Key Tool - Critical Path Method

A project manager's main goal is to successfully complete a project. To accomplish the goal, a project manager must address various aspects of the project, including resources, people skills, budgets, and different expectations. A project manager can use different tools and techniques to plan a project with all aspects in mind successfully. One such technique is the **critical path method**.

Several activities or tasks in a project together form the longest sequence that a project team must complete on time to ensure the successful completion of the project. The longest sequence is referred to as the critical path. A delay in any activity in the critical path can result in an overall delay in the project.

Using the critical path method, the project manager can determine the potential early start and early finish days and the potential late start and late finish days for a project. In this method, a project manager creates a visual of the different activities or tasks in the project. The project manager aims to determine the longest sequence of tasks along with the latest finish day. Here is an illustration of a completed Critical Path analysis.

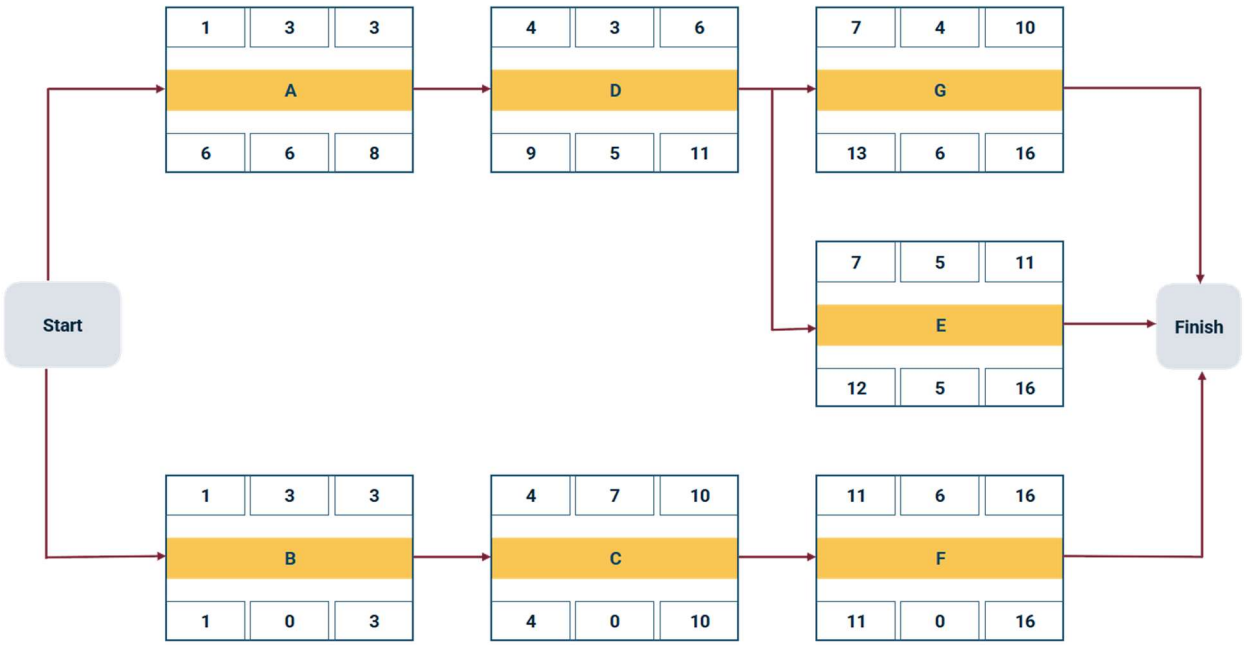
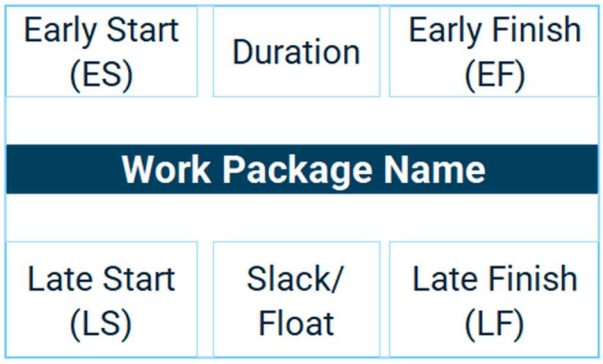


Figure 1 Project Network Diagram

Key Terms Associated with Critical Path Method

The critical path method uses the following symbol to calculate a critical path for a project.



Let's look at the definitions for each of the terms.

- **Early Start (ES)**: The earliest time that a task can be started in the project. Make sure to understand the dependencies before adding this time.
- **Late Start (LS)**: The very last minute in which the project manager can start a task before it threatens to delay the project schedule.
- **Early Finish (EF)**: The earliest time when a task can be finished, depending on the duration and the earliest time when the task can start.
- **Late Finish (LF)**: The latest time when a task can be completed, based on its duration and its latest start time.
- **Slack/Float**: A term that describes how long the project task can be delayed before it impacts other activities in the sequence and the project schedule. Note that any task on the critical path will have zero float because the task cannot be delayed.

Benefits of using the critical path method

- The critical path method allows the project manager to determine work packages on the critical path. A project manager must manage these packages carefully. Any schedule slip on any critical path work package will result in a project schedule slip.
- Work packages on non-critical paths have built-in flexibility. If hard-pressed, we can delay completion or borrow or "crash" resources from the non-critical path to keep the critical path on schedule.
- Be careful when you crash. If you use too much slack or float, the non-critical path may become a new critical one.