

Resource Allocation

1. An activity is a task or set of tasks that use resources and time to complete a project. An event is the result of completing activities that use no resources. A path is a series of connected activities, or intermediate events between two events in a network. A dummy activity is a hypothetical activity that requires no resources or time to complete.
2. The characteristic of a critical path that makes it critical is the time and cost trade-offs related to it. It uses time and cost estimates to either expedite or delay parts of a projects. It depends on whether the time and costs associated will benefit the project or hinder it. The critical path method is useful for saving time and resources for more important tasks.
3. A Gantt Chart compares a project's performance against the original schedule, plan, and cost estimates. It helps indicate current status and helps us expedite, sequence, and reallocate resources. The contain special symbols to highlight areas of concern. It differs from the WBS Model because the work breakdown structure is intended more for breaking down tasks into subtasks to improve efficiency and productivity. The Gantt Chart is focused more on visualizing progress.
4. Total slack and free slack differ from each other. Total slack is how much time a task can be delayed before it affects the completion date and free slack is how much time a task can be delayed before it affects the next task. Total slack can be positive or negative and free slack is the difference between the next task's start date and the current task's end date.
5. There are several scheduling techniques that are appropriate to use when deciding which way is the best. The Program Evaluation and Review Technique, or PERT, is used when a project is extremely complex and scheduling needs to be as accurate as possible. It's used in the initial planning phase and projects the timeline in the beginning parts of the project. The CPM technique is appropriate when evaluating time and cost trade-offs. Lastly, Gantt charts are appropriate when we need to reallocate resources to ensure successful completion in the projected timeframe given.
6. There is a difference between activity-on-node and activity-on-arrow. On a PERT network, activities are shown as arrows, and this is called activity-on-arrow. In a CPM network, the activities are shown as nodes, and this is referred to an activity-on-node. An AOA refers to activities and their sequencing, while AON refers to the relationships between activities.

7. Simulation determines the probabilities of various project completion times by mathematically using individual values that are chosen randomly for each variable in the model. We use probability distributions, and the outcome of model is calculated. The process is then repeated, and a statistical distribution model shows all of the outcomes. We are then able to see the risk profile of a decision.
8. A network is drawn by identifying all activities, estimating the duration of each activity, sequencing them, drawing the diagram and then updating it accordingly. We use straight arrows for directional purposes, nodes to start or end an activity, and remember to only show the most important information.
9. Late start time is the latest time a task can begin without delaying the overall timeline. Early start time is the earliest a task can begin and early finish time is the earliest a task can be completed. It's important to manage our time correctly to ensure the project timeline stays on schedule.
10. The critical path is determined by using the CPM technique. It's important to identify tasks, determine sequences and durations of tasks, and creating a network diagram. It evaluates costs associated with scheduling.
11. Slack is the difference between the late start and early start. It's important because it helps improve task management efficiency and project managers manage their teams. It helps us set realistic deadlines, provides positive project planning, and it helps us allocate and reallocate resources accordingly.

Scheduling Projects

1. Several resources may need to be considered when scheduling projects. These include project activities, dependencies, sequence activities, durations, budget, human resources, finances, and risk management.
2. Resource loading is the number of resources of each kind that are for a specific activity in a specific time period. Resource levelling helps even out the peaks and valleys of the required resources. This helps a fixed number of resources to be employed over time. The difference is that resource levelling focuses on timelines, budgets and allocating resources evenly across tasks and activities, while resource loading is focused on maximizing productivity.
3. An activity slope is the ratio of increasing costs for expediting the decreased amount of time for an activity. It evaluates critical activities that can be shortened to minimize direct costs of the project. It indicates the cost increase that occurs when the production of an activity is reduced by one day.
4. Four priority rules are as soon as possible, as late as possible, shortest tasks first, and minimum slack first. The minimum slack first rule is best because it rarely causes bad

performance. A firm decides which priority rule to use by creating a list and defining criteria such as ROI, user satisfaction, risk, and resource availability. We can then rank tasks and determine which ones are our highest priorities.

5. Three efficiency criteria that might be considered when choosing a multiproject scheduling system are schedule slippage, resource utilization, and level of in-process inventory.
6. The two methods that are used for addressing the constrained resource allocation problem are resource levelling and resource smoothing.
7. The task life cycle type affects our attempts to level the resource loads by helping us determine which tasks should be completed before other can begin. It helps us decide where to allocate resources gives us scheduling flexibility.
8. The critical chain is a method that focuses on resources, rather than the tasks by themselves. It helps us evaluate resource allocation to ensure successful completion of each task.