tue 2/16/16	Fri 9/28/18
2		EXCAVATION	10 days	Tue 2/16/16	Fri 2/26/16
5		FOUNDATION	39 days	Sat 2/27/16	Thu 4/14/16
21		BASEMENT	217.2 days	Tue 3/1/16	Sat 11/19/16
61		GROUND FLOOR	692 days	Mon 5/9/16	Sat 8/25/18
140		I FLOOR	679 days	Fri 6/10/16	Wed 9/12/18
235		II FLOOR	652 days	Wed 7/13/16	Fri 9/14/18
330		III FLOOR	632 days	Sat 8/6/16	Sat 9/15/18
425		IV FLOOR	632 days	Mon 8/8/16	Mon 9/17/18
520		V FLOOR	632 days	Tue 8/9/16	Tue 9/18/18
615		VI FLOOR	632 days	Wed 8/10/16	Wed 9/19/18
710		VII FLOOR	632 days	Thu 8/11/16	Thu 9/20/18
805		VIII FLOOR	632 days	Fri 8/12/16	Fri 9/21/18
900		IX FLOOR	632 days	Sat 8/13/16	Sat 9/22/18
995		X FLOOR	632 days	Tue 8/16/16	Mon 9/24/18
1090		XI FLOOR	505.5 days	Thu 1/19/17	Tue 9/25/18
1185		XII FLOOR	505.5 days	Fri 1/20/17	Wed 9/26/18
1280		XIII FLOOR	505.5 days	Sat 1/21/17	Thu 9/27/18
1375		XIV FLOOR	505.5 days	Mon 1/23/17	Fri 9/28/18
1470		MISCELLANEOUS	74 days	Tue 6/26/18	Sat 9/22/18

Figure 1.2 WBS of Tower A (G+14 Floors)

B. GANTT CHART

The Gantt chart is used for daily/weekly tracking of project progress. It is easy to use and maintain. It has become the most commonly used project schedule chart because of its simplicity and the focus it creates when tracking the project.

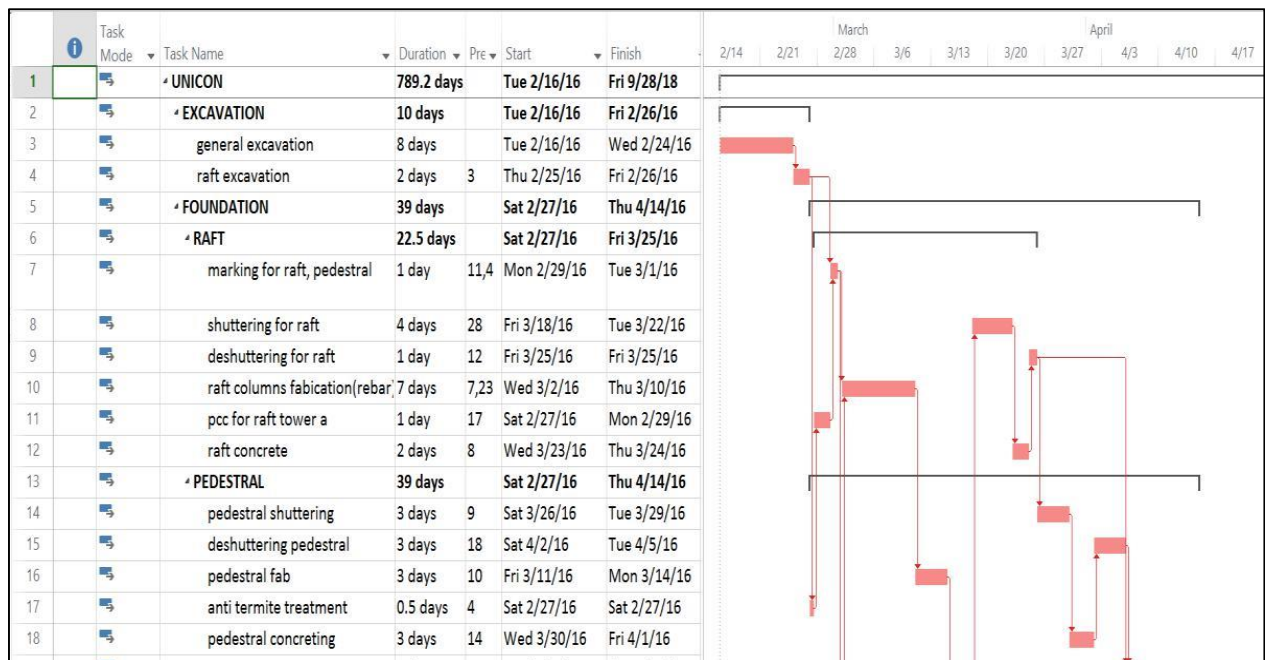


Figure 1.3 Gantt Chart and critical path

C. RESOURCE ALLOCATION

Project contour is the shape of the distribution of work within an assignment. Usually, if a resource is assigned 100% to a 40-hour task with no predecessors, the task will begin immediately with 8 hours of work/day for 5 days. This is the default flat work contour where each unit's work is spread evenly across the duration of the task. Sometimes, you may need to change the distribution of an assignment's work by applying a predefined contour for it.

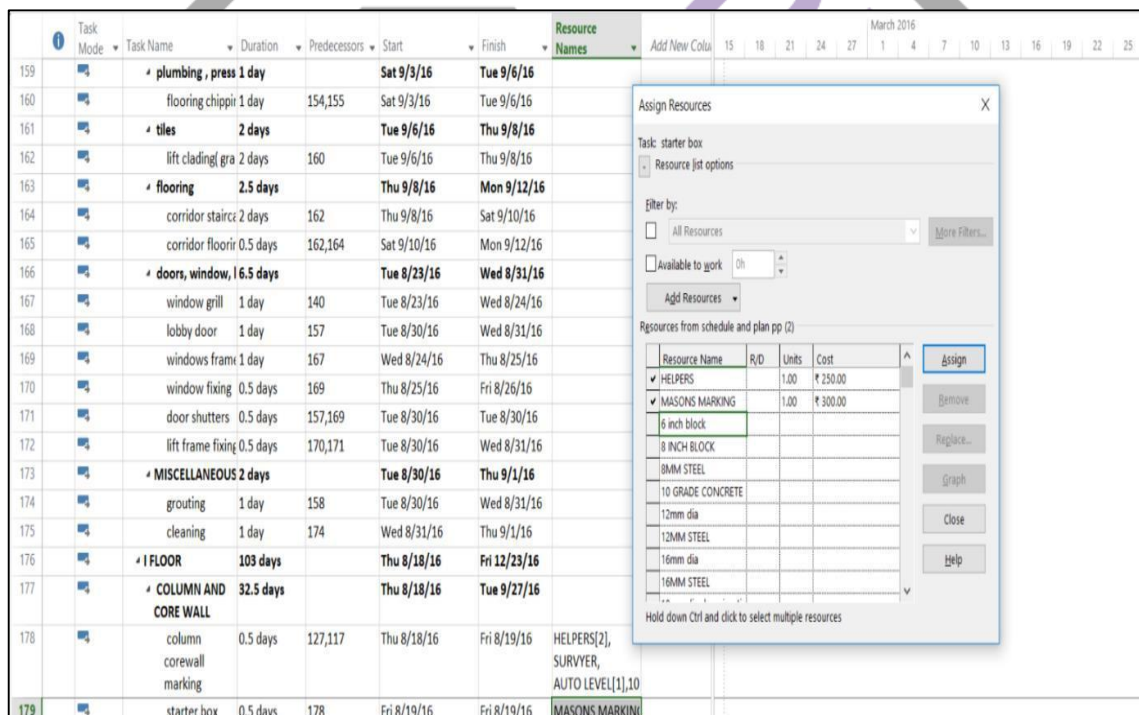


Figure 1.4 Assigning resources to the tasks

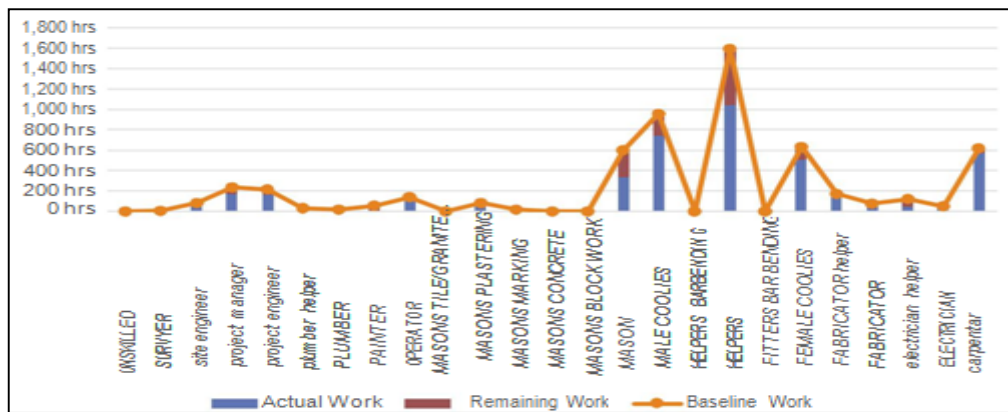


Figure 1.5 Resource overview generated in MSP

D. OVER RESOURCE ALLOCATION

When a resource is assigned to the tasks and it spends more time than its work calendar permits on a single task or a combination of tasks occurring at the same point in time. After the allocation of resources to various activities, we observe some of the resources being over allocated which is represented by red colour.

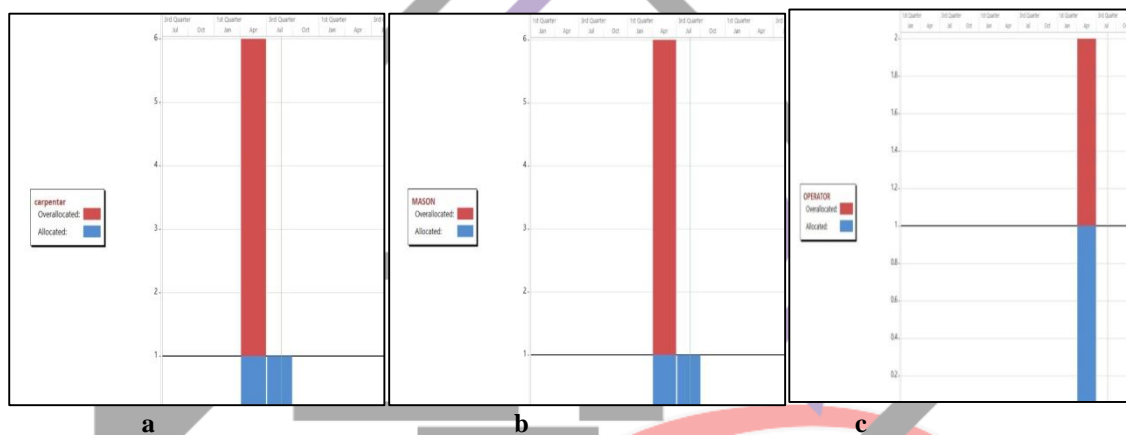


Figure 1.6 Over allocation of a) Carpenter b) Mason c) Operator

E. RESOURCE LEVELLING

Levelling is carried out in order to level the over allocated resources and hence to balance the activity operation to which these over allocated resources were assigned. We have adopted Automatic Levelling option in MSP 2013 i.e. the 'Level All' option by which all the over allocated resources got levelled without bringing change in the project time and cost as shown in the following figures. Hence the cost and duration remains the same after levelling. Levelling is done only with the available slack option as shown which will avoid change in the end date of the project. The red symbol indicates particular activity is over allocated and hence to be levelled.

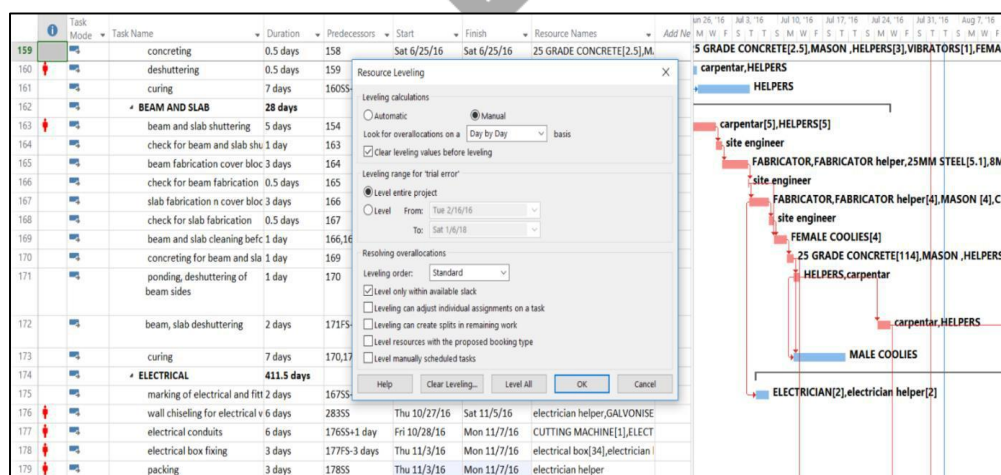


Figure 1.7 Automatic Levelling Option

F. EARNED VALUE ANALYSIS

This is the final step done in MSP 2013 which is carried out to evaluate the project performance as per the review date. Here analysis is done only for one review date. Earned Value Management (EVM) is a systematic approach to the integration and measurement of cost, schedule, and technical (scope) accomplishments on a project or task. It provides both the government and contractors the ability to examine detailed schedule information, critical program and technical milestones, and cost data.

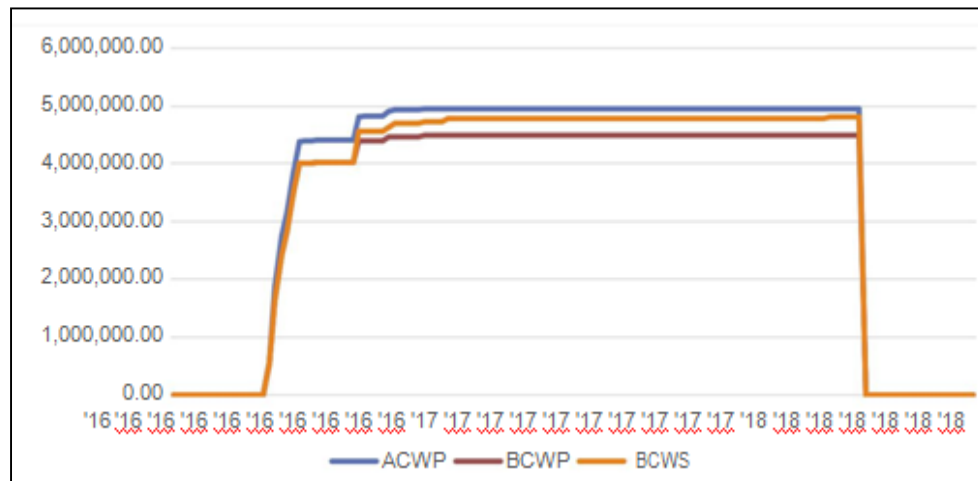


Figure 1.8 Earned Value Graph

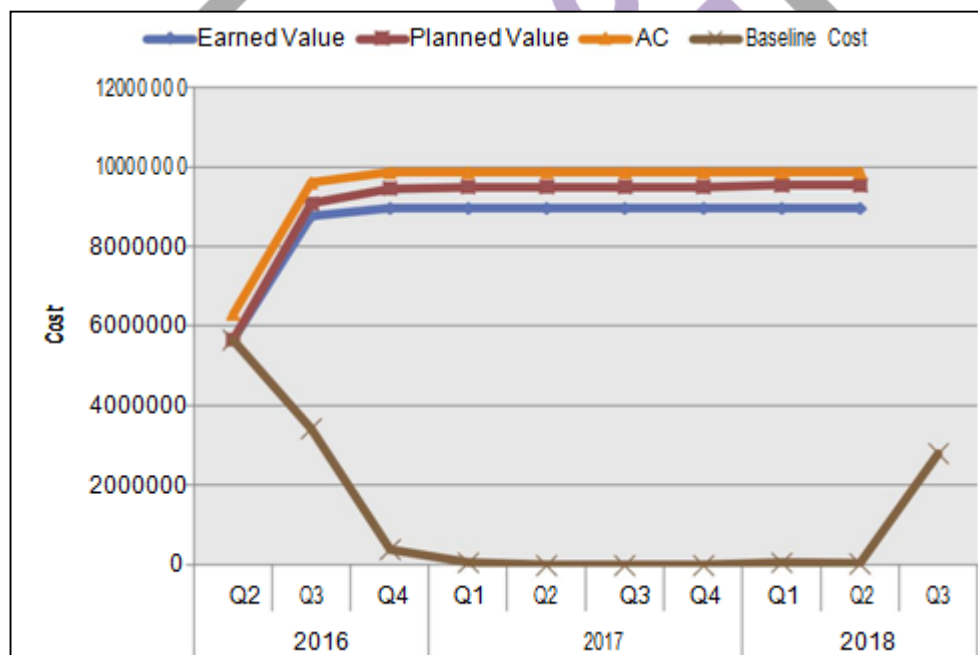


Figure 1.9 S-Curve (Earned Value Time report)

V. CONCLUSION

- In this Project Planning, Scheduling, Resource Allocating, Levelling and Tracking is done using a construction management tool Microsoft Project 2013 which is very much efficient than excel and is used by construction companies for their effective output.
- In this study the EVA is carried out using MSP however in the developing situations the material resource tracking analysis can also be done with respect to the schedules.
- Tracking at any sort of date allows managers to have control over delays in the work, the situation arising can be easily managed by the managers.
- Company having several number of similar projects can utilize this system of analysis and can update with the best possible alternatives as per the requirements.

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