

Summary

- A project is an endeavour to create a unique product or service. It is specific, timely, usually multi-disciplinary and always conflict-ridden. A project defines a combination of interrelated activities that must be executed in a certain order before the entire task can be completed. An activity in a project is usually viewed as a job requiring time and resources for its completion. Projects are a part of an overall programme and are broken down into well-defined set of tasks (jobs), subtasks and further if desired, all of which must be completed within a specified time, along with a minimum cost
- The main objective before starting any project is to schedule the required activities in an efficient manner so as to complete it on or before a specified time limit at a minimum cost of its completion. Hence, before starting any project it is necessary to prepare a plan for scheduling and controlling the various activities (or tasks) involved in the given project. This will help in undertaking the project, possibly identifying bottlenecks and even discovering alternate work-plan for the project
- One of the most challenging jobs that any manager can take on is the management of a large-scale project that requires coordinating numerous activities throughout the organization. A myriad of details must be considered in planning how to coordinate all these activities, in developing a realistic schedule, and then in monitoring the progress of the project
- The techniques of operations research used for planning, scheduling and controlling large and complex projects are often referred as to network analysis, network planning or network planning and scheduling techniques
- All these techniques are based on the representation of the project as a network of activities. A network is a graphical plan consisting of a certain configuration of arrows and nodes for showing the logical sequence of various activities to be performed to achieve project objectives
- Project management has evolved as a field with the development of two analytical techniques for planning, scheduling, and controlling of projects. Fortunately, two closely related operations research techniques, PERT (program evaluation and review technique) and CPM (critical path method), are available to assist the project manager in carrying out these responsibilities
- These techniques make heavy use of networks to help plan and display the coordination of all the activities. They also normally use a software package to deal with all the data needed to develop schedule information and then to monitor the progress of the project
- The project evaluation and review technique (PERT) and the critical path method (CPM) techniques were developed by two groups almost simultaneously
 - **CPM** was developed by E. I. Du Pont de Nemours & Company as an application to construction projects and was later extended to a more advanced status by Mauchly Associates
 - **PERT** was developed by the U.S. Navy by a consulting firm for scheduling the research and development activities for the Polaris missile program

- PERT and CPM were independently developed in the late 1950s. Ever since, they have been among the most widely used OR techniques. However, they also had a great deal in common, and the two techniques have gradually merged further over the years
- In fact, today's software packages often include all the important options from both original versions. Project management software, such as MS Project, now is widely available for these purposes
- Consequently, practitioners now commonly use the two names interchangeably, or combine them into the single acronym PERT/CPM, as we often will do. We will make the distinction between them only when we are describing an option that was unique to one of the original versions
- Although PERT and CPM were developed independently, they are similar in principle. Today, PERT and CPM actually comprise one technique and the differences, if any, are only historical. Consequently, both techniques are referred to as "project scheduling" techniques and play an important role
- In general Project management by PERT-CPM consists of three basic phases:
 - Planning
 - Scheduling
 - Controlling

The relationship among the phases of project management indicates how the actual task performance data is used to track deviations from the original plan and schedule
- These adjustments are helpful to aggregate work packages into subsystems and track the progress of these subsystems as part of the reporting and review procedures. In this way, it is less likely that a project manager will lose sight of the forest because of too many trees