- Execution
- Monitoring and Controlling
- Closing

- Gantt chart is used by the project manager to describe the interrelation between the activity of the project. It is the tool used by the project manager for any project development. It is more complex if the project has more activities.
- Pert Chart means program evaluation and review technique. It was developed in 1950 by U.S. Navy. It is presented as a network diagram where the nodes represent the events. The direction of the lines indicates the sequence of the task.



15.7 FURTHER READINGS

1. Wixom, B. H., Roth, R. M., (2008), Systems Analysis and Design, Wiley Publishing
2. Kendall, K. E., Kendall J. E., (2019), Systems Analysis and Design, Pearson



15.8 ANSWER TO CHECK YOUR PROGRESS

Ans. Q No 1: Project-task scheduling is a noteworthy project planning action. It comprises deciding which activity would be taken up when.

Ans. Q No 2: Project management is the application of processes, methods, skills, knowledge, and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters.

Ans. Q No 3: To schedule the project, a software project manager always does the following:

a. Identifying the functional requirement of the project.
b. Dividing the large modules into smaller ones or activities.

iii) Collect and estimate the activity resources
iv) Define the activity duration
v) Develop schedule

The activities of a software related project include the following:

i) Initial survey and data collection
ii) Analysis of the collected data
iii) Develop the initial requirement
iv) Develop software upgrading options
v) Create cost estimates
vi) Write report
vii) Professional review and revision

To schedule the project, a software project manager always does the following:

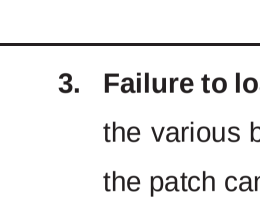
1. Identifying the functional requirement of the project.
2. Dividing the large modules into smaller ones or activities.
3. Defining the dependency among various activities.
4. Defining the time duration required to complete the activities.
5. Allocating resources to activities.
6. Initiating the Plan for beginning and ending dates for the activities.

15.3 REASON FOR SYSTEM FAILURE

A system failure can occur due to the hardware or software failure of the system. The reasons for the system failure are presented below.

1. **Voltage spike or hike:** The voltage spike is a transitory change in the electric power supply. A small power malfunction can smash up a computer and damage computer data. For example: If the computer screen goes blank during a thunderstorm, it may be due to the reason of voltage spike.
2. **Circuit board fails:** A defective circuit board is sometimes supposed to be the reason of circuit board fails. In this case, the board is reinstalled and the operation will resume.

3. **Failure to load software upgrades:** Due to the failure to upgrade the various bugs or vulnerabilities of a computer system, running the patch can software lead to corruption of data.
4. **Failure to keep virus protection up to date:** The malware protection packages available in the computer system must be maintained and updated because a malware-infected computer is slow in the data processing.
5. **Inadequate cooling:** Computers produce more heat, during more data processing. So adequate cooling is essential for reducing the heating.
6. **Loss of PDU fails:** Due to the Power Distribution Units (PDU's) failure, or power loss, sometimes the system may fail.
7. **UPS failure:** Uninterruptible Power Supply (UPS) batteries are used in the computer system for continuous power for a limited time. Depending on the design of the battery, the life span of a battery may vary. High room temperatures will curtail the life of any battery.
8. **Storage defective:** Data is stored on magnetic disks or tape. Both can be damaged during normal operation, so it's a good practice to back up stored data regularly. Failure of a tape or disk drive is often, but not always, proceeded by noise.



CHECK YOUR PROGRESS

Q1: What do you mean by project scheduling tasks?

Q2: What do you mean by project management?

Q3: What are the functionalities of a project manager to schedule a project?

Q4: What are the reasons for system failure?

Q5: What do you mean by storage defective?

15.4 PROJECT MANAGEMENT

Project Management is the process of assisting the project managers in achieving the definite project goals by keeping in mind the



15.6 LET US SUM UP

- Project-task scheduling is a noteworthy project planning action. It comprises deciding which activity would be taken up when.
- The project-related activities are as follows.
  - o Plan schedule management
  - o Defining the workflow diagram, activities, and sequence of activities
  - o Collect and estimate the activity resources
  - o Define the activity duration
  - o Develop schedule
- To schedule the project, a software project manager always does the following:
  - o Identifying the functional requirement of the project.
  - o Dividing the large modules into smaller ones or activities.
  - o Defining the dependency among various activities.
  - o Defining the time duration required to complete the activities.
  - o Allocating resources to activities.
  - o Initiating the Plan for beginning and ending dates for the activities.
- System failure can occur due to the hardware or software failure of the system. The reasons for the system failure are presented below.
  - o Voltage spike or hike
  - o Circuit board fails
  - o Failure to load software upgrades
  - o Failure to keep virus protection up to date
  - o Inadequate cooling
  - o Loss of PDU fails
  - o UPS
  - o Storage defective
- The 5 basic phases in the project management process are
  - o Initiation
  - o Planning

iii) **Pert Chart:** The pert chart means Program evaluation and review technique. It was developed in 1950 by U.S. Navy. It is presented as a network diagram where the nodes represent the events. The direction of the lines indicates the sequence of the task. In the example as shown in figure 15.1 given below, tasks between "Task 1 to Task 9" must complete, and these are known as dependent or serial tasks. Between Task 4 and 5, and Task 4 and 6, nodes are not dependent and can undertake simultaneously. These are known as Parallel or concurrent tasks. Without resource or completion time, the task must complete in the sequence which is considered as event dependency, and these are known as Dummy activity and represented by dotted lines.

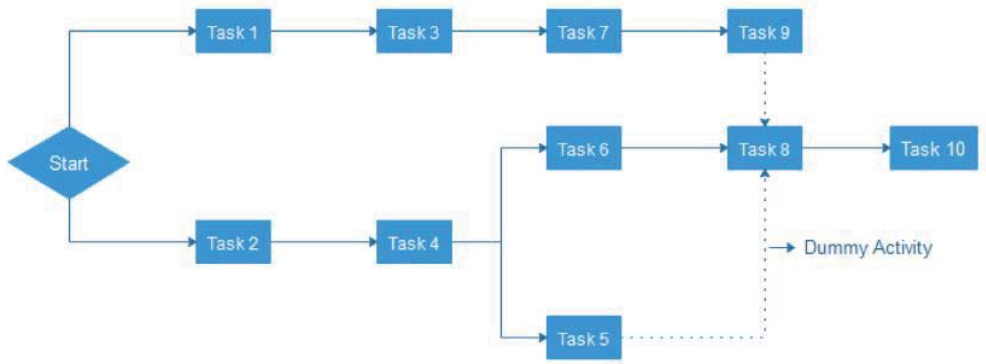


Figure 15.1: Network diagram for 10 tasks



CHECK YOUR PROGRESS

Q6: What are the phases of project execution?

Q7: What is a Gantt chart?

Q8: What do you mean by pert chart?

Q9: What does the direction of a line indicate in the pert chart?

project scope, time, quality, and cost. It is done by carefully organizing, scheming, and executing the project. Managing a project is not an easy task, no matter what the level and range are. From planning to delivering the product to the client, there is a lot that can go wrong. To overcome this issue, the project management processes are divided into manageable stages with their own goals and deliverables. These stages will help to control the project and the quality of the output. The 5 basic phases in the project management process are discussed in the following:

i) **Initiation:** The project initiation is the first phase of project management. Here, the project goal is defined. The Business cases are defined with the help of the project charter. It is an important document consisting of project constraints, goals, appointment of the project manager, budget, expected timeline, etc. Once you have the project goals and project scope, list down the project stakeholders along with their designation and requirement.

ii) **Planning:** After defining the scope of the project, the project is planned along with the budget baseline. The primary tasks are defined to identify the technical requirement of the project with a detailed schedule. The proper goal and objectives, the communication plan, and the role and responsibilities of the stakeholders are defined in this stage.

iii) **Execution:** Here the project resources are allocated to execute the project. The resources are well maintained to execute the project. Here, the project development team will do the actual work by maintaining collaboration between the stakeholders. Sometimes, the project manager takes the help of project collaboration and management tools to execute the project efficiently.

iv) **Monitoring and Controlling:** The project monitoring and controlling run simultaneously. The following steps are carried in this stage of project management.

   i) Track the effort and cost of the projects.
   ii) Monitor the project progress.
   iii) Prevent any chance of disruptions.

v) **Closing:** This is the final phase of the project management process. It indicates the end of the project after the final delivery. The external resources or talents which are hired for the project are terminated. Sometimes, the project manager organizes the reflection meeting after the completion of the project to contemplate their successes and failures during the project. A detailed report which covers every aspect of the project will be prepared and delivered.

15.5 PROJECT PLANNING TOOLS

The project management tool is very much important to execute a project successfully. To execute a project, few tools are specially designed for project management work. These tools help the project manager to work in a standardized manner. Few tools are demonstrated here only.

i) **Milestone checklist:** This tool is used by the project manager to check the project progress in terms of its correctness. A project manager can create a milestone checklist with the help of a simple excel sheet without having any expensive software.

ii) **Gantt chart:** It is a chart used by the project manager to describe the interrelation between the activity of the project. It is the tool used by the project manager for any project development. It is more complex if the project has more activities. A project Gantt chart may be created in an excel sheet also. Nowadays many online Gantt chart editors are there to create a Gantt chart. Let's take an example with the following tasks for a project and the Gantt chart of the project is defined as follows.

Sl. No.	Work Plan	Staring Month	Ending Month	Estimated months for each Task
Task 1	Detailed background study along with field study	0	9	9
Task 2	Purchase of required equipment and setting up the recording requirement	2	4	2
Task 3	Data Collection and building of corpora	1	12	11
Task 4	Feature extraction process for ML	8	12	4
Task 5	Training and testing phase for ML	13	15	2
Task 6	Implementation DL Model	13	20	7
Task 7	Development of software Tool and digital preservation of traditional method	12	26	14
Task 8	Loading and testing of ML and DL Model into the developed system	23	29	6
Task 9	Implementation and Further improvement	28	33	5
Task 10	Preparation of the report and Plan for Post Project Activities	34	36	2

