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Planning, scheduling and tracking of service apartment building using MS project

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Abstract—Construction industry is an integral component of a nation's infrastructure and industrial growth. This industry is the second largest industry in India still its growth has been differential across the nation. The traditional project management system cannot meet the demands of today's projects, as tremendous amount of information and data on a project are always changing. The main objectives of this study are to planning, scheduling and tracking of commercial project with the help of MS Project software. Elements of project planning, including the creation and use of work breakdown structures. This paper additionally discusses the rate analysis of the structural works of the Service apartment project.

IdxTerms - Construction management, Time, Cost, Scheduling, Estimation Resource Allocation, Tracking.

I. INTRODUCTION

Construction industry is an integral component of a nation's infrastructure and industrial growth. This industry is the second largest industry in India still its growth has been differential across the nation. There is a vast difference of development in the rural and urban areas. Here arises the need for effective project management. Many problems and issues are being faced by the construction industry, major of them are cost overruns and time overruns due to inadequate project formulation, poor planning for implementation and improper management during execution. Many analysts state that average cost of project goes up by 30% as of the budgeted cost due to improper planning and scheduling. Observations show that proper skillful management is essential for a project to complete within time, estimated budget and with allocated resources. Planning in the broad sense includes planning of resources, materials, manpower, cost, duration etc. of any project well ahead of the start of the project so as to give a rough idea about the project in terms of cost and duration. Providing good planning, proper organization, sufficient flow of resources to project can automatically achieve the desired result.

Microsoft Project is the world's most popular project management software developed and sold by Microsoft. The application is designed to assist project managers in developing plans, assigning resources to tasks, tracking progress, managing budgets and analyzing workloads. Microsoft Project creates critical path schedules, although a critical chain third-party add-on is available from Pro Chain and Spherical Angle. Schedules can be resource leveled. The chain is visualized in a Gantt chart.

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and data on a project are always changing. The main objectives of this study are to plan and schedule commercial project with help of MS Project software. Elements of project planning, including the creation and use of work breakdown structures. This chapter additionally discusses the rate analysis of the structural works of the Service apartment project.

II. SCOPE OF THE STUDY

- ✓ Project management plays an important role in the construction industry.
- ✓ Develop a full understanding of the project goals, objectives and benefits before committing significant resources. This ensures the projects which are expected to provide benefits exceeding the investment of time and money are initiated.
- ✓ MS Project software will be used to develop a planning and scheduling model for the building construction project.
- ✓ Although the usage of this software between the constructions company is still lower, therefore with the production of these report finally will give the person some input about the importance of the MS Project planner software in the planning and scheduling for the construction project.
- ✓ The study just concentrate on the work sequences of the Service apartment building and the planning and scheduling technique that has been using for the project and also about the analysis of rates for the particular item of works.

III. PROCESS INVOLVED

Step 1: Studying Plans

It is the first step for the estimation process. From this we can able to understand project by base to top. It eliminates the unnecessary doubts and reduces the time delay due to that

Step 2: Estimation

Estimation determines the probable construction cost of a project. Estimating can be done at various stages of project duration depending on the purpose of estimation. First

estimation is done before construction starts for the purpose of making budget of the project or bidding the project as a contractor.

Step 3: Collection of required details

After completion of the estimation process it is necessary to collect the required details like Material cost, Labour cost, Man power, etc.

Step 4: Scheduling

Scheduling is the process of arranging, controlling and optimizing work and workloads in a production process or manufacturing process. Scheduling is used to allocate plant and machinery resources, plan human resources, plan production processes and purchase materials. scheduling can be done by values collected from the above processes

Step 5: Analyzing and Tracking

Finally analyze the values from the above process and compare the Planned value and scheduled value. If any deviations occurred, we can make the alteration either man power or working hours depending upon the site condition.

Step 6: Rescheduling

To finish proposed project within the given time it is necessary to reschedule the project. Rescheduling process is carried by constant time interval to avoid the time delay.

IV. OBJECTIVE OF THE STUDY

- ✓ To study the construction sequence for the building construction.
- ✓ To make the quantity for the respective project using various estimation techniques.
- ✓ To identify the scheduling technique used in developing planning and scheduling.
- ✓ To develop scheduling using MS Project planners software.
- ✓ To analysis the rates for the particular item of works.
- ✓ Rescheduling the above value if it is necessary.

V. LITERATURE REVIEW

Vishnu, Dr. Shreenivasreddy, Shahapur Maneeth P D, Brijbhushan S (2017)

The main objective of this project is to improve the traditional scheduling method by MS Project software. It reduces the causes of delay, effect of delay and method of minimizing delay in construction project. Data has analysis to establish the relative importance of various factor that provides a particular quality or character to cause the effect in construction delay.

Mali P. A, Lokhande A.Y, Kadam S.K, Shirole S.B, More P.N, Velhal A.J (2017)

It is essential for a construction industry to improve the production rate of equipment. In order to achieve this, the overall Equipment Effectiveness was improved with low machine breakdown, less idling and minor stops time, reduced accident in plants, increased the productivity rate, optimized process parameter, improved profits though cost saving method. Proper planning, selection, procurement, installation, operation, maintenance and equipment replacement policy plays important role in equipment management for successful completion of project.

Harshlata Rewaskar, D.K.Shukla (2013)

The purpose of this paper is to determine if implementing project management software, especially Microsoft Project, would increase effectiveness of organization's project management and reduce project duration. It focuses on famous quote "Good project management cannot guarantee success, but poor management on significant projects always leads to failure."

Shubham Laddha, Prerna Chanda and Sneha Khedekar (2017)

Weak project management practices continue to be a common place in construction industry, particularly in developing countries. Poorly managed projects cost all stakeholders a huge amount not just financially but also psychologically and emotionally. It has motivated us to carry out the working and functioning of a project using the modern project management tool available in the market; and then comparing it with the traditional software (Excel) which is being use.

Rhuta Joshi, Prof. V. Z. Patil (2015)

The paper presents a resource constrained project schedule as per the site conditions. For resource constrained analysis resource leveling is done. The resource type for this project is considered manpower (labor) only. The project schedule increases day by day cost due to sudden requirement of labor or any unavoidable circumstances thus, it has an impact on the overall cost of the project. Duration is increased for decrease in resource constraints. The main objective of this study was to understand the role of monitoring and control in the progress and timely completion of a construction project

P M Wale, N D. Jain, N R Godhani, S R Beniwal, A A Mir (2015)

In this study Traditional way proves to be uneconomical and consumes more time with many complexity and enormous error which actual execution of the Project. Traditional way of planning doesn't sub divide the main task which future gets the hurdle of over allocation of resources, improper judgment of resources for particular activities etc. Microsoft Project is the modern tool of Project Management that aid to overcome the obstacles faced owing to traditional way of Planning and Management. It helps for the optimum and effective organization of activities which helps to give the vision to complete the project in planned duration and within the Economy. .

S. Ashok Manikandan T. Hemanandini & T. Karpagapriya (2017)

The time of the activity includes the weekly leave i.e. Sunday. Other unexpected leaves are not included in the manual scheduling. Here the scheduling is done by considering the unexpected holidays and the duration have been lowered by providing overtime and the project have been completed within the expected duration it is concluded that "Computer Aided Scheduling" is most efficient and time saving one and also makes the project, cost effective with Proper Planning.

Monish Kumar K, Maheshwar S Maregoudru, Sparsha B.P (2017)

In this study project scheduling, estimation and resource allocation are adapted in MK apartment residential construction project using MSP 2013 software. From this study we can

understand the various management like labor, time, cost could be accurately managed

Mr. Pradeep Dr. Rajendra S (2015)

This study says each and every cannot be done without any delay. Delay would be occurred due to many reasons ie. Labor availability and their coordination, materials, transportation, project location, etc. Those difficulties can be corrected using MS Project software. Resource leveling in Microsoft Project resources can be managed without effecting the total cost and duration of the project.

Abdul khahr MD Mukaram M,M., N.Ramya Smruthi, MD Toufeeq mohsin (2016)

This study proves the importants of project management by using two different methods. In the first method, three villas are constructed one after the other. In the second method, three villas are constructed simultaneously with effective usage of time and resources. From these two methods, the variations between the time and optimum usage of resources are observed and all necessary data of information are collected. This will help to use the resources effectively to similar kind of villas in the same place. Therefore the proper management can improve the productivity and cost efficiency of the project and help to ensure its timely completion with minimum cost.

VI. SITE DETAILS

- ✓ Building type : Service Apartment Building
- ✓ Location :Ramanujan IT City, Chennai
- ✓ Building area : 2.5 Lakh Sqft
- ✓ Floors : G+15
- ✓ Cost : 50 Crores
- ✓ Company Profile : URC Construction

VII. SEQUENCE OF WORK

A. Estimation

Various information required for the estimation process was directly collected from the construction project site. After that the process was completed by using various calculation methods. IS 1200 used for the quantity measurements and IS 7272 used for the man power allocation. Estimation determines the probable construction cost of a project. Estimating can be done at various stages of project duration depending on the purpose of estimation. First estimation is done before construction starts for the purpose of making budget of the project or bidding the project as a contractor.

B. Scheduling

The data required for the scheduling was collected from the Estimation process. The scheduling activity was done by using MS Project software. The activities are represented by graphical representation called Gantt chart, which clearly indicates the relation between the activities in a easily understandable manner. Over allocated resources are leveled by reducing the work hours, or by increasing the labor as per the required quantity.

C. WBS

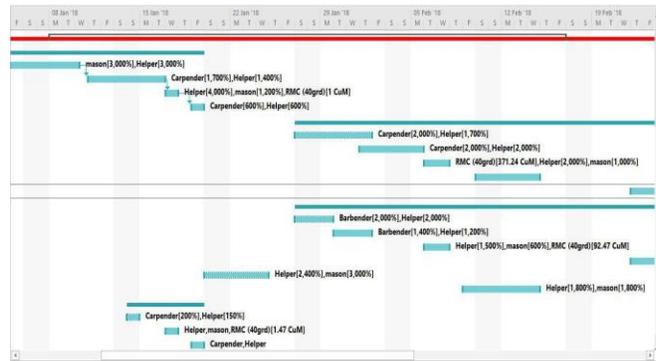
The various group of tasks or activities of project is connected together by adopting a hierarchical method known as work breakdown structure (WBS). The entire project can be impressively planned by dividing or separating the project into sub activities or tasks.

AA	Second Floor	30 days	Mon 08-01-18	Fri 16-02-18	
AA/.1	Column				
AA/.1.1	Steel	5 days	Fri 05-01-18	Wed 10-01-18	
AA/.1.2	Shuttering	4 days	Thu 11-01-18	Tue 16-01-18	3
AA/.1.3	Concrete	1 day	Wed 17-01-18	Wed 17-01-18	4
AA/.1.4	Deshuttering	1 day	Fri 19-01-18	Fri 19-01-18	5
AA/.2	Slab				
AA/.2.1	Shuttering	5 days	Sat 27-01-18	Thu 01-02-18	
AA/.2.2	Steel	3 days	Thu 01-02-18	Mon 05-02-18	
AA/.2.3	Concrete	2 days	Tue 06-02-18	Wed 07-02-18	
AA/.2.4	Post tensioning	4 days	Sat 10-02-18	Wed 14-02-18	
AA/.2.5	Deshuttering	3 days	Thu 22-02-18	Mon 26-02-18	
AA/.3	Beam				
AA/.3.1	Steel	2 days	Sat 27-01-18	Mon 29-01-18	
AA/.3.2	Shuttering	3 days	Tue 30-01-18	Thu 01-02-18	
AA/.3.3	Concrete	2 days	Tue 06-02-18	Wed 07-02-18	
AA/.3.4	Deshuttering	3 days	Thu 22-02-18	Mon 26-02-18	
AA/.4	Block Work	4 days	Sat 20-01-18	Wed 24-01-18	
AA/.5	Plastering	4 days	Fri 09-02-18	Wed 14-02-18	
AA/.6	Parti wall				
AA/.6.1	shuttering	1 day	Sun 14-01-18	Sun 14-01-18	
AA/.6.2	Concrete	1 day	Wed 17-01-18	Wed 17-01-18	
AA/.6.3	Deshuttering	1 day	Fri 19-01-18	Fri 19-01-18	

Work Breakdown Structure in MSP2013

D. Gantt Chart

After the scheduling process was done in the MS Project software the sequence of works appear as a Chart format known as Gantt Chart.his chart lists the tasks to be performed on the vertical axis, and time intervals on the horizontal axis. The width of the horizontal bars in the graph show the duration of each activity. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project.



Gantt Chart

E. Analyzing

Analyze the values from the above process and compare the Planned value and scheduled value. If any deviations occurred, we can make the alteration either man power or working hours depending upon the site condition.

VIII. CONCLUSION

- ✓ Project planning and Resource management is done by accurately using MS Project software also used to organize the resources required for the project effectively
- ✓ Compared to the traditional method MS Project is more effective and efficient.
- ✓ It gives clear picture of start and finish; the way activities are being performed, duration needed for every activity to get completed.

- ✓ Budget cost of the project is easily obtained as all the resources required for the project are planned and allocated priorly in MS Project.
- ✓ Resources can be managed by contractor with help of resource graph.

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