Planning, Scheduling and Allocation of Resources for Multi – storiedStructure using Microsoft Project Software

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Abstract - *The focus of this work is to study scheduling methods and construction systems for multistorey buildings, with the aim of applying Microsoft Project software to plan and schedule a hypothetical RCC residential G+7 building construction project. The study compares the traditional approach used by architects, engineers, and contractors with the modern software technique. Observations from the study indicate that Microsoft Project software is an effective tool for generating Gantt charts for construction project schedules. The software also offers the ability to determine the minimum duration of construction time through schedule crunching and project crashing methods. Overall, the study provides valuable information on the application of Microsoft Project software for planning and scheduling building construction projects. The use of this software can help to streamline the scheduling process, increase efficiency, and reduce costs associated with construction projects. It is important to note that while technology can be helpful in project planning and management, it is not a replacement for experienced professionals in the field who can provide insights and make informed decisions.*

***Key Words*: Project, Time, Cost, Scheduling, Resource Allocation, construction, Critical Path Method (CPM)**

1. INTRODUCTION

The construction industry faces various challenges related to time management, cost control, and project delays. These challenges can be minimized through proper project planning, which involves detailing the strategy that should be followed to complete the project within the defined time, budget, and quality specifications. Effective project planning facilitates communication among stakeholders, documents planning assumptions and decisions, and develops approved scope, cost, and schedule baselines.

Construction project management is the science and art of managing all aspects of the project to achieve project mission objectives, specific time, budget cost, and predefined quality specifications. It involves working efficiently and effectively in a changing project environment while ensuring the safety and health of construction workers. The mission of creating a construction facility or services is achieved through predetermined performance objectives defined in terms of quality specifications, completion time, budget cost, and other specified constraints.

The presented work reviewed the concepts of activity sequencing used in building construction, scheduling techniques used in Microsoft Project Planner, and the development of construction planning and scheduling. The study provides information about the project from the start to the end of construction, including what needs to be done before starting the project, during the construction, and after the completion of the project.

1.1 Microsoft Project:

Microsoft Project is a comprehensive project management software solution that aids project managers in planning and executing their projects. It provides the tools to create a detailed project plan, including tasks, milestones, and deliverables. Once the plan is created, resources can be assigned to each task, and the progress of each task and the overall project can be tracked. In addition, Microsoft Project enables project managers to manage the project budget and workload, ensuring that the project is on track and within budget. The four primary functions of Microsoft Project are developing a project plan, assigning resources to tasks, tracking progress, and managing the project budget and workload.

2. LITERATURE REVIEV

1] Shruti Singh, Shweta Is tape, Amruta Survey, Sahil Pandey, Avinash Singh, Sangram More MGMCET, Kamothe, University of Mumbai, Navi Mumbai, India Project Management is the application of knowledge, tools, techniques and skills to any project activities to meet the requirements of the project. Usually, many construction industries in India do not practice the use of project management properly. Poorly managed projects usually result in a huge amount to all stakeholders not just financially but also psychologically and emotionally as well as it also consumes a lot of time. This has greatly motivated us to carry out the working and functioning of a project using modern project management tool, one of which is MSP (Microsoft Project). This paper consists of planning and scheduling of various activities involved in a construction project using MSP. The presented work clearly gives the difference between carrying out the work using MSP and traditional planning techniques.

2] Subraman i, T.M.Karthic k Managing Director, Priyanka Associates (Civil Engineers and Valuers), Salem,

TamilNadu,India. Design Engineer, Indo Builders (Civil Engineers and Valuers), Dharmapuri ,TamilNadu, India he construction project under study aims to achieve a time-certain program performance goal through excessive stake endeavor. Without carefully planned and procured resources, it is impossible to complete activities within a predetermined timetable. Project managers face complex decisions under exceptional scheduling demands and uncertain conditions that sometimes extend beyond project intervals. This project study focuses on resource scheduling for a quick-track project with constrained intervals.

3] Nikhil R. Mahajan and M. V. Bhogone (2017) The methodology adapted by them was to compare Microsoft Project and Traditional Method. Schedule was prepared for both conventional and prefabrication method. A residential building was taken for comparison. The software used was MSP, the duration required for completion of project was collected from respective company. The comparison was made by comparing the total time required for completion by using critical path method with MSP project. The result shows that the total duration for both the conventional and prefabrication method and prefab construction for individual house and double story the required cost is 13% more than conventional but it reduces the project duration by 63 days.

4] R. Prabhahar and G. Ravichandran (2014) analyzed that; Construction planning is an important part of the overall management process. The planning and management includes organizing the work, executing the work, correlating plan and progress information and controlling the work, the three inter-related factors of time, money and quality need to be managed in a proper way. Completion of many of the projects nowadays is not in estimated duration. This will direct to an increase in overheads as well as various other factors. It will not only reduce the expected revenues but also will affect the reputation of the contractor. Scheduling is one of the vital functions in construction project to determine the sequence of activities necessary to complete a project.
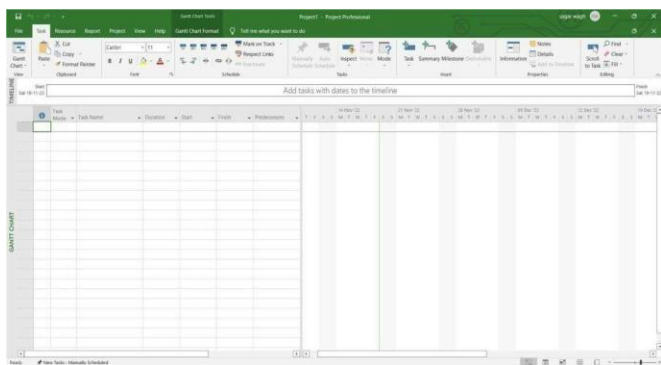
3. Model Applications

3.1 MS Project Interface

Fig 3.1. Microsoft Project 2021 shows blank project.

We can see here interface of MS Project and what kind of options are available on MS Project. Here we can enter our data and can do many activities such as creating Gantt Chart, Resource Allocation, Scheduling, Estimation, Creating Reports and many more.-
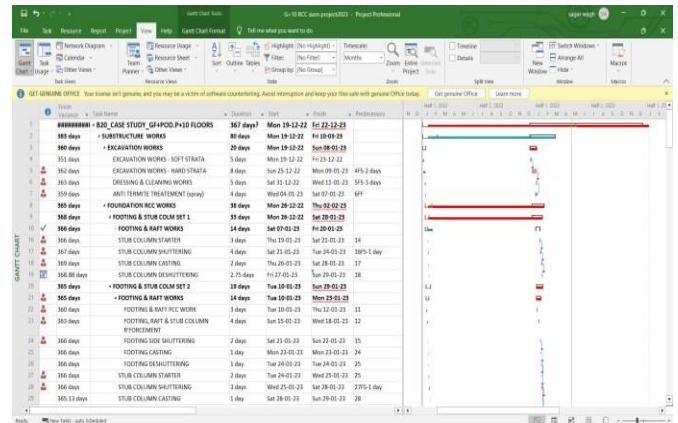
3.2 Scheduling Activities using network models

Fig 3.2. Scheduling of Activities

With the help of Microsoft Project, it's easily to understand and visualize the flow and network of the project. Users can also visualize parallel activities, which are activities that can be performed simultaneously, as well as slack or total float, which is the amount of time an activity can be delayed without affecting the overall project completion date.

Microsoft Project allows users to create network diagrams that show the relationships between activities and help to identify dependencies and potential bottlenecks in the project schedule. By visualizing these relationships and dependencies, project managers can make informed decisions about scheduling and resource allocation, and can take appropriate action to ensure that the project stays on track.

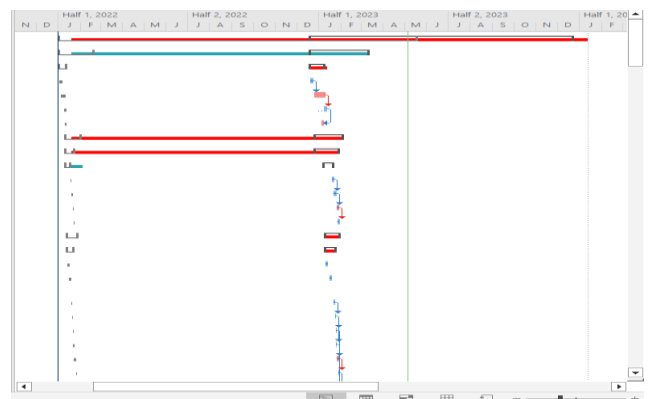## 3.3 Scheduling and Tracking Activities with Gantt Charts

Fig 3.3. Gantt Chart

Gantt charts are a key visualization tool used in project management, and they are extensively used in Microsoft Project (MSP). The left side of the Gantt chart in MSP typically displays a sheet view, which shows information about the tasks and their associated properties, such as start and finish dates, durations, and dependencies. On the right side of the Gantt chart, there is a bar graph that shows the tasks along a timescale.

4. RESULTS AND DISCUSSION

Using this software we got result about G+10 building and this result is very satisfactory such result are as follows.

4.1 Resource Overview

Fig 4.1. Resource Overview

Microsoft Project, resources are defined as people, equipment, or materials required to complete a project task. The Resource Overview provides an essential summary of the resources assigned to a project, their availability, and their workloads. It is a valuable tool for identifying resource conflicts, balancing workloads, and ensuring the effective use of resources in a project. Microsoft Project's Resource Sheet view displays a table of resources, including their names, types, and costs. This view can be customized by adding or removing columns based on the project's requirements. Additionally, the Resource Usage view provides a calendar-based view of resource allocation over time.
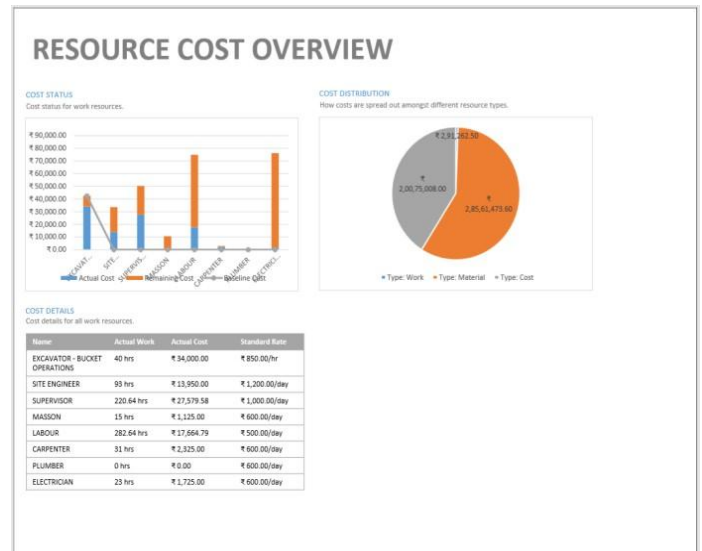
4.2 Resource Cost Overview

Fig 4.2. Resource Cost Overview

In Microsoft Project's Resource Cost Overview summarizes the costs associated with each resource in a project, including hourly rates, total costs, and any assignments or completed work.

This feature is an effective tool for monitoring and managing resource costs. It enables project managers to optimize resource allocation, identify cost overruns, and ensure the effective and efficient use of resources. Besides the Resource Cost Overview, Microsoft Project offers a variety of resource cost reports that help project managers analyze and manage the costs associated with their project's resources. Some of these reports include the Resource Cost Summary, Resource Cost by Type, and Resource Cost by Assignment reports.
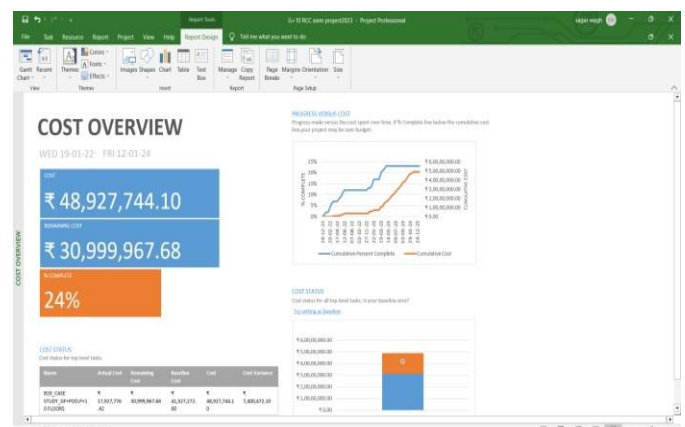
4.3 Cost Overview

Fig 4.3. Cost Overview

The Cost Overview feature in Microsoft Project provides a concise summary of the costs associated with each task and resource in your project, which includes the total cost, actual cost, remaining cost, and cost variance. It is an invaluable tool for project managers to monitor and manage the costs associated with their project's tasks and resources. By using the Cost Overview, project managers can efficiently optimize resource allocation, identify cost overruns, and ensure effective use of resources.
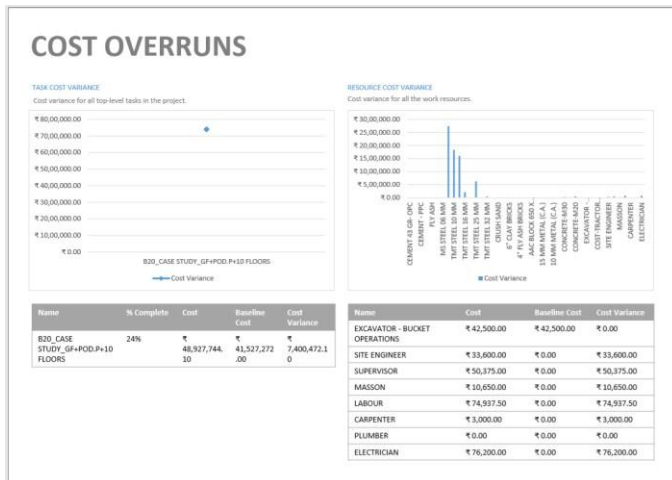
4.4 Cost Overruns

Fig 4.4. Cost Overruns

A cost overrun happens when the actual cost of a project surpasses its planned or budgeted cost. Cost overruns can significantly affect a project's timeline, quality, and success. In Microsoft Project, the Cost Overview and other cost-related reports are valuable tools for project managers to identify cost overruns and take appropriate steps to address them.
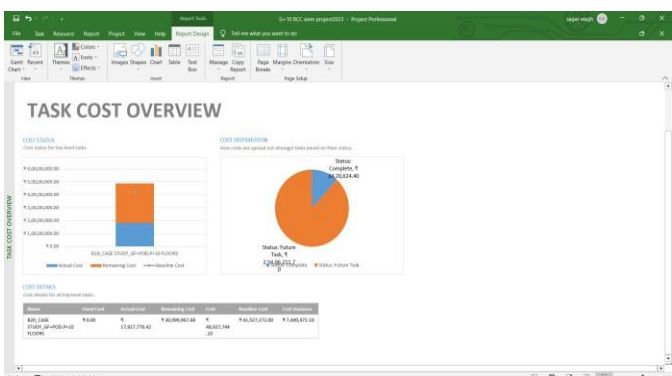
4.5 Task cost overview

Fig 4.5. Task Cost Overview

The Task Cost Overview feature in Microsoft Project provides a comprehensive summary of the costs associated with each task in your project. It includes the total cost,

actual cost, remaining cost, and cost variance. This tool is useful in tracking and managing task costs and ensuring that the project remains within budget and on track. Monitoring actual costs, analyzing variances, and adjusting the project plan as needed are crucial steps in achieving this goal.
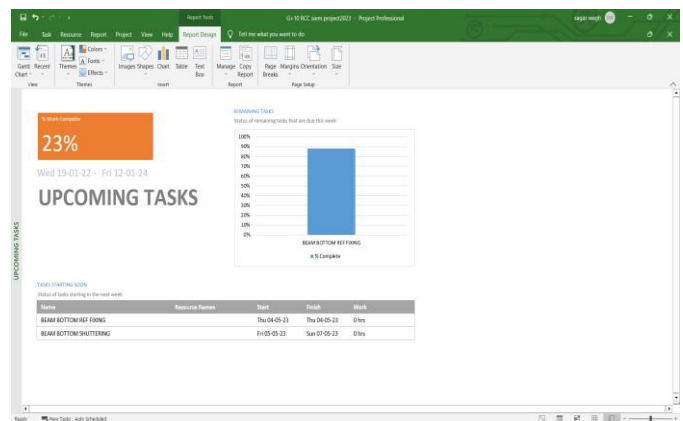
4.6 Upcoming Tasks

Fig 4.6. Upcoming Tasks

Microsoft Project offers two views to visualize upcoming tasks: the Timeline view and the Gantt Chart view. Once you have identified the upcoming tasks in your project, you can take essential steps to prepare for them. This may include allocating resources, reviewing task dependencies, and adjusting the project schedule as necessary
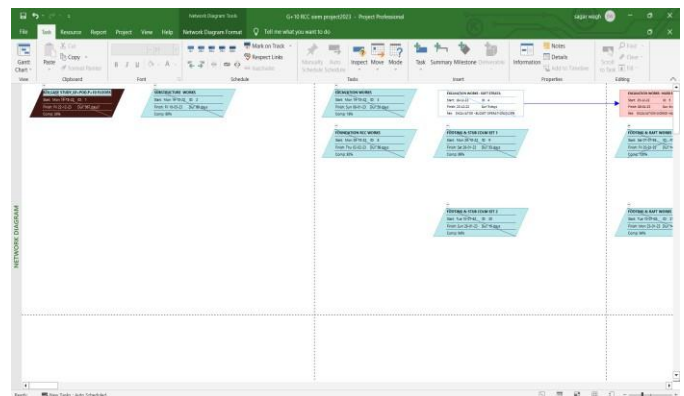
4.7 Network Diagram

Fig 4.7. Network Diagram

Microsoft Project offers the Network Diagram view feature, which allows you to create a visual representation of the project's tasks and their dependencies. This diagram can help you identify the critical path of your project and any scheduling conflicts. Utilizing the Network Diagram view in Microsoft Project can provide you with a better understanding of the interconnections between project

tasks and help you to identify any potential scheduling issues, which in turn can enable you to make necessary adjustments to your project plan and ensure that your project remains on track.

5. CONCLUSIONS

Microsoft Project helps for scheduling, planning. Using this software we plan G+10 building, their schedule and their allocating. Using this software we plan easily, it reduce less time for planning, scheduling and allocation. We used this software for reducing time and proper management of labor, and all resources in time. We experienced that this software is very useful for now days in construction field.

6. REFERENCES

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