CONTENTS

Group A

1. Create Project Plan
    - Specify project name and start (or finish) date.
    - Identify and define project tasks.
    - Define duration for each project task.
    - Define milestones in the plan
    - Define dependency between tasks
    - Define project calendar.
    - Define project resources and specify resource type
    - Assign resources against each task and baseline the project plan

2. Execute and Monitor Project Plan
    - Update % Complete with current task status.
    - Review the status of each task.
    - Compare Planned vs Actual Status
    - Review the status of Critical Path
    - Review resources assignation status

3. Generate Dashboard and Reports
    - Dashboard
        - Project Overview
        - Cost Overview
        - Upcoming Tasks
    - Resource Reports
        - Over-allocated Resources
        - Resource Overview
    - Cost Reports
        - Earned Value Report
        - Resource Cost Overview
        - Task Cost Overview
    - Progress Reports
        - Critical Tasks
        - Milestone Report
        - Slipping Tasks

Schedule Estimation using Gantt Chart.

Aim: Schedule Estimation using Gantt Chart

Theory:

Introduction

Gantt chart is a type of a bar chart that is used for illustrating project schedules. Gantt charts can be used in any projects that involve effort, resources, milestones and deliveries.

At present, Gantt charts have become the popular choice of project managers in every field. Gantt charts allow project managers to track the progress of the entire project. Through Gantt charts, the project manager can keep a track of the individual tasks as well as of the overall project progression.

In addition to tracking the progression of the tasks, Gantt charts can also be used for tracking the utilization of the resources in the project. These resources can be human resources as well as materials used.

Gantt chart was invented by a mechanical engineer named Henry Gantt in 1910. Since the invention, Gantt chart has come a long way. By today, it takes different forms from simple paper based charts to sophisticated software packages.

The underlying concept of a Gantt chart is to map out which tasks can be done in parallel and which need to be done sequentially. If we combine this with the project resources we can explore the trade-off between the scope (doing more or less work), cost (using more or less resources) and the time scales for the project. By adding more resources or reducing the scope the project manager can see the effect on the end date.

A Gantt chart displays information visually as a type of bar chart in a clear and easy-to- understand way and is used for the following activities:

- Establish the initial project schedule
- Allocate resources
- Monitor and report progress
- Control and communicate the schedule
- Display milestones
- Identify and report problems

To create a chart you need to know all of the individual tasks required to complete the project, an estimate of how long each task will take and which tasks are dependent on others. The very process of pulling this information together helps a project manager focus on the essential parts of the project and begin to establish a realistic timeframe for completion.

The Use

As we have already discussed, Gantt charts are used for project management purposes. In order to use Gantt charts in a project, there are a few initial requirements fulfilled by the project.

First of all, the project should have a sufficiently detailed Work Breakdown Structure (WBS). Secondly, the project should have identified its milestones and deliveries.

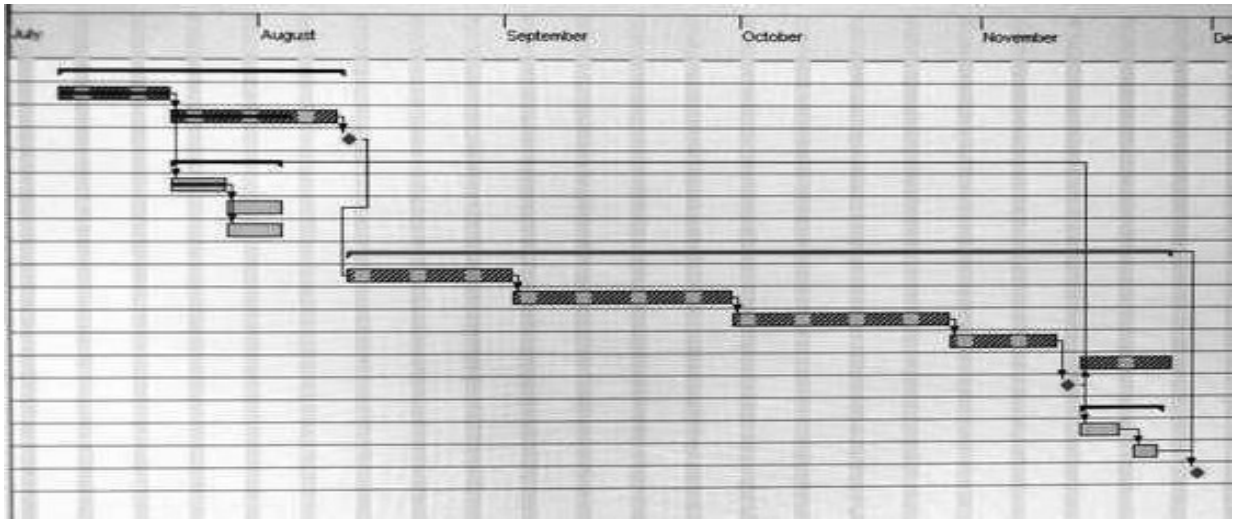
In some instances, project managers try to define the work break down structure while creating Gantt chart. This is one of the frequently practised errors in using Gantt charts. Gantt charts are not designed to assist WBS process; rather Gantt charts are for task progress tracking.

Gantt charts can be successfully used in projects of any scale. When using Gantt charts for large projects,there can be an increased complexity when tracking the tasks.

This problem of complexity can be successfully overcome by using computer software packages designedfor offering Gantt chart functionalities.

Tools Available

There are dozens of Gantt chart tools that can be used for successful project tracking. These tools usuallyvary by the feature offered.



The simplest kind of Gantt chart can be created using a software tool such as Microsoft Excel. For thatmatter, any spreadsheet tool can be used to design a Gantt chart template.
If the project is small scale and does not involve many parallel tasks, a spreadsheet based Gantt chart can be the most effective type.

Microsoft Project is one of the key Gantt chart tools used today. Especially for software development projects, MS Project based Gantt charts are essential to track the hundreds of parallel tasks involved in thesoftware development life cycle.
There are many other Gantt chart tools available for free and for price. The features offered by these tools range from the same features offered by Excel based Gantt charts to MS Project Gantt charts. These tools come with different price tags and feature levels, so one can select the suitable Gantt chart tool for the purpose in hand.

Creating Your Own
Sometimes, one may decide to create their own Gantt chart tool without buying an existing one. If this is thecase, first of all, one should search the Internet for free Gantt chart templates.

This way, one may actually find the exact Gantt chart template (probably in Excel) required for the purpose. In case, if no match is found, then it is sensible to create one's own.
Excel is the most popular tool for creating custom Gantt charts. Of course, one can create a Gantt chart from scratch in Excel, but it is always advisable to use a Project Management add-on in Excel to create Gantt charts. These project management add-ons are published by Microsoft and other third-party companies.

Why Use Gantt Charts?

When you set up a Gantt chart, you need to think through all of the tasks involved in your project. As part of this process, you'll work out who will be responsible for each task, how long each task will take, and what problems your team may encounter.

This detailed thinking helps you ensure that the schedule is workable, that the right people are assigned to each task, and that you have workarounds for potential problems before you start.

They also help you work out practical aspects of a project, such as the minimum time it will take to deliver, and which tasks need to be completed before others can start. Plus, you can use them to identify the critical path – the sequence of tasks that must individually be completed on time if the whole project is to deliver on time.

Finally, you can use them to keep your team and your sponsors informed of progress. Simply update the chart to show schedule changes and their implications, or use it to communicate that key tasks have been completed.

Advantages & Disadvantages:

The ability to grasp the overall status of a project and its tasks at once is the key advantage in using a Gantt chart tool. Therefore, upper management or the sponsors of the project can make informed decisions just by looking at the Gantt chart tool.

The software-based Gantt charts are able to show the task dependencies in a project schedule. This helps toidentify and maintain the critical path of a project schedule.

Gantt chart tools can be used as the single entity for managing small projects. For small projects, no other documentation may be required; but for large projects, the Gantt chart tool should be supported by other means of documentation.

For large projects, the information displayed in Gantt charts may not be sufficient for decision making. Although Gantt charts accurately represent the cost, time and scope aspects of a project, it does not elaborate on the project size or size of the work elements. Therefore, the magnitude of constraints and issues can be easily misunderstood.

Conclusion :

Gantt chart tools make project manager's life easy. Therefore, Gantt chart tools are important for successful project execution. Identifying the level of detail required in the project schedule is the key when selecting a suitable Gantt chart tool for the project.

Group A

EXPERIMENT No: 1

Problem Statement :

Create Project Plan

- Specify project name and start (or finish) date.
- Identify and define project tasks.
- Define duration for each project task.
- Define milestones in the plan
- Define dependency between tasks
- Define project calendar.
- Define project resources and specify a resource type
- Assign resources against each task and baseline the project plan

Objectives :

- To learn various techniques , tools , applications in software project management .
- To understand effective communication , collaboration , and productive guidelines .
- Meet the exclusive needs and requirements of client .
- Achieve project goals within the estimated time with high quality .
- Development and Implementation of Procedure .

Theory :

Project Plan :

A **project pla**n is a series of formal documents that define the execution and control stages of a project. The plan includes considerations for risk management, resource management and communications, while also addressing scope, cost and schedule baselines. Project planning softwareis used by project managers to ensure that their plans are thorough and robust.

Elements of Project planning :

How to create a project calender ?

Step 1 - Review Scope Baseline

Gather the team and review the approved scope baseline, which consists of three components:

1) the Scope Statement

2) the Work Breakdown Structure (WBS) and the WBS Dictionary.

3) The project team member should confirm that the scope baseline addresses 100% of the project scope.

Step 2 - Create Activities

Using a technique called Decomposition, the project team breaks down each WBS work package into activities. Just like when creating the WBS work packages, the team needs to set rules for creating schedule activities. The final schedule needs to be the one that is effective and efficient. Too many activities can be as bad as too few. It is also important to identify deadlines and milestones while decomposing the project.

Step 3 - Sequence Activities

Every activity is related to one or more other activities. Every activity, except the first and last, has a relationship with a predecessor and a successor. Sequencing activities means placing the activities in the right order using the right relationships. There are four types of relationships:

- **1. Finish to Start –** Cannot start the successor activity until its predecessor Is finished.

- **2. Start to Start –** Cannot start the successor activity until its predecessor has started.
- **3. Start to Finish –** Cannot finish the successor activity until its predecessor had started.
- **4. Finish to Finish –** Cannot finish the successor activity until its predecessor has finished.

Relationships 1 and 2 are the most commonly used. Finish to Start is a sequential relationship andStart to Start is typically a parallel or over-lapping relationship.

Step 4 - Estimate Resources :

Before the durations can be estimated, resources must be identified and estimated. Resources include labor, material and equipment. There are several estimating techniques used including Analogous, Parametric, Three-Point and Bottom Up. Skills, competencies and technology are key factors to consider in the basis of the estimate. After estimating the resources, they are loaded in the schedule against the respective activities. A resource calendar is also created to show when resources are needed and available.

Step 5 - Estimate Durations :

Duration is the time between the start and end of an activity. Review the resources, relationships and sequencing, then estimate the duration for each activity. The same estimating techniques used for estimating resources can be used to estimate durations, but make sure you identify constraints. Which are limitations or restrictions on an activity.

Step 6 - Develop Schedule

Create the Gantt chart by loading all information into a project management software tool. Review the schedule and ensure that all schedule risks have been addressed. Check that response plans and schedule contingencies have been included. A typical way to address schedule contingencies is to addBuffers at the activity level, the project level or both. A Buffer is an activity with no resources or scope to provide additional time and reduce schedule risks. Resource optimization techniques, such as resource smoothing or leveling are used to create realistic schedules. Review and approve the schedule. The approved Gantt chart schedule becomes the schedule baseline

Input :

1) Project or program charter .
2) Baseline for Scope , Schedule , and Cost .
3) Requirements
4) Agreements
5) Management plans for Scope , Schedule , Cost , Quality , Human Resources , Communication , Risk and Procurement .

Output :

1) Deliverables.
2) Work Performance Data.
3) Issue Log.
4) Change Requests.
5) Project Management Plan Update.
6) Project Document Update
7) Organization process Assets Updates

Testcases :

1) Completeness
2) Clarity
3) Sufficient Data
4) Reference to dependent cases

Software Requirements :

1) MS Project
2) Gantt Project
3) Primavera

Hardware Requirements : N/A

Output of Primavera

Frequently Asked Questions :

1) What is PERT in Project Management ?

➔ A PERT Chart is a Project Management Tool that provides a graphical representation of a projecttimeline

➔ The Program Evaluation Review Technique (PERT) break down the individual task of project for analysis.

2) What is Resource Allocation in Project Management ?

➔ Resource Allocation is the process of assigning and scheduling available resource in the mosteffective and economical way possible .

➔ It is the Management and delegation of resources throughout the project to ensure that it runs assmoothly and successfully as possible .

3) What is the Gantt Chart in Project Management ?

➔ A Gantt Chart is the Project Management Tool assisting in the planning and scheduling of projects of all sizes , although , they are particularly useful for simplifying complex project .

➔ As its in a bar chart format it is possible to check on progress with a quick glance

4) What are the main factors to consider when deciding whether to build or purchase software ?

➔ When determining whether to purchase software or begin building software, you must consider many factors about your organization, your available resources, and the project scope the software is intended to resolve. These include the number of internal and external software users, how quickly the problem needs to be resolved, who you can assign to deploy a solution, how many processes will be affected by a new software, and the cost of a solution.

5) What is WBS ?

➔ A work breakdown structure is a project management tool used to define and manage a project's deliverables. The WBS is a hierarchical structure that breaks down complex activities into more manageable parts, allowing users to see the individual deliverables that need to be completed in order to reach a project's overarching goal.

➔ While most project management tools focus on planned actions, a WBS focuses on planned outcomes. A carefully organized WBS can help a project manager more effectively oversee the completion of otherwise complicated tasks within a project. A WBS with measurable, clearly definedtasks can also help project management assign accurate costs and deadlines to a project, simplifying project planning and monitoring.

EXPERIMENT No: 2

Problem Statement :

Execute and Monitor Project Plan

- Update % Complete with current task status.
- Review the status of each task.
- Compare Planned vs Actual Status
- Review the status of the Critical Path
- Review resources assignation status

Objectives :

To learn various techniques, tools, applications in software project management .
To understand efficient methods for planning the projects.
To monitor and execute projects with a plan.

Theory :

Software Project Management is dedicated to the planning, scheduling, resource allocation, execution tracking, and delivery of software and projects.

The project management processes consist of initiating the project. Here the project manager writes the business case and project charter. The project manager also carries out the planning processes that completes the work breakdown structure and performs project schedule cost estimation and so on.

Then the project manager carries out execution processes, which performs necessary action to complete work as outlined in the plan , but then during the execution process there may be deviations from the plan .

The project manager needs to carry out the monitoring and control processes where the project manager checks whether project is proceeding as plan or there are deviations . The project manager takes corrective actions to the progress of project with the plan and finally , the project manager needs to carry out closing processes , where closing documents are created and the customer finally gives the formal acceptance of project ,

Any project, whether big or small, has the potential to be very complex. It's much easier to break down all the necessary inclusions for a project plan by viewing your project in terms of phases. The Project Management Institute, within the Project Management Book of Knowledge (PMBOK), have identified the following 5 phases of a project:

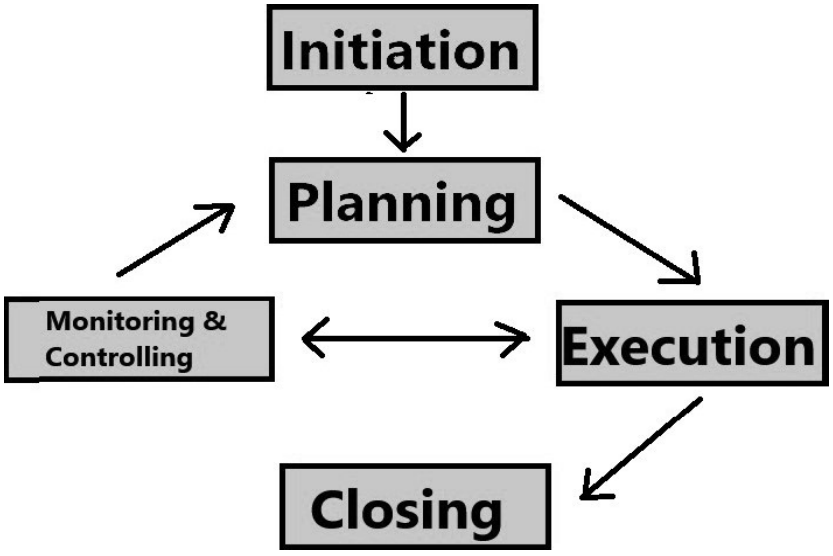
- **Initiation**: The start of a project, in which goals and objectives are defined through a business case and the practicality of the project is determined by a feasibility study.

- **Planning**: During the project planning phase, the scope of the project is defined by a work breakdown structure (WBS) and the project methodology to manage the project is decided on. Costs, quality and resources are estimated, and a project schedule with milestones and task dependencies is identified. The main deliverable of this phase is your project plan.

- **Execution**: The project deliverables are completed during this phase. Usually, this phase begins with a kick-off meeting and is followed by regular team meetings and status reports while the project is being worked on.

- **Monitoring & Controlling**: This phase is performed in tandem with the project execution phase. Progress and performance metrics are measured to keep progress on the project aligned with the project plan.

- **Closure**: The project is completed when the stakeholder receives the final deliverable. Resources are released, contracts are signed off on and, ideally, there will be an evaluation of the successes and failures.



The project manager has three main objectives during the execution phase :

1) Manages People
2) Manages Process
3) Manages communication

The benefits of a well-executed project are threefold :

- The project can be completetd on time and budget
- Team moral can be maintained
- Stakeholders are satisfied with overall project progress

The 6 phases of project monitoring are :

- Identify goals of a project
- Define the indicators

- Define data collection methods and training
- Identify roles and responsibilities during monitoring
- Create an analysis plan and report templates
- Plan data disclosure

Input :

1) Project Management Plan.
2) Project Document.
3) Work Breakdown Structure (WBS).

Output :

- Project deliverables are tangible outputs of project . They need to be reviewed and meet acceptance by clients.
- Change Requests : When client expectations change or there's a disconnect between team members.
- The execution stage produces a lot of data points that you can use to optimize your team's performance.
- Whenever there are bug issues or defects your documents are there in issue log.

Testcases :

1) Completeness
2) Clarity
3) Sufficient Data
4) Actual results
5) Environment

Software Requirements :

1) MS Project
2) Gantt Project
3) Primavera

Conclusion :

We have successfully installed Gantt Project and Completed project plan for the project .

Frequently Asked Questions :

1) **What does project monitoring and controlling means ?**

➔ Project Monitoring is the process of keeping a close eye on entire project management life cycle and ensure project activities are on right tasks .
➔ Controlling is an effective tool to ensure project goals and time frames.

2) **What is the difference between project monitoring and project evaluation ?**

➔ Monitoring is a continuous activity performed at functional level of management .
➔ Evaluation is a periodic activity , performed at business level .

3) **What is Critical Path in project management ?**

➔ The critical path method provides a structured approach to project scheduling, allowing you to identify the operations most important for successful project completion.
➔ The critical path (or paths) is the longest path (in time) from Start to Finish; it indicates the minimum time necessary to complete the entire project.

4) **Explain the importance of Project Plan.**

➔ Project planning is an important step in the overall project management :

- Ideation - The project planning is an important step to collate ideas from the customer, vendors, your team, top management, and your thoughts and put them in learning. This entails us to research further and know the gaps if there any.

- Reflect from the previous projects - The project planning is used to document and correct the ways and identify the risks and treat them so that this project does not go wary.

- Document the Project Plan - Document everything necessary such as risks, previous project failures and work around, the resources needed, time frame, cost and budget, contingency plan, etc. This ultimately helps the project for the successful completion .

5) **What is Project Scheduling and explain its importance ?**

➔ Scheduling in project management is the listing of activities, deliverables, and milestones within aproject. A schedule also usually includes a planned start and finish date, duration, and resources assigned to each activity.
➔ Scheduling helps you keep track of everything – from scheduling staff to booking appointments, from delegating tasks to tracking deadlines, from measuring your progress to managing your workforce, and much more.