

CSE432

Software Project Management

Practical File

Submitted to
AMITY UNIVERSITY, UTTAR PRADESH



In partial fulfilment of the requirements for the award of the degree of
Bachelor of Technology
In
Computer Science & Engineering

Submitted By:

Karthikeya Singh

A2305220422

7CSE-2 Y-Batch

Submitted to:

Dr. Abhishek Singhal

DEPARTMENT OF AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY
AMITY UNIVERSITY NOIDA UTTAR PRADESH

Lab-2

Topic: Railway Reservation System

Aim: To create an activity table that outlines the sequential tasks and their interdependencies throughout the project's lifecycle.

Theory:

The activity table serves as a visual representation of the project's timeline and the tasks required to achieve its successful completion. It plays a crucial role in project management by providing a structured framework that guides the project team, allocates resources efficiently, and enables effective tracking of progress.

In the context of the Railway Reservation System development, the activity table outlines various phases and activities. The table includes columns for activity description, dependencies on preceding tasks, start and end dates, assigned resources, and current status.

The first entry in the activity table is the "Project Kick-off." This signifies the start of the project and has no dependencies on prior tasks. Subsequent activities build upon each other, with dependencies ensuring that tasks are completed in a logical order.

For instance, the "Requirements Gathering" activity depends on the successful completion of the "Project Kick-off." This is because requirements cannot be gathered until the project's scope and objectives are well-defined. Similarly, "System Design" relies on the outcomes of the requirements gathering phase to design the architecture.

The "Backend Development" and "Frontend Development" activities have dependencies on the "System Design," as they involve implementing the designed components. "Integration" follows these development phases, ensuring that the backend and frontend work seamlessly together.

The "Testing" and "User Testing" phases depend on the successful integration of components, as they require a fully functioning system to validate its functionality and usability. The "Refinement" activity addresses any issues identified during testing, leading to a polished product.

"Deployment" marks the transition from development to the operational phase. Subsequent activities involve creating documentation, providing training, and eventually launching the system for public use.

The final activity, "Post-Launch Support," signifies the continuous effort required to maintain and improve the system after its release.

Activity	Description	Dependencies	Start Date	End Date	Resources	Status
Project Kick-off	Start of the project	None	2023-09-01	2023-09-01	Project Manager	Completed
Requirements Gathering	Gather user and system requirements	Project Kick-off	2023-09-02	2023-09-08	Business Analyst	In Progress
System Design	Create a high-level design of the system	Req. Gathering	2023-09-09	2023-09-15	System Architect	Not Started
Database Design	Design the database schema	System Design	2023-09-16	2023-09-22	DB Designer	Not Started
UI Design	Design the user interface	System Design	2023-09-16	2023-09-22	UI/UX Designer	Not Started

Activity	Description	Dependencies	Start Date	End Date	Resources	Status
Backend Development	Develop the core backend functionality	Database Design, System Design	2023-09-23	2023-10-14	Dev Team	Not Started
Frontend Development	Implement the user interface	UI Design, System Design	2023-09-23	2023-10-14	Dev Team	Not Started
Integration	Integrate the frontend and backend	Backend Dev, Frontend Dev	2023-10-15	2023-10-22	Dev Team	Not Started
Testing	Test the system for functionality and bugs	Integration	2023-10-23	2023-10-29	QA Team	Not Started
User Testing	Allow users to test the system	Testing	2023-10-30	2023-11-03	Users	Not Started
Refinement	Address issues from user testing	User Testing	2023-11-04	2023-11-10	Dev Team	Not Started
Deployment	Deploy the system for public use	Refinement	2023-11-11	2023-11-13	DevOps Team	Not Started
Documentation	Create user and technical documentation	Deployment	2023-11-14	2023-11-20	Tech Writer	Not Started
Training	Train users and support teams on the system	Documentation	2023-11-21	2023-11-25	Trainers	Not Started
Launch	Officially launch the Railway Reservation System	Training	2023-11-26	2023-11-27	Project Manager	Not Started
Post-Launch Support	Provide ongoing support and maintenance	Launch	2023-11-28	Ongoing	Support Team	Not Started

Conclusion:

The activity table serves as a valuable tool in project management, offering a clear overview of the project's progression. It aids in resource allocation, time management, and efficient task coordination. In the case of the Railway Reservation System development, the activity table illustrates the sequence of tasks required to create a functional and user-friendly system, ensuring that each phase builds upon the success of its predecessors.

Lab-3

Aim:

To draw PERT (Program Evaluation and Review Technique) chart for "Railway Reservation System".

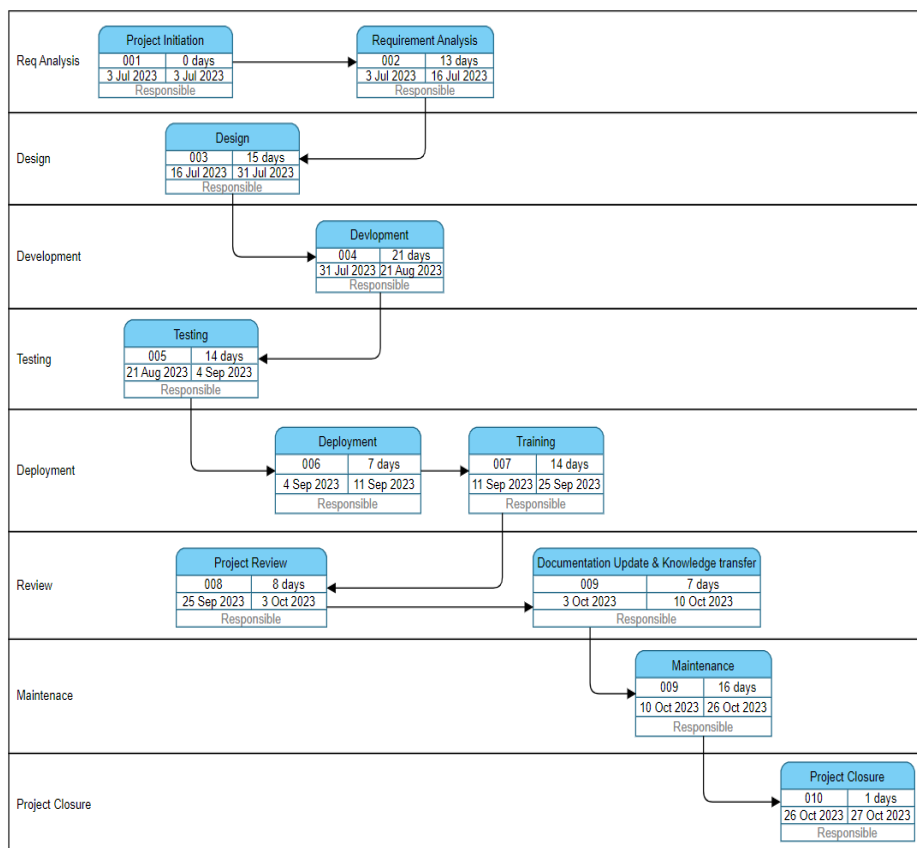
Theory:

The Program Evaluation and Review Technique (PERT) is a project management tool that assists in planning and scheduling complex projects. PERT charts facilitate the visualization of project tasks, their interrelationships, and the anticipated time required for each task's completion. This technique acknowledges the inherent uncertainty in project timelines and incorporates optimistic, pessimistic, and most likely time estimates to calculate expected durations and critical paths.

In the "Railway Reservation System Development" project, each activity is represented as a node, linked by arrows that symbolize the order of execution. The duration of each activity is assigned based on the expected time estimates, considering the best-case, worst-case, and most likely scenarios. Through the calculation of expected durations and variance, PERT charts provide insights into project timeframes, identify activities that may require additional attention, and highlight critical paths that determine the shortest possible project duration.

PERT charts also introduce the concept of float or slack, which indicates the flexibility of non-critical tasks without impacting the overall project timeline. Activities with zero float are critical and must be closely monitored to avoid delays that might affect the entire project schedule.

PERT Chart:



Conclusion:

Incorporating the PERT chart in the "Railway Reservation System Development" project proves to be a strategic approach to enhance project planning, scheduling, and risk management. By analyzing expected durations, critical paths, and float values, we can identify potential bottlenecks, allocate resources more effectively, and proactively manage deviations from the project timeline. The visualization provided by the PERT chart aids in effective communication among project stakeholders and enables a comprehensive understanding of the project's flow and dependencies. Ultimately, utilizing the PERT technique enhances the project's success by promoting efficient task coordination, mitigating potential delays, and delivering a high-quality Railway Reservation System within the stipulated timeframe.

Lab-4

Aim:

To draw Gantt chart for Railway Reservation System

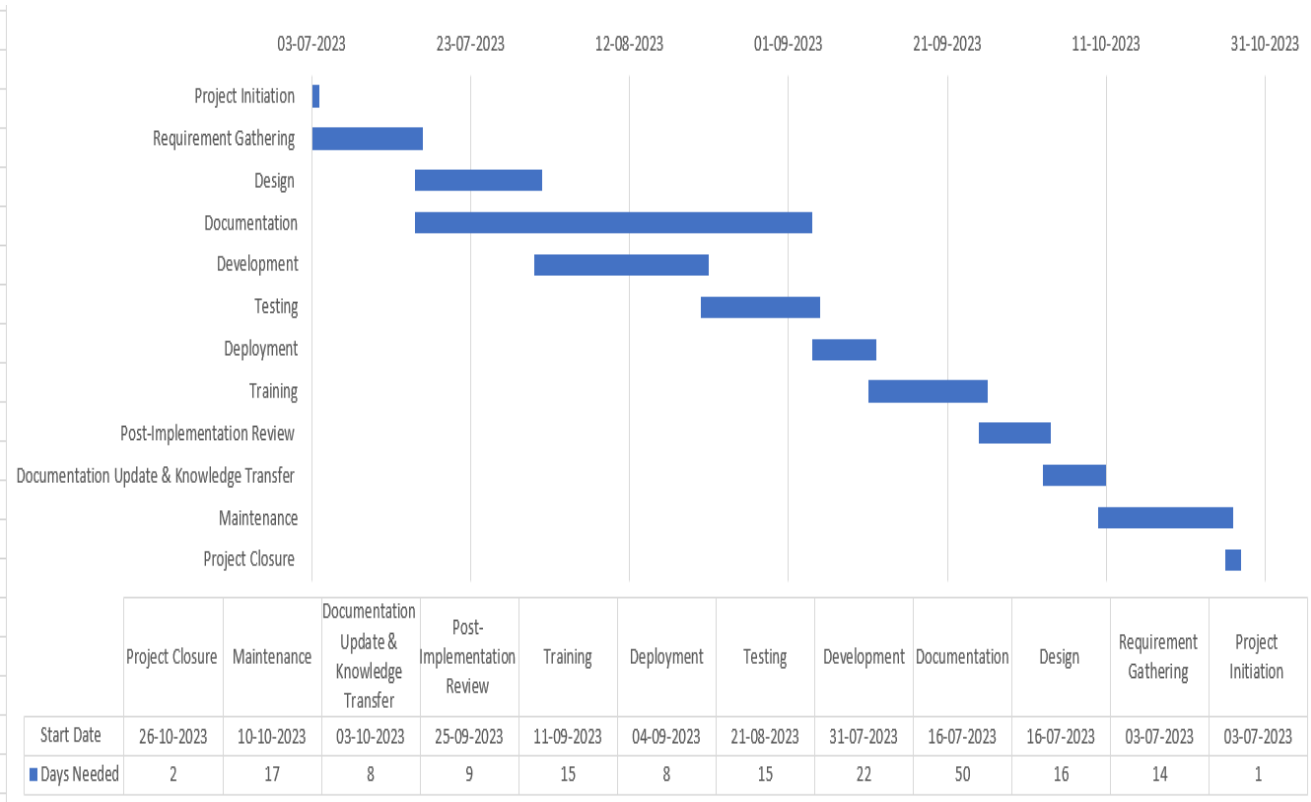
Theory:

The Gantt chart is a widely used project management tool that provides a graphical representation of project tasks and their timelines. Each task is represented as a horizontal bar along a time axis, indicating the task's start and end dates. Gantt charts offer a clear visualization of project scheduling, dependencies, and overall progress.

In the context of the "Railway Reservation System Development" project, the Gantt chart visually depicts the sequence of activities, their durations, and the timeline in which they occur. By aligning tasks along a timeline, project managers and stakeholders can easily understand the project's flow and anticipate potential challenges or bottlenecks. Dependencies between tasks are indicated by the arrangement of bars, ensuring that tasks are executed in the correct order.

Critical paths, representing the sequence of tasks that determine the shortest project duration, can also be identified using the Gantt chart. This allows project managers to focus on tasks that are most critical for timely project completion. Additionally, the Gantt chart enables the allocation of resources by providing a clear overview of when and where resources are needed.

Gantt Chart:



Conclusion:

Utilizing the Gantt chart in the "Railway Reservation System Development" project proves to be a valuable approach for effective project management. By visually representing tasks, durations, and dependencies, the Gantt chart simplifies complex project schedules, fosters communication among team members, and enhances project tracking. The chart's visual nature aids in identifying potential conflicts or delays, enabling timely adjustments to the project plan. Overall, the Gantt chart serves as a dynamic tool that contributes to the successful execution of the project by promoting efficient scheduling, resource allocation, and proactive management of project tasks.

Lab-5

Project Plan: Railway Reservation System

Project Overview:

The Railway Reservation System Development project aims to create a comprehensive and user-friendly reservation system for railway travel. The project will involve the design, development, testing, and deployment of the system, enabling users to seamlessly book tickets and manage their travel plans.

Project Objectives:

1. Develop a web-based railway reservation system that allows users to search for train availability, book tickets, and manage reservations.
2. Enhance user experience by providing an intuitive interface and a streamlined booking process.
3. Implement secure payment gateways for online transactions.
4. Integrate real-time train schedule updates and notifications.
5. Ensure system scalability to handle concurrent user requests during peak times.

Project Scope:

- User Registration and Authentication
- Train Search and Availability
- Booking and Payment Processing
- Reservation Management
- Real-time Train Updates and Notifications

Project Deliverables:

1. Software Requirements Specification (SRS) Document
2. System Design and Architecture Document
3. Frontend and Backend Codebase
4. User Interface (UI) Design Mockups
5. Database Schema and Data Model
6. User Manual and Documentation
7. Test Cases and Test Reports
8. Deployed and Functional Railway Reservation System

Project Timeline:

- Project Duration: 120 days (September to December)

Project Phases:

Phase 1: Initiation and Planning (September)

- Gather project requirements from stakeholders.
- Create a detailed project plan, including tasks, milestones, and resources.
- Define roles and responsibilities within the development team.
- Develop the Software Requirements Specification (SRS) document.

Phase 2: System Design and Development (October)

- Design the system architecture and database schema.
- Develop frontend and backend components based on design specifications.
- Implement user registration, authentication, and train search functionality.

Phase 3: Booking and Payment (November)

- Implement booking and payment processing features.
- Integrate secure payment gateways for online transactions.
- Develop reservation management functionality for users.

Phase 4: Testing and Refinement (November)

- Conduct comprehensive testing, including unit testing, integration testing, and user acceptance testing.
- Address and resolve any identified issues or bugs.
- Refine the user interface and enhance user experience based on feedback.

Phase 5: Deployment and Post-Launch (December)

- Deploy the Railway Reservation System to a production environment.
- Provide user documentation and training materials.
- Launch the system for public use.
- Initiate post-launch support and address any user concerns or issues.

Project Resources:

- Project Manager: [Name]
- Development Team: [List of Team Members and Roles]
- Quality Assurance: [Name]
- User Experience Design: [Name]
- Database Administrator: [Name]
- Technical Support: [Name]

Project Risks and Mitigation:

- Risks: Scope creep, technical challenges, resource constraints.
- Mitigation: Regular project reviews, continuous communication, resource allocation planning.

Project Success Criteria:

- Successful deployment of the Railway Reservation System within the specified timeline.
- High user satisfaction based on usability, performance, and reliability.
- Minimal post-launch issues reported by users.
- Accomplishment of project objectives and deliverables as outlined.

Project Conclusion:

The Railway Reservation System Development project aims to revolutionize railway travel by providing an efficient and user-friendly reservation platform. The project plan outlines the steps, tasks, and resources required to achieve this goal within the defined timeline. Through effective planning, development, testing, and deployment, the project seeks to deliver a robust and reliable reservation system that enhances the travel experience for users.

Lab-6

Aim- To implement Critical path method Activity on Node for Railway Reservation System.

Theory

The Critical Path Method (CPM) is a project management technique used to plan, schedule, and manage complex projects. It is particularly useful for projects with a large number of activities that need to be coordinated to ensure the project is completed on time. CPM helps project managers identify the most critical tasks that can impact the overall project timeline and allows them to focus their efforts on managing those tasks.

1. **Task Identification:** The first step is to identify all the tasks or activities required to complete the project. Each task should have a clear description, a duration estimate, and a list of dependencies (tasks that must be completed before it can start).
2. **Network Diagram:** Once all the tasks are identified, they are arranged in a network diagram, also known as a CPM network or PERT (Program Evaluation and Review Technique) chart. This diagram shows the sequence of tasks and their dependencies.
3. **Duration Estimation:** Each task is assigned a duration estimate, which represents the amount of time required to complete it. These estimates can be based on historical data, expert judgment, or other relevant information.
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5. **Critical Path Identification:** The critical path is the longest sequence of dependent tasks that determines the overall duration of the project. Tasks on the critical path have zero slack or float, meaning any delay in these tasks will directly impact the project's completion date. It's crucial to identify the critical path because it helps project managers focus on the most time-sensitive activities.
6. **Slack Analysis:** Tasks that are not on the critical path may have some slack or float, meaning they can be delayed without affecting the project's overall duration. Project managers can use slack analysis to identify tasks that can be delayed optimizing resource allocation and project scheduling.
7. **Schedule Development:** With the critical path and slack analysis completed, a project schedule is developed. This schedule outlines when each task should start and finish to ensure the project's timely completion.
8. **Monitoring and Control:** Throughout the project, project managers continuously monitor the progress of tasks and compare it to the planned schedule. If any tasks on the critical path are delayed, it may necessitate corrective actions to bring the project back on track.

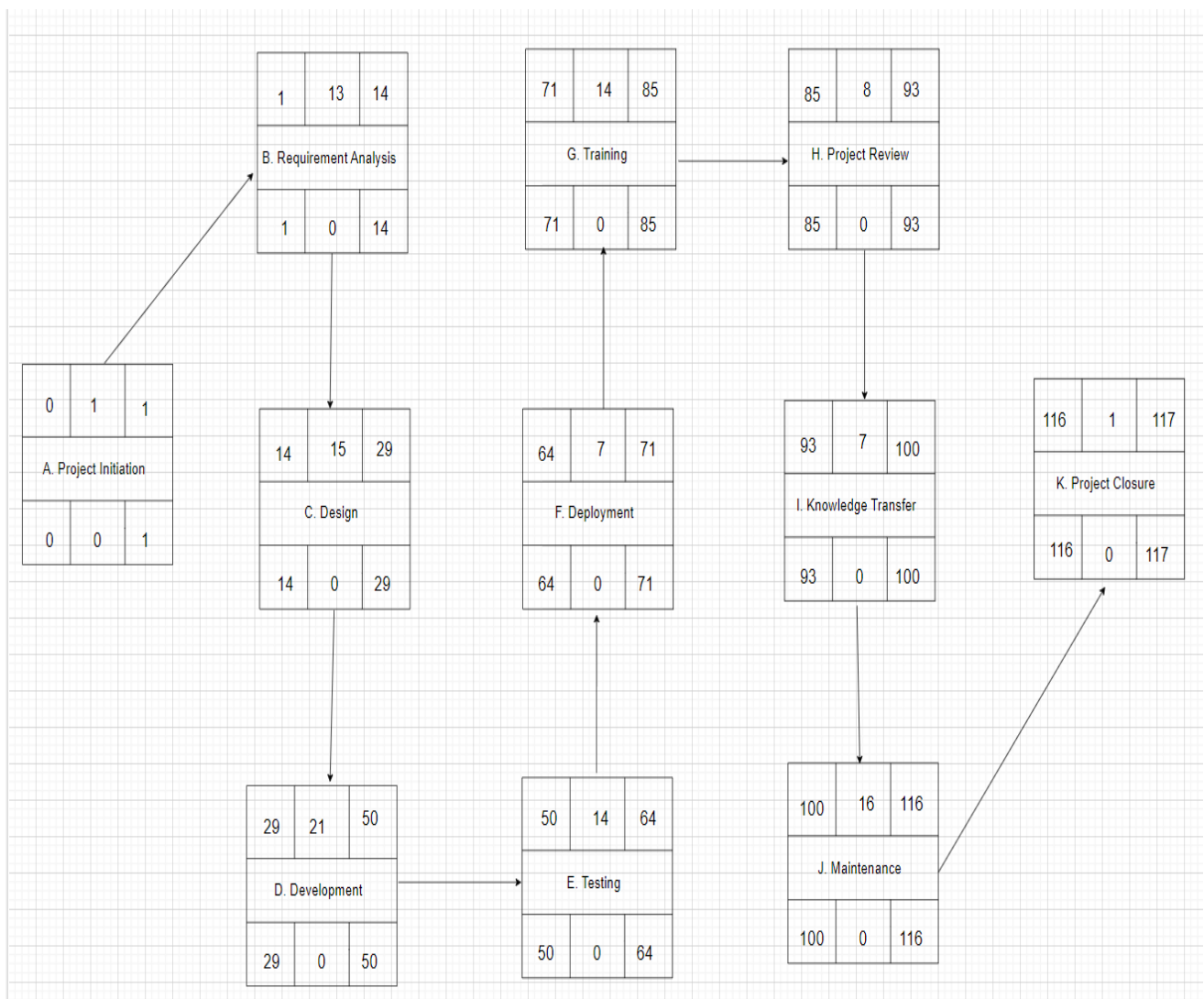


Fig 6.1 CPM Diagram using Activity on Node Method

Critical Path- A, B, C, D, E, F, G, H, I, J, K

Lab-7

Aim- To implement Critical path method Activity on Arrow for Railway Reservation System.

Theory

The Critical Path Method (CPM) is a project management technique used to plan, schedule, and manage complex projects. It is particularly useful for projects with a large number of activities that need to be coordinated to ensure the project is completed on time. CPM helps project managers identify the most critical tasks that can impact the overall project timeline and allows them to focus their efforts on managing those tasks.

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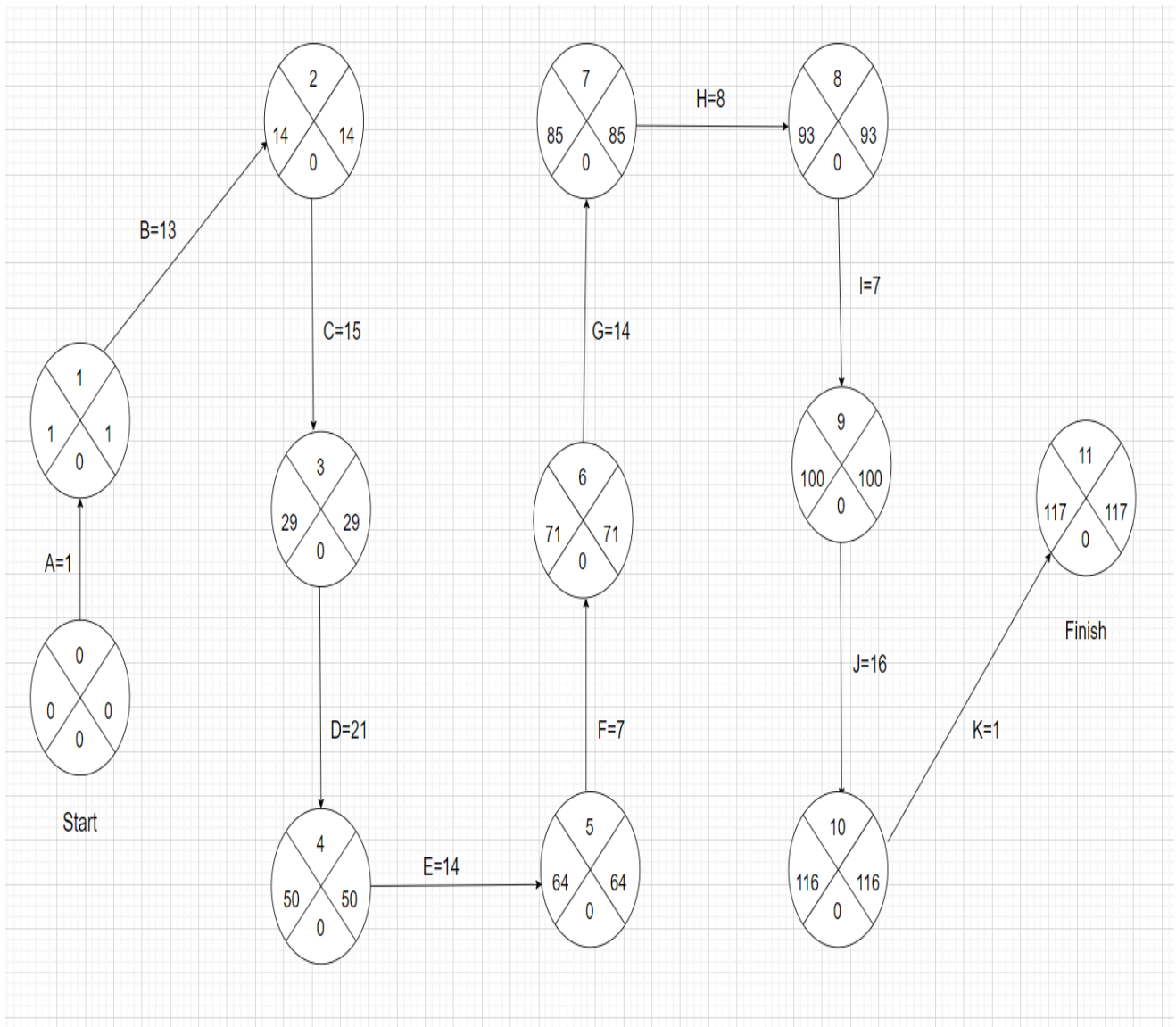


Fig 7.1 CPM Diagram using Activity on Arrow Method

Critical Path- A, B, C, D, E, F, G, H, I, J, K

Lab 8

Aim- To design the workflow diagram for the Railway Reservation System.

A workflow diagram, also known as a workflow chart, is a visual representation of a business process, project, or job in the form of a flowchart. It provides a graphic overview of the process, showing step by step how work is completed from start to finish, and who is responsible for work at each point in the process. Workflow diagrams use standardized symbols and shapes to depict the various tasks and steps needed to complete the process. They are commonly used for project planning, business process mapping, and business process modeling, but can have other applications in industries like manufacturing and engineering.

Workflow diagrams are beneficial to project management because they help team members better understand the task sequences in which they're involved, create better communication between departments, and give teams a firm grasp on what they have to do. Workflow diagrams can also be used to identify and fix weak points within a long-standing process or workflow, and to isolate and repair inefficiencies and eliminate roadblocks.

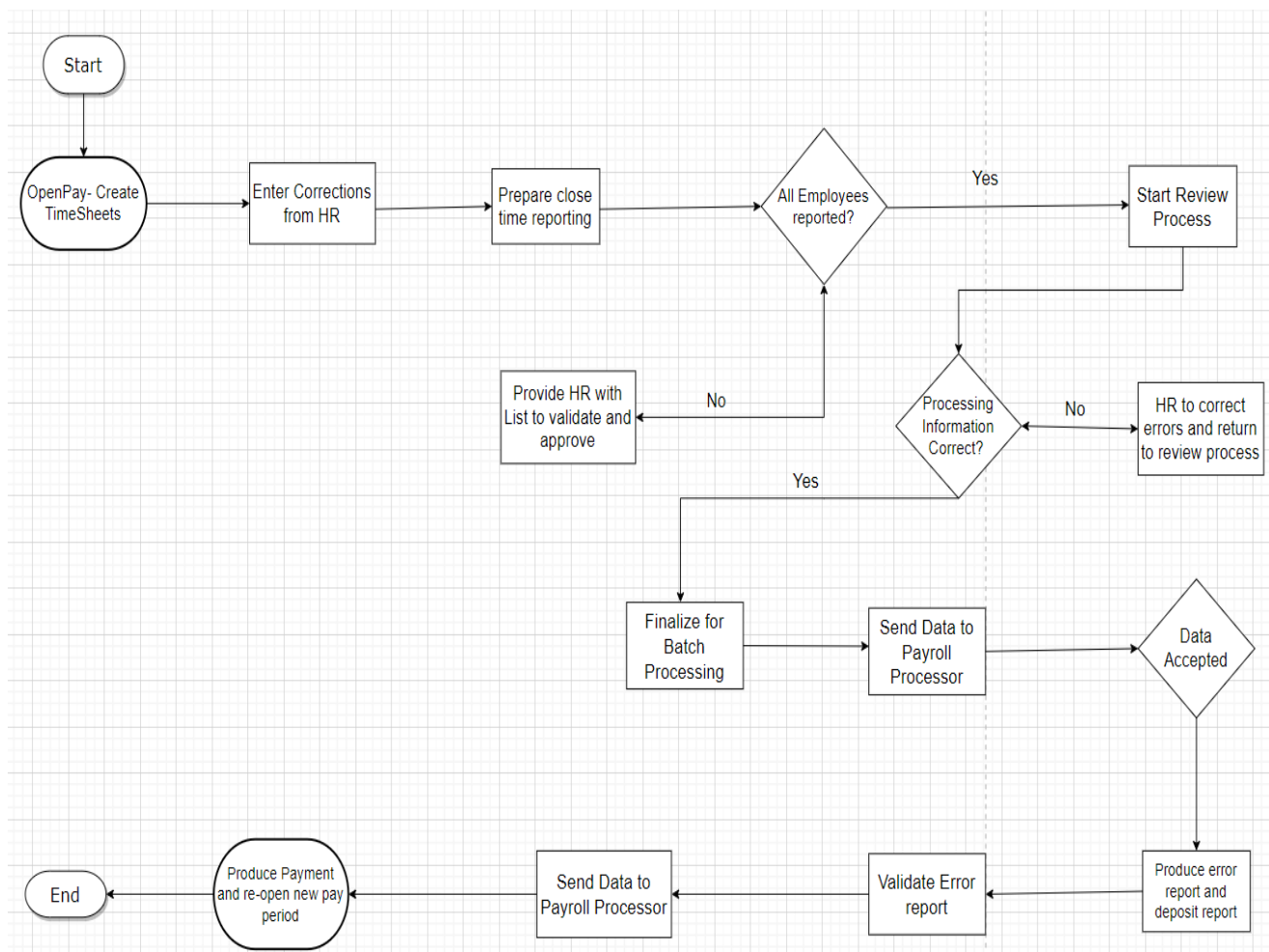


Fig 8.1 Workflow Diagram

Lab 9

Aim- To design Slip chart, Timeline chart and Ball chart for the Railway Reservation System.

Slip chart- is a type of visual progress chart used in project management to show the overall progress of a given project over time. Slip charts are a line graph that plots out tasks, milestones, and events against time, allowing project managers to see which tasks have been completed, if any tasks are slipping behind, or if any tasks are ahead of schedule.

Slip charts are a visual indication of activities that are not progressing to schedule. They are an alternative view of a Gantt chart by providing a visual indication of those activities which are not on schedule. Slip charts are a simple but effective progress report where milestones are plotted on a grid to show when they are scheduled to occur. The more the slip line bends, the greater the variation from the plan.

Additional slip lines can be included at regular intervals, and as they build up, the project manager will gain an idea as to whether the project is improving or not. Slip charts are also used in statistical process control (SPM) to represent how often a process produces parts that fail to meet certain quality standards.

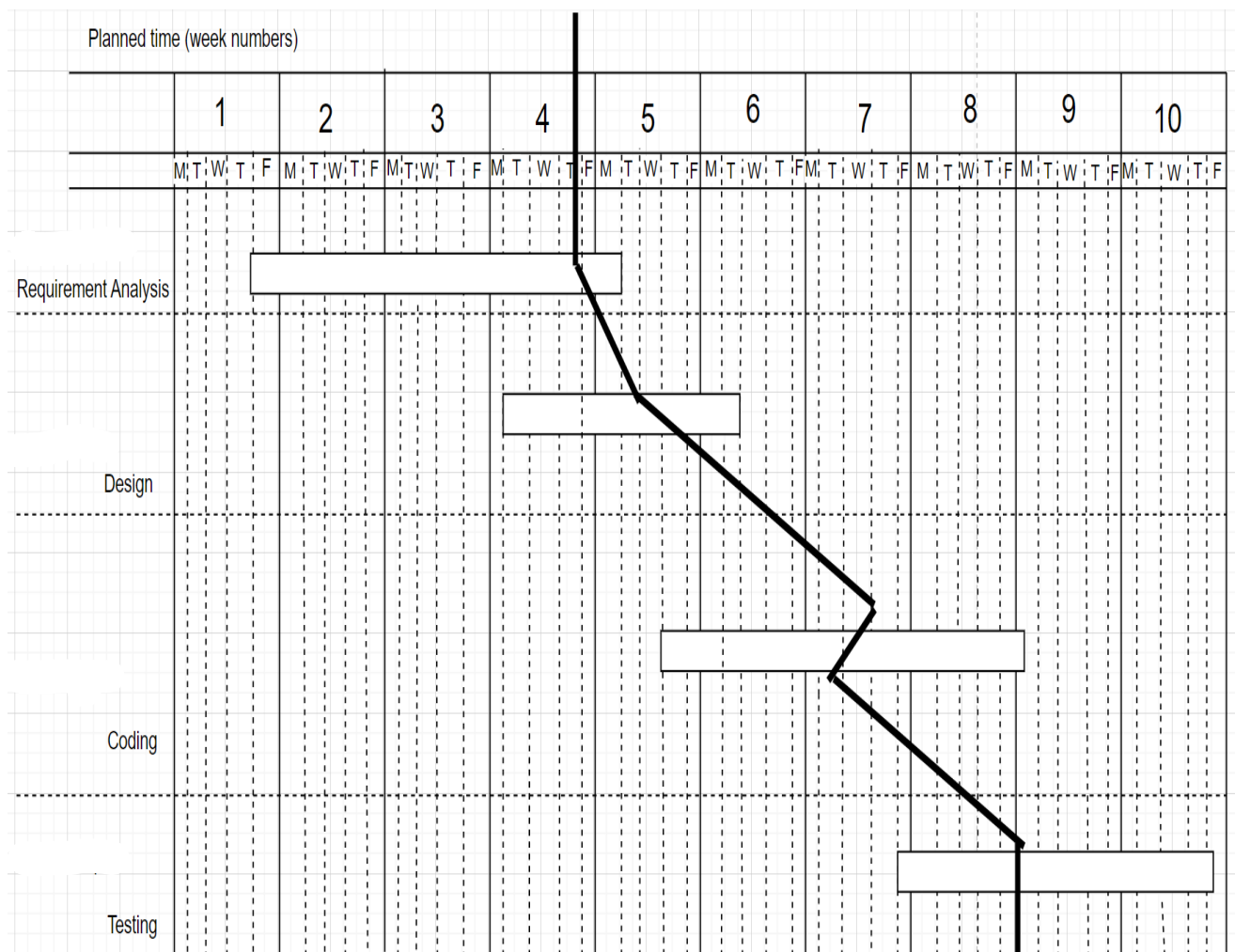


Fig 9.1 Slip Chart for the Railway Reservation System

Timeline chart- is a visual representation of a set of events or processes arranged chronologically. It is a simple yet powerful diagram that can be used to track projects to completion, illustrate historical events, or conceptualize event sequences or processes. Timeline charts typically include dates and descriptions, and some may also include images and headers.

There are several different types of timeline charts available, including event timelines, periodical history timelines, brand historical timelines, and AI growth timelines. Timeline charts are a valuable tool for organizations that need a concise way to visualize a process or event chronologically, and they can help manage complex tasks and ensure they're completed on time.

Some of the benefits of using timeline charts include providing a clear overview of what needs to be done and when, making it easier to allocate resources at the right time, and serving as a decision-making aid for current and future projects.

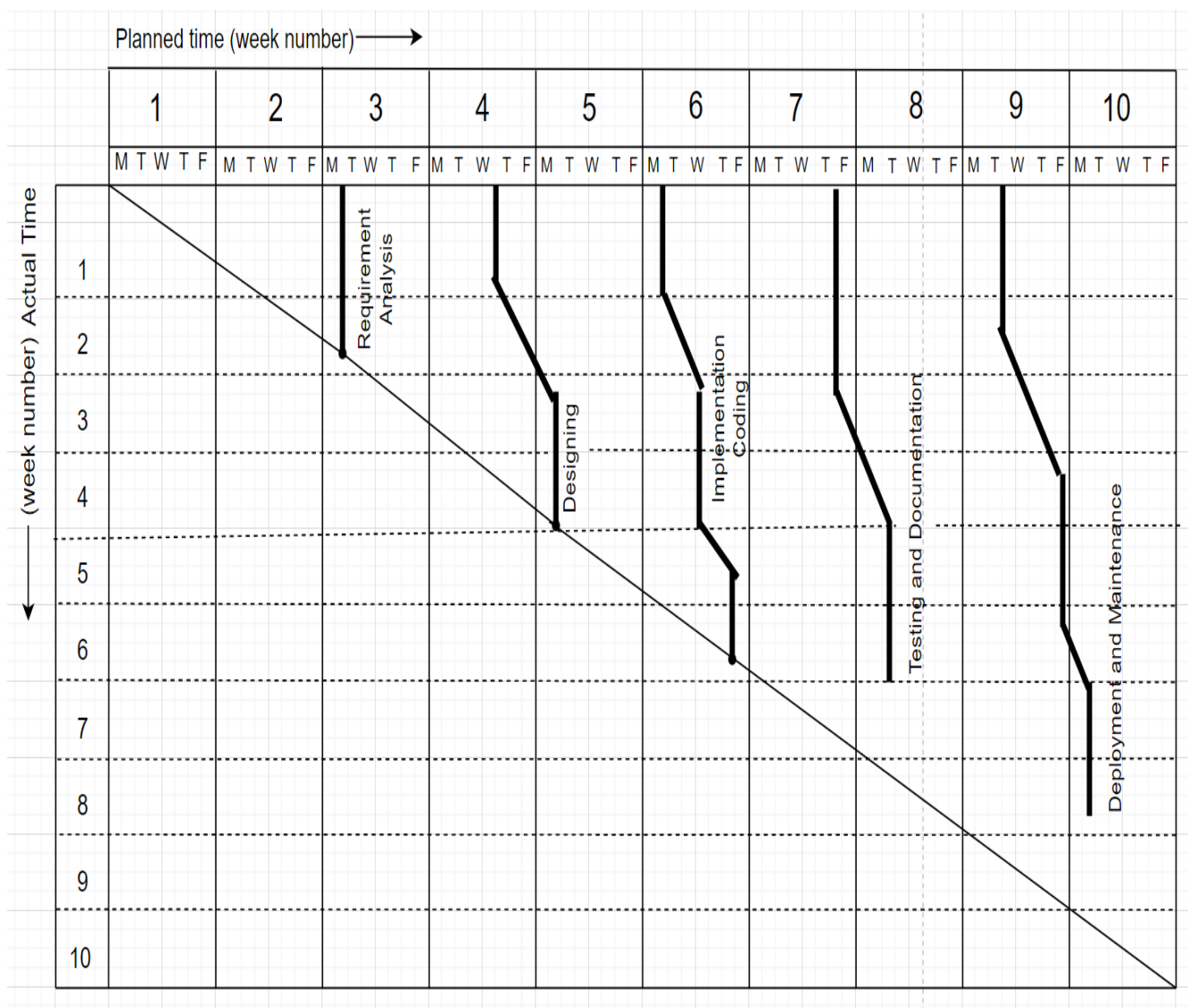


Fig 9.2 Timeline Chart for the Railway Reservation System

Ball chart- also known as a Harvey ball chart, is a type of chart that uses circles to represent data. It is a visual representation of qualitative information such as ease of use, efficiency, safety, taste, or quality. Ball charts circles contain original scheduled dates and the actual dates the activity/event took to complete.

They are also used in project management for project tracking, in lean manufacturing for value-stream mapping and continuous improvement tracking, and in business process modeling software for visualization. In a ball chart, the circles can indicate the start or end of a process, and they can be colored or filled to represent different values or categories. The chart consists of multiple circular shapes, with each colored quadrant representing a certain set of data.

The colored segment usually represents the data or criterion that has been achieved or completed, while the non-colored or blank segment represents the data or criterion to be achieved. Harvey balls are a powerful tool for visualizing different types of data, and they can be used to show different types of data in a single slide or page. However, they may not be the best choice for visualizing large amounts of data, as they can become confusing and difficult to distinguish between each set of data.

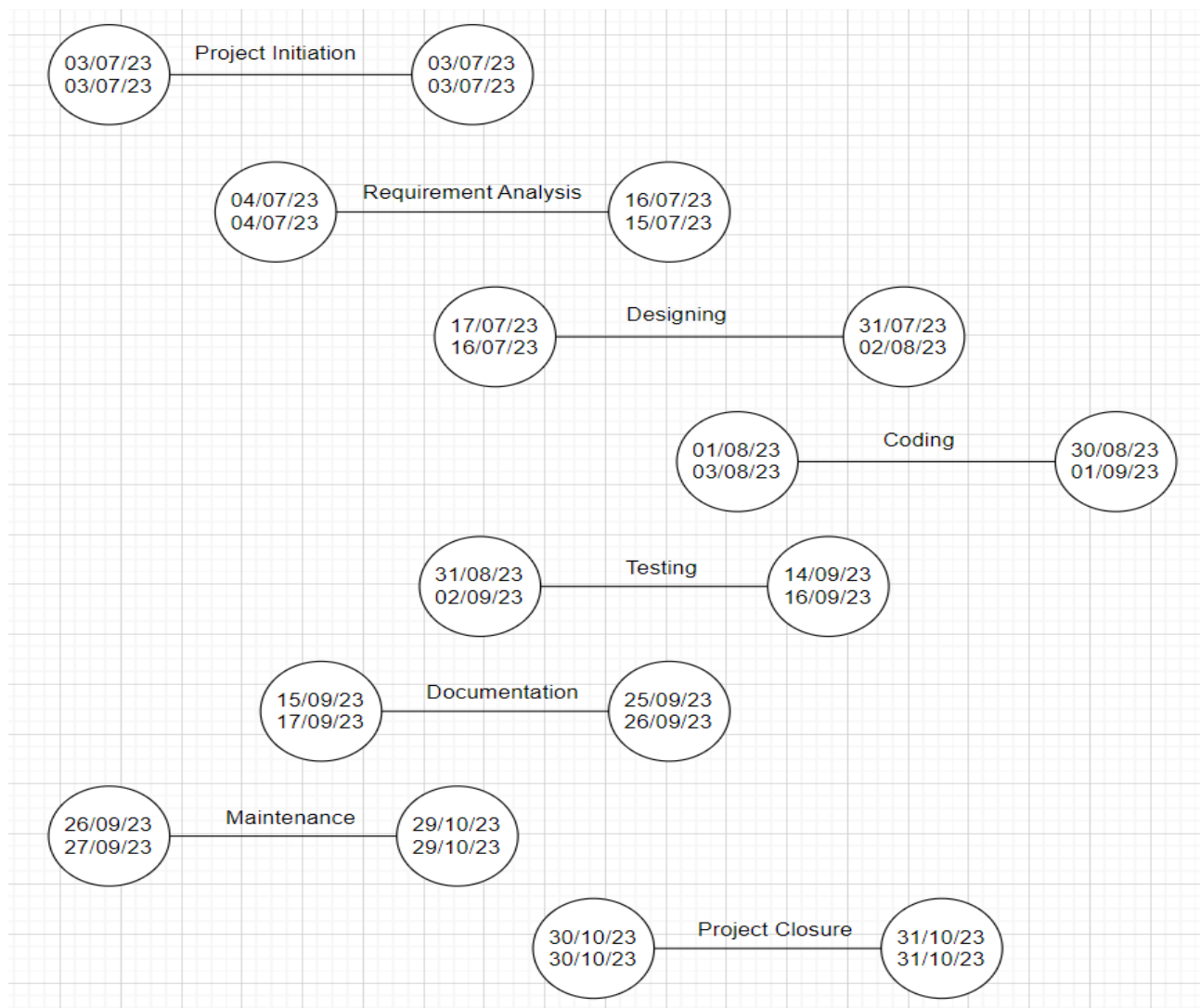


Fig 9.3 Ball Chart for the Railway Reservation System