

Module 5

- 1- Activity networks are a helpful tool for project scheduling because they allow for critical path analysis, visual representation of the project schedule, and flexibility in project scheduling. They make it possible for team members to identify the most important tasks, comprehend the project's flow, and adjust to changes in the project's scope, resources, and timeline. Activity networks are a common instrument for efficient project planning and execution because of these benefits.
- 2- The longest chain of interdependent tasks that affects a project's finish date is known as the critical path. Understanding the critical path is crucial because any delay in finishing a task on the critical path will cause the project as a whole to be delayed. Therefore, it is essential to keep an eye on the development of tasks that are on the critical route and make sure they are finished on schedule. Project managers can make sure the project is finished on time and within budget by managing the critical path successfully.
- 3- Identifying the critical path and estimating project duration are two aspects of the Critical Path Method (CPM), a project management method. It includes drawing a network diagram, finding the critical path, and identifying activities, dependencies, and duration. Project managers can allocate resources, monitor development, and spot obstacles by identifying important tasks.
- 4- When the duration of individual tasks is unknown, project managers can use the Program Evaluation and Review Technique (PERT) to estimate the project's overall duration. It entails finding all tasks necessary to finish the project, figuring out how they are related,

and estimating how long they will take using three time estimates: optimistic, pessimistic, and most likely. PERT uses statistical techniques to determine the likelihood that a project will be completed within a specified period as well as its anticipated duration.

- 5- In project management, there are two techniques for building activity networks: AOA and AON. While AON depicts activities as nodes and dependencies as arrows, AOA represents activities as arrows and nodes as events. Dummy actions are added to AOA as arrows, whereas they are added to AON as nodes. The complexity of the project and the project manager's tastes will determine whether to use AOA or AON.
- 6- Crashing is a technique for shortening the critical path, which includes adding resources to the activities on the critical path. This is frequently accomplished by hastening the completion of a job by adding more personnel, tools, or supplies. This approach may be successful, but it can also raise project expenses and isn't always practical due to resource limitations. "Fast-tracking" is a different strategy for shortening the critical path. This includes overlapping tasks that are usually carried out in a particular order to reduce the length of the critical path overall. Fast-tracking can shorten project length, but it also increases project risk by posing the possibility of task conflicts.
- 7- A bar chart known as a Gantt chart is used to show how a project's tasks and actions are scheduled over time. The clear visualization of the project's timeline, simple contact with team members and stakeholders, detection of possible conflicts and delays, and effective resource allocation are all advantages of using Gantt charts for project management.
- 8- A project can be "crashed" using a project management strategy that involves increasing the amount of resources or changing the work schedule. Using this method, crucial tasks are completed more quickly in order to finish the job sooner or meet a deadline. Meeting

a deadline, such as one set by a contract or a market opportunity, is one reason for crashing a project. Project managers can shorten the timeline and finish the project by adding more resources or changing the plan. Crashing an undertaking can also be done to cut costs or better allocate resources. Project managers can save money by using fewer resources or shifting them to other projects if they shorten the project's length. Crashing a project also encourages team members to concentrate on important duties and avoid pointless delays, which helps the project run more efficiently overall.

- 9- Adding resources and decreasing the project's scope are two methods for crashing a project. While reducing the project scope entails eliminating or delaying non-essential tasks to reduce the project duration, adding resources entails expanding the workforce or equipment to shorten the crucial path. Both methods should be carefully considered before use because they each have benefits and drawbacks.