Course Learning Outcomes for Unit V

Upon completion of this unit, students should be able to:

1. Implement a basic project schedule.
   1.1 Schedule project activities based on a project budget and time constraints.

2. Define project management as a series of activities and tasks.
   2.1 Recall scheduling reporting methods.
   2.2 Identify the precedence diagram methods.
   2.3 Define schedule compression methods.

3. Explain how the project triple constraint is used to manage a project.
   3.1 Describe inputs to building schedule development.

Course/Unit Learning Outcomes	Learning Activity
1.1	Unit Lesson *Project Management in Practice:* Chapter 5 *Project Management: Absolute Beginner's Guide:* Chapter 8 Unit V Project
2.1	Unit Lesson *Project Management in Practice:* Chapter 5 *Project Management: Absolute Beginner's Guide:* Chapter 8 Unit V Assessment
2.2	Unit Lesson *Project Management in Practice:* Chapter 5 *Project Management: Absolute Beginner's Guide:* Chapter 8 Unit V Assessment
2.3	Unit Lesson *Project Management in Practice:* Chapter 5 *Project Management: Absolute Beginner's Guide:* Chapter 8 Unit V Assessment
3.1	Unit Lesson *Project Management in Practice:* Chapter 5 *Project Management: Absolute Beginner's Guide:* Chapter 8 Unit V Assessment

Reading Assignment

Project Management in Practice

Chapter 5: Scheduling the Project

Project Management: Absolute Beginner's Guide

Chapter 8: Developing the Project Schedule

Unit Lesson

Project Scheduling

Previously, we focused on the project budget. In this unit, our focus is on the project schedule, which is one of the most important tasks in project management. Although the schedule is very important, most project managers find it difficult to develop a good schedule due to the following reasons:

- lack of enough time for the project manager and his/her team to conduct detailed and proper planning,
- lack of knowledge or education on schedule management processes and techniques,
- lack of understanding with some of the scheduling software applications such as Microsoft Project, and
- an assumption that detailed scheduled planning is unnecessary.

As you may remember, time is one of the triple constraints and is a special interest for the senior leadership in your organization. When developing your project schedule, you must consider the following to create an effective schedule:

- All the schedule estimates should be based on all the activities in the work breakdown structure (WBS).
- Estimate for each activity in the WBS should be given by the person on the team assigned to that activity rather than by the project manager.
- Consider similar historical activity estimates and their durations and apply those to current estimates.
- Track project progress using schedule baseline processes and only change the progress through formal change control.
- Use the organization's integrated change control for all changes affecting time.
- Padding of schedule time should not be allowed and must be discouraged—accuracy should be the driver for estimations.
- Estimates should be realistic with due consideration on the resources and complexity of tasks.

Developing a project schedule is a relatively complex, interactive process. It consists of analyzing activity sequence, dependency, durations, and resources (materials, manpower, equipment, supplies, etc.) to ensure that all these elements align together to achieve the project schedule objectives (Meredith, Shafer, & Mantel, 2017).

When developing the project schedule, there are certain inputs or considerations that the project must consider, such as:

- *Schedule management plan:* This plan contains the details on the schedule management guidelines, policies, procedures, methods, and tools that may be used to develop the schedule.
- *Activity attributes:* Detailed information about the activities that will be helpful in scheduling the activities
- *Project schedule network diagrams:* These diagrams show the logical relationship, dependency, and order of activities that will be essential for assigning dates to each activity.
- *Activity resource requirement:* Information on resources (materials, manpower, equipment, supplies, etc.) and requirements are essential to developing the schedule.
- *Resource calendars:* Calendars show the resource usage across the organization and has information on resource availability and constraints useful in developing the project schedule.
- *Activity duration estimates:* Information on how long the activity will take to complete is essential for schedule development.
- *Project scope statement:* This document contains information on assumptions and constraints that are extremely helpful in schedule development.
- *Risk register:* Contains a list of identified risks and their probability, impact, priority, and response plan. The project schedule may be impacted by these various risk events in the project (Horine, 2017).

Just as we have inputs that must be considered in developing the project schedule, we also have tools and techniques to help us ensure that the schedule created will actually work. Some of these tools and techniques are as follows:

Critical path method: Critical path is the longest uncompressible path through the project network diagram. It means that the critical path determines the shortest time it will take to complete the project activities. The critical path is important because it determines which activities on the network can be delayed without ultimately delaying the project. The implication is that all the activities on the critical path cannot slip and cannot be padded.

- *Lead and lag: Lead* is the process of performing a successor activity before the predecessor activity, for example, coding the software before doing requirement analysis. *Lag*, on the other hand, is a deliberate imposition of delay or waiting period between activities. For example, waiting five days after the foundation before laying the bricks.
- *Schedule compression:* This is the process of shortening the project schedule without changing the project scope or sacrificing desired quality. Two main techniques used in schedule compression are fast-tracking and crashing.
    - *Fast-tracking* is the technique of doing critical path activities in parallel when they were originally planned in series. Usually it results in rework, increase risks, and requires more communication. Most of the time, it will not increase cost, but it will increase risk to the project since discretionary dependencies will be ignored to perform activities simultaneously.
    - *Crashing* is the technique of adding additional resources to complete a project activity quickly. For example, your project is two months behind schedule, so you bring in more staff to help do the work—crashing. The implication is increased cost.

Now that we have the inputs and tools, we can now create the project schedule. The project schedule is the result of schedule network analysis and includes a planned start date and planned end date for each activity. It can be presented in a summary form or as a detailed presentation, and it is typically represented graphically. There can be several schedule formats:

- *Bar charts/Gantt charts: A bar chart is a time-phased graphical display of activity start dates, end dates, and durations. It is also referred to as a Gantt chart because*
    - *it is useful for tracking the progress and reporting it to the team,*
    - *it is relatively easy to understand and may be used in management presentation, and*
    - *it can be easily modified to show the percentage of completed work (Horine, 2017).*

- *Network diagram: A network diagram is a schematic display of the sequential and logical relationships of the activities that comprise a project. The network diagram shows dependencies and the order in which activities in a project must be performed. The network diagram can be beneficial because*
    - it shows the interdependences of all activities,
    - it shows the order in which activities will be performed,
    - it shows workflow so that sequence is known,
    - it is used for schedule control and reporting to show project progress, and
    - it helps justify time estimates (Horine, 2017).

- *Milestone chart: This chart is similar to a bar chart but only shows major events. It is not beneficial because*
    - the charts have no duration (i.e., they are simply the completion of activities), and
    - the presentations have too much detail that may be undesirable and distracting to higher management (Horine, 2017).

References

Horine, G. M. (2017). *Project management: Absolute beginner's guide* (4th ed.). Indianapolis, IN: Pearson

Meredith, J. R., Shafer, S. M., & Mantel, S. J., Jr. (2017). *Project management in practice* (6th ed.). Hoboken, NJ: Wiley.

Learning Activities (Nongraded)

Nongraded Learning Activities are provided to aid students in their course of study. You do not have to submit them. If you have questions, contact your instructor for further guidance and information.

Read the “Springville Fire Department” case in the *Project Management in Practice* textbook on page 179. If you were the project manager, which method would you prefer to use, and why?