

SCHEDULING OF A MULTI-STOREY BUILDING USING MICROSOFT PROJECT

Dr. S. Robert Ravi^{#1}, Dr. A N Swaminathen^{#2}, Mr. Sunil Biradar^{#3}, Mr. Ajit Kumar Dey^{#4}

¹Professor & Head, Civil department, ACE Engineering College, Hyderabad.

²Associate Professor, Civil Department, Sree Dattha Institute of Engineering and Science,

³Assistant Professor, Civil Department, Sree Dattha Institute of Engineering and Science

⁴Assistant Professor, Civil Department, Sree Dattha Institute of Engineering and Science

Abstract- Many companies and construction organizations experience issues with time delays and cost overruns when a project is not planned or scheduled. These issues typically occur when a project is not appropriately scheduled or executed. Project scheduling entails and explains to clients the sequence of actions that must be emulated for the successful completion of the project. The current paper discussed the principles of activity sequences utilized in construction of buildings, approaches for scheduling employed in the Microsoft project tool, and the progress of planning and scheduling in construction. From the beginning to the end, this project study provides information about the project. We will be able to know how to effectively schedule the activities in a building construction after the study is completed. The current research focused at a multi-story residential building that was constructed utilizing traditional procedures. The G+5 residential building at Vani Nagar, Malkajgiri In Telangana India was chosen for this case. The bar chart of the constructed structure, which contains scheduled activities and time taken for project completion, site data, plans and drawings, and so on, was used to achieve the project's goals. RCC G+5 Residential Building is the type of structure analysed. The company's data was evaluated and broken down into activities and sub-activities. Work Breakdown Structure was used to assess the activities, and Microsoft Project was used to schedule them properly. Since Microsoft Project is not integrated with Timeline template, So the data has to be entered manually to create a MSP Timeline. Since it's the most basic feature and the template is not necessarily required to get started. This work involves using MSP to schedule numerous activities included in the construction project. The work conducted here clearly illustrates the distinction between using MSP to plan a project and using traditional planning methodologies. The work depicted here was completed on a residential multi-story building based in Hyderabad, and it evidently displays how the MSP software can pace up the building construction while keeping costs down too.

Keywords: crumb rubber, utilization, compressive strength, low cost, sustainable

I. INTRODUCTION

Project management is the implementation of information, skills, and methods to conduct the activities of a project in order to achieve the project's demand. It is an organization's capability to perform the activities successfully (connected to a strategy to achieve a goal), making them to match results of the project to organizational goals and therefore better compete in their marketplaces. It is also the process and action of planning, organizing, and regulating needful things/valued supplies processes and standards of conduct in order to (achieve or gain with effort) certain objectives in scientific or everyday situations.

A project is a (usually short-term) goal modelled to make a unique product, service, or result with a described beginnings and end (usually limited to time) and usually by withholding payment/giving payments (to) or stuff which can be used to achieve strange goals and goals, generally to help fully change or added values. Projects' only short-term nature contrasts with business as usual (or operations), which are repeatable, permanent, or semi-permanent functional activities that develop products or services. The management involved for these two systems is generally quite clear/ separate when put into use, and as such requires/ demands the development (different branching out techniques into different abilities to do appropriate job related work) and management

(success plan / ways of attaining objectives). It has constantly been practiced (showing little corner in relaxed way), but it has began to change (and get better) as a high quality job /line.

The project starts off to a good start, but as it progresses/moves forward, it slips off track.

As a result, it's necessary to manage activities properly; as a result, the project management performs a critical role in organizing the project's critical activities, also known as jobs, so that they can function properly. Project management helps the project deliver services more efficiently (by wasting as little time as possible when working or generating anything).

Development the executive gives the efficient use of the assets accessible in the most un-conceivable time term for effective fruition of development project. Human resources, materials, machinery and money are named as important assets in developing Management.

Arranging, booking is a significant piece of the development the executives. The most common way of preparation and planning of the development exercises assist engineers with finishing the venture on schedule and inside the spending plan.

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The term development doesn't just mean proactive tasks incorporating humans, materials & apparatus, it additionally encompasses the whole degree of activities from origination to acknowledgment of a development project. Subsequently the administration of assets to such an extent that men, materials, apparatus requires compelling arranging and booking of every movement.

A. Scheduling

Scheduling in construction project management is the detailing of activities, outputs, and milestones within a project. A schedule also includes a outlined starts and finish dates, period, and necessary resources allotted to each exercise. Adequate scheduling in projects is a demanding factor for the successful time management.

- **Scheduling In Project Management**

Schedules are divided into three categories:

Schedule for the overall project: A master schedule is typically a condensed set of tasks accompanied by a timeframe or a calendar.

Schedule of milestones or summary schedule: This form of plan keeps track of major milestones and deliverables, but not all of the tasks that must be completed to finish the project.

B. Construction Scheduling Methods

1. Critical Path Method (CPM):

Critical path method is a resource-utilization technique involving algorithm for scheduling a series of project activities. The fundamental technique for using CPM is to produce a model of the project that includes the following:

- A list of all tasks required to complete the project.
- The dependencies between the tasks.
- The estimate of time (duration) that individual activities will take to complete.

With this knowledge, we can demonstrate the critical path by identifying the longest set of dependent activities and measuring them from the start to finish Once we have managed to identify which activities are the longest, or falls under critical path, we can more easily distinguish which activities have the total floats, or can be delayed without affecting the entire duration for the project.

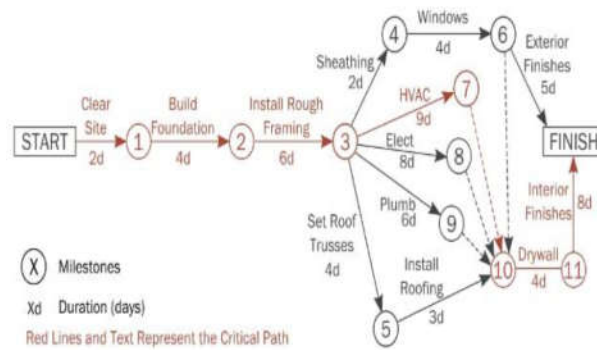


Fig. 1: Critical Path Method

2. Program Evaluation and Review Technique (PERT):

PERT is one of the most visually accessible construction scheduling tools. Essentially, it is a diagram that “provides a visual depiction of the major project activities and the sequence in which they must be completed.” Each of these steps represents the use of time or resources or both. Think of it as a road map toward project completion; only once you pass all of the milestones will the building have reached its final stages

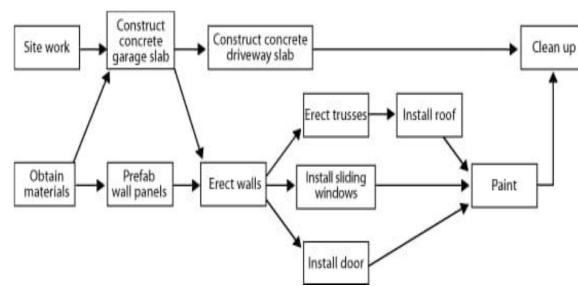


Fig. 2: PERT Chart

3. Line of Balance (LOB):

Line of balance (LOB) is a management control process ... where the project contains blocks of repetitive work activities, such as roads, pipelines, tunnels, railways, and high-rise buildings. LOB collects, measures, and presents information relating to time, cost and completion, and presents it against a specific plan.

LOB helps to pinpoint where projects go off-track but identifying the specific moments at which deviations occur, and the resulting knock-on or secondary effects that accrue from them. It was developed by the Goodyear Company and has since been used by the Navy, and reflects project goals as a single line on a graph in the form of activities completed/time, to which teams are supposed to adhere to stay on track.

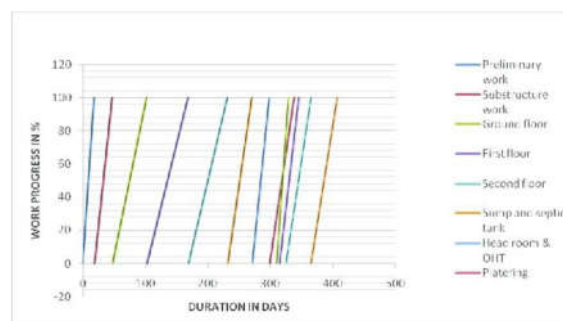


Fig. 3: Gantt Chart

A Gantt chart is another construction scheduling tool, rather than a technique. It is a type of bar chart that encourages stakeholders to structure the project with several levels of details and consider dependencies between tasks. This helps them estimate the duration of the project and identify the critical path to take during construction.

A Gantt chart is a bar chart used to illustrate a project schedule, that includes some milestones and it is not as detailed as a full CPM but explains the balance, adding to that it normally includes start/end dates of activities and a summary of activities of a project.

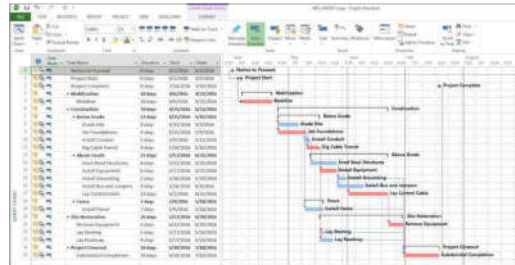


Fig. 4: Gantt Chart

4. Traditional Bar Chart Method:

Bar Charts are the most simple and easiest way to generate construction schedules. It is widely used due to its simplicity and multiple adaptations to numerous events. A bar chart is formed with a list of activities, specifying the start date, duration of the activity and completion date of each activity, and then plotted on a project time scale. The detailed level of the bar chart depends on your project complexity and the intended use of the schedule. Traditional bar chart methods are generally done without using any software and it is less time consuming. It is not applicable for larger constructions.

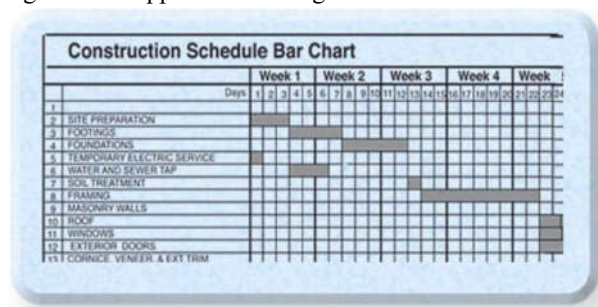


Fig. 5: Scheduling by traditional bar chart method

C. Basic Information of Microsoft Project

Microsoft Project is a project management software programme that Microsoft creates and sells. It's intended to let a project manager create a strategy, assign resources to tasks, measure progress, manage budgets, and analyze workloads. MS project can be used as a standalone tool for tracking project progress or it can be used for tracking complex project distributed in many geographical areas and managed by a number of project managers. Microsoft project is designed to assist a project manager in;

- 1) Developing a plan,
- 2) Assigning resources to tasks,
- 3) Tracking progress,
- 4) Managing budget and
- 5) Analyzing workloads.

D. History of Microsoft Project

'Project' was an MS-DOS software application originally written in Microsoft 'C' (and some assembly) language for the IBM PC. The idea originated from the vision of Ron Bredehoeft, a former IBM S/E and PC-enthusiast in the early 1980s, to express the recipe and all preparation for a breakfast of eggs Benedict in project management terms. Mr. Bredehoeft formed Microsoft Application Services (MAS) during the birth of the application and the company later entered an OEM agreement with Microsoft Corporation. Alan M. Boyd, Microsoft's Manager of Product Development, introduced the application as an internal tool to help

manage the huge number of software projects that were in development at any time inside the company. Boyd wrote the specification and engaged a local Seattle company to develop the prototype.

The first commercial version of Project was released for DOS in 1984. Microsoft bought all rights to the software in 1985 and released version 2. Version 3 for DOS was released in 1986. Version 4 for DOS was the final DOS version, released in 1986. The first Windows version was released in 1990, and was labeled version 1 for Windows.

Microsoft Project 2002 was the first to contain task panes, safe mode, and smart tags, "Type a question for help" in the top right corner, mandatory product activation, like Office XP and Windows XP and ability to open and save Microsoft Project Data Interchange files.

Microsoft Project 2003 was the first to contain Windows XP style icons, like all Office 2003 applications, and the last to contain Office Assistant and to run on Windows 2000. Microsoft Project 2007 was the last to contain the menu bar and toolbars. Office Assistant was removed entirely.

Microsoft Project 2010 was the first to contain ribbon and backstage view, like all Office 2010 applications, and the last to open Microsoft Project 98 and mpx files and to run on Windows XP and Vista. Additionally, it was the first 64-bit version.

Microsoft Project 2013 was the first to contain Modern UI-based look, and introduced Microsoft account and One Drive integration



Fig. 6: Microsoft Project Icon

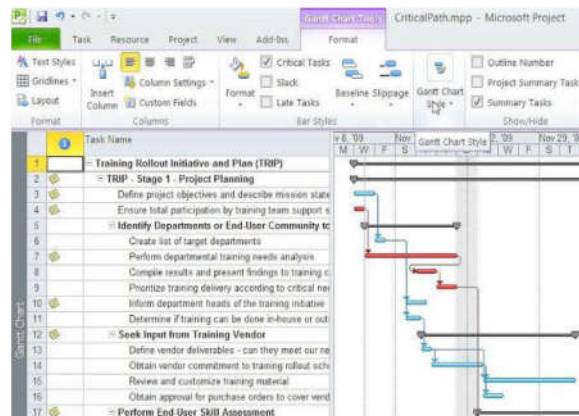


Fig. 7: Working Module of MS Project

E. TYPES OF SCHEDULING IN MS PROJECT

Scheduling can be done in two ways in Microsoft project namely:

1. Manual Scheduling
2. Auto Scheduling

1. Manual Scheduling in Microsoft Project

When working in manually scheduled mode, Microsoft Project does not enforce essential elements of a task and any scheduling principles and rules. It allows user to enter anything. Please look at the Fig. below:

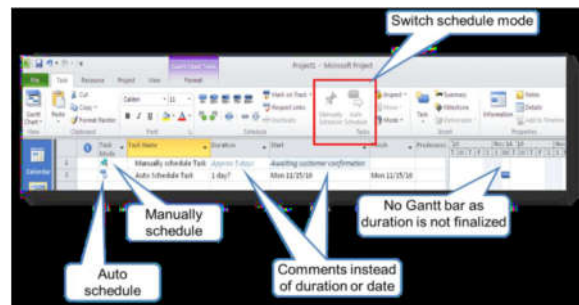


Fig. 8: Manual Scheduling and Auto Scheduling in MS Project

In this Figure, task 1 is scheduled in manual mode and task 2 is scheduled automatic mode. The essential elements of a task like duration, start date and finish date are not enforced on the manually scheduled tasks and users are free to write anything.

Manually scheduled tasks are introduced in Project 2013 version. All the tasks were auto scheduled in all the previous versions. The purpose behind introducing manually scheduled tasks was to provide more flexibility and control to users when they do not have full information in their hands like.

1.1 Characteristics of Manually scheduled mode

Manually schedule mode allows adding tasks with partial information and complete the remaining later

Start, Finish and Duration column can be left blank, hold text value like comments or specify specific date or duration. Especially useful in the beginning of the project when full information is not available.

2. Auto Scheduling in Microsoft Project

Automatically scheduled tasks are the typical way of scheduling the projects. Automatic scheduling provides a highly structured, systematic means of preparing and managing project schedules. Based on the data users provide like task duration, work and resources, the Project calculates the earliest and latest dates for each task for the optimal scheduling.

If anything about our project changes after we creates our schedule, we can update the tasks or resources and Project adjusts the schedule for us. For each task, we might enter durations or work or task dependencies or constraints. Using this information, Project calculates the start date and finish date for each task. Other elements, such as lead time and lag time for links, resource availability etc. can affect scheduling. Therefore understanding the effects of these elements can help you to maintain and adjust your schedule as needed.

F. WORK BREAK DOWN STRUCTURE (WBS)

A work-breakdown structure (WBS) in project management and systems engineering, is a deliverable-oriented breakdown of a project into smaller components. A work breakdown structure is a key project deliverable that organizes the team's work into manageable sections.

A WBS is a visual, hierarchical and deliverable-oriented deconstruction of a project. It is a helpful diagram for project managers because it allows them to work backwards from the final deliverable of a project and identify all the activities needed to achieve a successful project.

All the steps of a project are outlined in the organizational chart of a work breakdown structure, which makes it an essential project management tool for planning and scheduling. The final deliverable rests on top of the diagram, and the levels below subdivide the project scope to indicate the phases, deliverables and tasks that are needed to complete the project.

A work-breakdown structure element may be a product, data, service, or any combination thereof. A WBS also provides the necessary framework for detailed cost estimation and control while providing guidance for schedule development and control.

A work breakdown structure, clearly, is a very flexible tool. It can take form as a simple numbered list (also known as an outline view), a basic tree diagram or even a Gantt chart. When a Gantt chart is part of a larger project management tool, the WBS can segue into planning, assigning, monitoring and tracking the progress of your team.

G. Use of WBS

Making a WBS is the first step in developing a project schedule. It defines all the work that needs to be completed (and in what order) to achieve the goals and objectives of the project. By visualizing your project in this manner, you and your resources can collaborate on defining mission critical tasks, their subtasks and the inter-dependencies between them.

A well-constructed WBS helps with important project management processes such as cost estimation, resource allocation, and risk assessment. In addition, a WBS helps avoid common project issues such as missed deadlines, scope creep and cost overrun, among others.

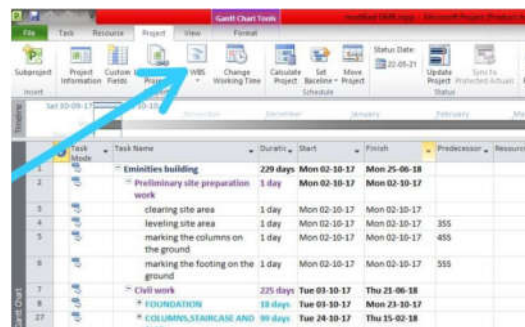


Fig. 9: WBS Gantt chart in MS Project

II. LITURATURE REVIEW

A. Nikhil R. Mahajan and M. V. Bhogone (2017)

They used an approach that compared Microsoft Project and the Traditional Method. Both a conventional and a prefabrication schedule was created. For comparison, a residential building was used. The programme utilized was MSP, and the time needed to complete the job was obtained from the appropriate business. The comparison was conducted by comparing the overall time required for completion with the MSP project using the critical path method. The results reveal that the total duration for both the conventional and prefabrication methods is the same, however prefab building costs 13% more than conventional but cuts the project duration by 63 days.

B. Rhuta Joshi and Prof. V.Z. Patil (2015)

Rhuta Joshi and Prof. V.Z. Patil investigated project management techniques for residential construction by scheduling various construction tasks, allocating resources, and resource levelling using Microsoft Project 2013. The research was split into two parts. In the first step, data was collected on site, quantities were computed according to the drawing, and personnel requirements were determined. MSP 2013 specified the second phase of construction activity. As a result of the reduction in resources, duration increased by 10.38 percent and cost increased by 0.94 percent.

C. Rashmi J.V. and Amey A. Kelkar (2017)

They looked at the planning and scheduling of a multi-story building in two phases using a traditional execution approach, and then looked at the same building again using MSP to compare the results for justification. To estimate the overall cost and time required to construct a multi-story residential building, they used G+3 with basement and the kind of RCC frame structure. According to the findings of their study, good project management skills and techniques cut time by 23.2 percent and cost by 3.14 percent.

C. E. Suresh kumar and S. Krishnamoorthi (2015)

They concentrated their research on MSP scheduling and earning value analysis for an apartment complex. As a result, the time necessary for the cost overrun procedure is reduced. The project schedule is considered the heart of the project plan, and its aim is to demonstrate the organization how the work will be done so that problems may be identified. Following the conclusion of the project, it was discovered that the budget cost and actual cost differed significantly, and that the cost increased as the material price increased. The earned value analysis is used to determine the project's variance cost.

D. Wallance Agyei (2015)

The goal of the study was to determine the difference between the project's cost and the minimum projected time to finish it. The analysis was done using both

CPM and PERT approaches, and the conclusion was that the timetable recommended by the bus takes significantly less time to complete than the actual time taken by the process.

III. INTRODUCTION TO MICROSOFT PROJECT

Any construction project to begin with starts with the Layout of the building or structure followed by Design and Analysis of the structure which is succeeded by cost estimation and planning for the said project. This project involves scheduling and planning of a G+5 residential building located.

For completing the project Civil Engineering software Microsoft Project is used for planning and scheduling.

A. GANTT Chart

This is a horizontal bar chart plotted over time (e.g. days, weeks or months). Each activity is shown as a bar (its length based on a time estimate). Depending on task dependencies and resource availability, these bars may be sequential, or run in parallel. Each bar is plotted to start at the earlier possible start date. The plan laid out when the GANTT Chart was created can be compared with actual times taken (plotted below the planned time bars in the chart)

B. Role of Microsoft Project

Microsoft Project is a project management software tool created and sold by Microsoft that helps project managers create schedules, assign resources to tasks, measure progress, and analyze workloads.

As resources are assigned to tasks and assignment work is estimated, the programme calculates the cost, which is equal to the work multiplied by the rate, and rolls up to the task level, then any summary task, and finally the project level. Each resource can have its own calendar, indicating which days and shifts it is available on.

Project is a powerful program that you can use to plan and manage a wide range of projects. From meeting crucial deadlines and budgets to selecting the right resources, you can be more productive and realize better results by using the set of features Project offers.

C. Methodology

Methodology Flowchart:

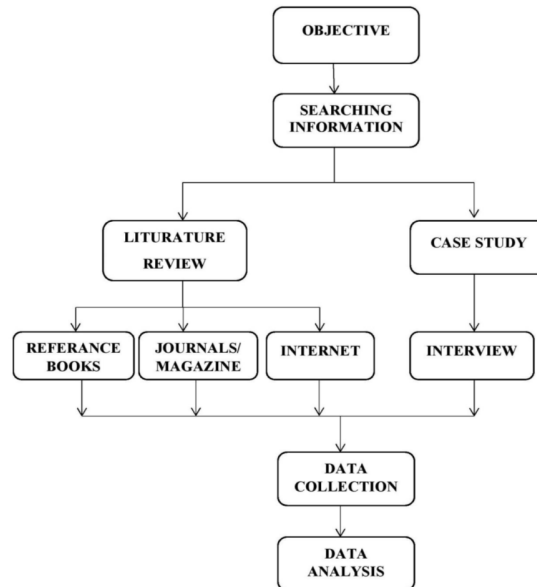


Fig. 10: Methodology flowchart

Many construction businesses are currently experiencing issues with regard to the amount of time it takes to complete a project, the expense it incurs, and the delays it causes. Typically, these issues arise when a project is not adequately scheduled or planned. Project scheduling entails and explains to clients the sequence of actions that must be followed in order to complete the project. From the beginning to the end, this project study provides information about the project. We will be able to know how to effectively schedule the activities in a building construction after the study is completed.

Many construction businesses are currently experiencing issues with regard to the amount of time it takes to complete a project, the cost it incurs, and the delays that occur. These issues typically arise when a project isn't adequately scheduled or planned. Customers are involved in project scheduling, which involves and explains the sequence of activities that must be followed for the project to be completed.

From the beginning through the end of the project, this project study provides information. We will be able to know how to organize the activities in a building construction project in an efficient manner once the study is completed.

IV. SEARCHING INFORMATION

A. Literature Review: For the projects described in Chapter 2, many literatures were reviewed.

Books of Reference: For the submitted work, the following publications were recommended: 'Project Management: A Systems Approach to Planning, Scheduling, and Controlling,' 'A Guide to the Project Management Body of Knowledge,' and 'Brilliant Project Management: What the Best Project Managers Know, Do, and Say.'

B. Journals/Magazines: Some international journals, such as Science Direct, Indian Journal of Research, IJRET, and IOSR for Mechanical and Civil Engineering, were also consulted to learn more about previous Microsoft Project work.

V. CASE STUDY

The current research looked at a multi-story residential building that was constructed utilizing traditional procedures. The G+5 residential building at VANI NAGAR, MALKAJGIRI, TELANGANA in India was chosen for this case. The bar chart of the constructed structure, which contains scheduled activities and time taken for project completion, site data, plans and drawings, and

so on, was used to achieve the project's goals. Reinforced Cement Concrete Structure (RCC) G + 5 Residential Building is the type of structure.

A. Interview

We had organized an interview with the respective construction company's Senior Engineer and Project Coordinator in Hyderabad, India, for the offered task. The primary goal of the interview was to determine the issues that arose throughout the project's execution and to collect statistics on the construction (i.e., a bar chart). The issues could be related to labor tiredness, project duration, project completion delays, resource under or over allocation, and so on.

B. Data Collection

Data gathering is critical for any project since it allows you to correlate different data and use it in Microsoft Project 2010. The start and end dates of various activities might be included in this data collection.

The following data has been collected from a site engineer of the construction project.

The collected data is regarding the multi-storied building which completed by year 2018. The given data is in the form of bar chart consisting of various activities in that construction and time required for the completion of that activity.

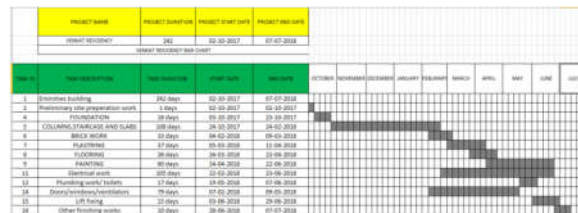


Fig. 11: Bar chart

C. Data Analysis Using Ms Project

The company's data was evaluated and broken down into activities and sub-activities. Work Breakdown Structure was used to assess the activities, and Microsoft Project was used to schedule them properly.

D. Scheduling With Gantt Chart And WBS Create A Timeline In Microsoft Project

Microsoft Project doesn't have a Timeline template, so you'll need to enter data manually to build a Microsoft Project Timeline. It's probably because it's the most basic feature and a template isn't needed to get started.

E. Create a calendar

The project calendar is mostly used to determine the days and times when the project will be completed. It also aids in the establishment and assignment of tasks to specific days. It also aids in allocating resources to specific activities for specific days. So, by glancing at the project calendar, one can see which days the organization or construction firm will be working on their project and which days they will not be. There are three basic calendars in MS Project 2010. So, when creating a basis calendar for any project, you can choose from one of MSP 2010's three basic calendars, or you can make your own.

A base calendar is a calendar template that can be used for a group of resources, a collection of tasks, or the entire project.

Following are the three base calendars that are defined by the MS Project 2010:

1. Standard base calendar: According to this base calendar, working days are from Monday to Friday and timing followed is 9 am to 6 pm. According to this calendar, lunch timing will be from 12 noon to 1 pm. This is the default base calendar used for the project, for task, and for resource.
2. Night shift base calendar: According to this calendar, working days will be from Monday to Friday and working timing will be from 11:00 pm to 8 pm with one hour off from 3 am to 4 am. It is basically used to work for the projects that will be carried on at night shifts.
3. 24 hours base calendar: According to this calendar, one has to work from midnight to midnight for seven days a week. This base calendar is usually practiced by manufacturing companies. Any of the three above mentioned base calendars can be used as resource calendar or project calendar or task calendar or all the three calendars can be used at a time.

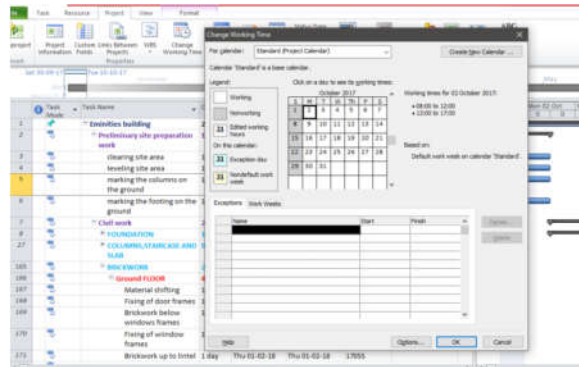


Fig. 12: creating a calendar

F. Create a Task List

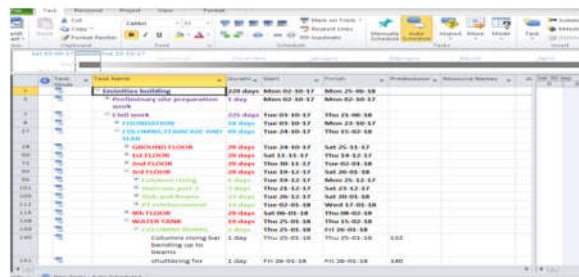


Fig. 13: Creating a task

E. Add Start and Finish Dates to Each Task

To enter start and end dates, click the Start cell that corresponds to the first task and enter a date (if you click the down arrow in the cell, a calendar will appear and you can use that to select a date). Then tab over to the Finish row and enter an end date. Microsoft will automatically enter the amount of time it will take to complete the task in the Duration row. You'll notice that as you add the dates, bar charts will be added to the timeline in the right-hand pane.

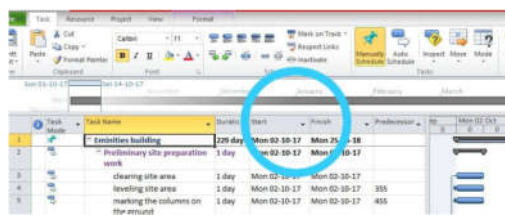


Fig. 14: Adding Start and Finish Dates

F. Add Tasks to the Timeline

To add tasks to the Timeline, click the view tab and click the timeline bar that appears above the task list. Then right-click on a Task cell and choose Add to Timeline from the list and click it to add the task to the timeline.

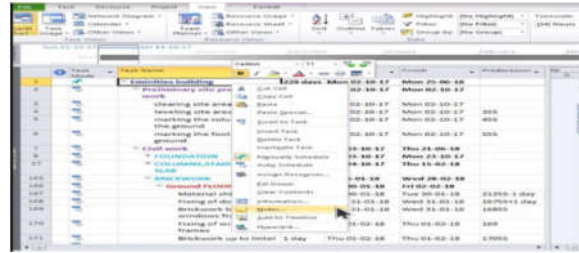


Fig. 15: Adding Tasks to the Timeline

VI. SCHEDULE TASKS AUTOMATICALLY OR MANUALLY

With Microsoft Project 2016 you can schedule tasks manually or automatically. When you opt to manually schedule tasks it's up to you schedule all new tasks and track them to ensure they are being completed on time. If you choose Automatic scheduling, Project will schedule tasks based on dependencies, calendars, and constraints among other things.

A. Access Microsoft Project Settings



Fig. 16: Access Settings

B. Change Schedule Options

When the Project Options form appears on the screen, click Schedule in the left column

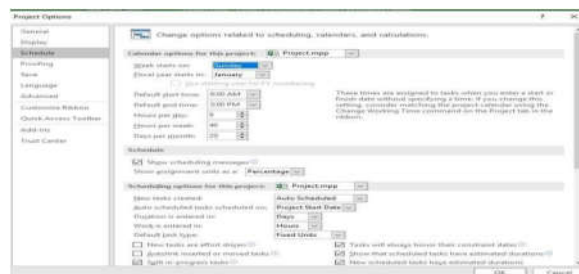


Fig. 17: Project section

You should still be in the View Tab. Click the Details box in the ribbon. The Task Form should appear on the lower half of the screen. If it doesn't appear, click the down arrow in the Details box and select Task Form.

Next, under Scheduling Options for this Project section, click the drop-down menu for New Tasks Created. The default is set to Manually Scheduled. Select and click Auto Scheduled and click the OK button.

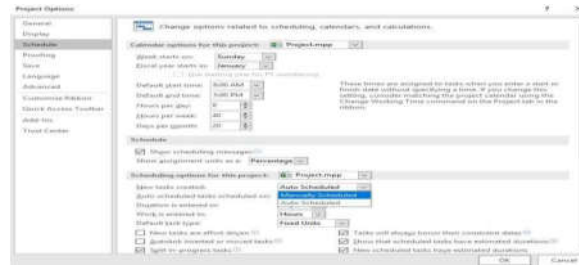


Fig. 18: Scheduling Option

C. Create Task Dependencies

Dependencies occur when one task can't move on to the next phase until a particular task is completed before it. Creating dependencies involves linking tasks in the Gantt chart view. In Microsoft Project, you can link any two tasks. Once tasks are linked, every change made to the predecessor affects the successor

D. Select Tasks to Link

You should still be in the Gantt chart view. If you're not, click the Gantt chart icon in top left corner of the window. Click the Task tab in the menu bar. Identify the

two tasks in the list that you want to link. Click the first task and press and hold the Ctrl key and select the second task. Click the chain icon in the ribbon to link the tasks. You'll see an arrow appear on the Gantt chart that connects the item.

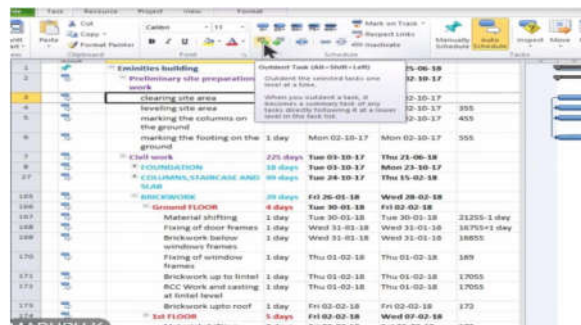


Fig. 19 Linking Tasks

E. Update Tasks

Sometimes tasks fall behind or get accomplished ahead of schedule. You can use the Update Task option to update the status. Click the down arrow next to Mark on Track and click Update Tasks.

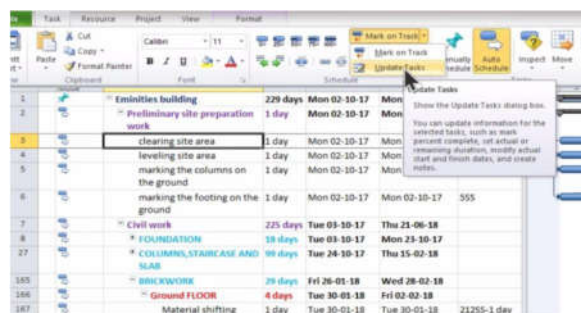


Fig. 20: Update Tasks

VII. RESULTS AND DISCUSSION

The data collected from the site engineer is analyzed. The method adopted for planning and scheduling is the most important factor which influenced the time in the project. The analysis has shown that the company has used traditional bar chart method for planning and scheduling. This method is the most simple and easiest way to generate construction schedules. The traditional bar chart cannot indicate clearly the independencies among various activities. By using this method the construction is completed in 242days. For the same project we have done scheduling using Microsoft Project software. The result obtained by our scheduling shows that the estimated time of completion of this project is 229 days. Scheduling using Microsoft Project software has reduced the time duration for the completion of construction by 13days. Linking of activities is made easy by the software .This clearly indicated the independencies among various activities.

VIII. CONCLUSIONS

This study concludes that the primary cause of time overruns in construction projects is due to lack of effective planning and scheduling. The time overrun or delay can be reduced by effective planning and scheduling of the activities using Microsoft Project Software. Work Breakdown Structure format in MSP helps in linking up varies activities and sub activities and also reduces the confusion while scheduling. Scheduling of parallel activities in large constructions can be done effectively with MSP. It is concluded that the required for completing the project as per our scheduling using MSP is 13days prior to the planning and scheduling using traditional bar chart method. Hence this method of scheduling is more scientific. Planning and scheduling using MSP can be done more effectively by resource allocation that is planning and scheduling of labours and materials which gives us brief information about activities in construction project. This further reduces the duration of the project. It is easy to track and adjust by this method. Scheduling using MSP is applicable for all types of construction.

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