Microsoft

PMP Rapid Review

Sean Whitaker

Rapid Review

Assess your readiness for the updated PMP Exam—and quickly identify where you need to focus and practice. This practical, streamlined guide walks you through each exam task, providing "need to know" checklists, review questions, tips, and links to further study—all designed to help bolster your preparation.

Reinforce your exam prep with a *Rapid Review* of these objectives:

- Initiating the project
- Planning the project
- Executing the project
- Monitoring and controlling the project
- Closing the project

This book is an ideal complement to the in-depth training of the Microsoft Press *Training Kit* and other exam-prep resources for the PMP Exam aligned with the *Guide to the Project Management Body of Knowledge (PMBOK Guide), Fifth Edition*.

PMP Exam

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$$= \frac{4 + 28 + 12}{6}$$

$$= \frac{44}{6}$$

$$= 7.33$$

In addition to calculating the expected duration, you can also calculate the standard deviation and variance. The standard deviation (SD) is a calculation of how far away from the average duration, or the expected duration using the three-point estimating formula, your data is spread. A smaller SD means that the data is tightly grouped, whereas a larger SD means that the data is more widely spread.

The SD calculation used in the three-point estimating technique is essentially a heuristic, or rule-of-thumb, way of calculating SD rather than the full formula used by statisticians. The formula subtracts the optimistic from the pessimistic, and divides the result by 6. So, using the previous example, the SD is 8 divided by 6, which equals 1.33 days.

$$\text{Standard deviation} = \frac{P - O}{6}$$

A benefit of calculating the SD is that you can then estimate the confidence interval for a range of estimates. The confidence interval states the amount of the data that you expect to fall between the number of SDs above and below the mean. An SD of 1 either side of the mean represents a confidence interval of 68 percent, an SD of 2 either side of the mean gives a confidence interval of 95 percent, and an SD of 3 either side of the mean gives a confidence interval of 99.7 percent.

> ***EXAM TIP*** **An SD of 6 either side of the mean contains 99.999 percent of the population. More commonly known as Six Sigma, it is used as a quality management tool in the project quality management knowledge area.**

Figure 2-15 shows a normal distribution and the range of a population you would expect to find with 1, 2, or 3 SDs either side of the mean.

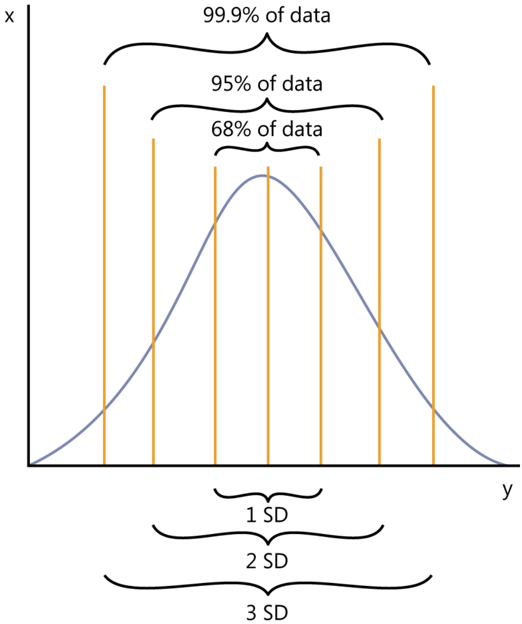

FIGURE 2-15 Standard deviations

True or false? The best estimating technique to use is parametric estimating.

Answer: *False*. The best estimating technique to use is the one that reflects the level of detail available to the project manager. If you are in early stages of progressive elaboration, you might find it best to use analogous forms of estimating. If you have a lot of detailed information available about exact units of work, you might find it better to use parametric estimating. Keep in mind that even if a large amount of data might exist, there might be times when the process of reviewing the data and developing exact figures is not a good use of time and resources.

Critical path method

The critical path method focuses on identifying all the paths through a project and, with the aid of a network diagram, determines which of these paths presents the shortest duration and also the least amount of scheduling flexibility, as indicated by the length of slack or float. The path with the shortest duration and the least slack or float through the project represents the path of most risk to the project, hence the name critical path.

There can be many paths through a project, as Figure 2-16 shows.

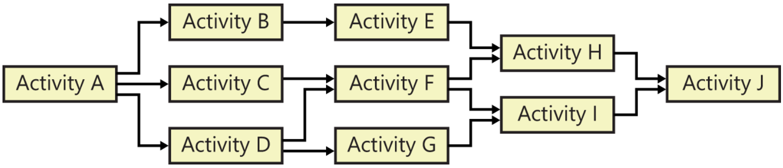

FIGURE 2-16 Network paths

Here are the following paths through this network diagram:

- A-B-E-H-J
- A-C-F-H-J
- A-C-F-I-J
- A-D-F-H-J
- A-D-F-I-J
- A-D-G-I-J

You cannot determine which path or paths are the critical paths until you complete a full schedule network analysis.

To calculate the critical path in an AON diagram, you can use a node to represent the information about the activity. The information contained in the node includes the Task ID, the duration of the activity, the Early Start (ES), the Early Finish (EF), the Late Start (LS), the Late Finish (LF), and the amount of Total Float in the activity. Figure 2-17 represents a node.

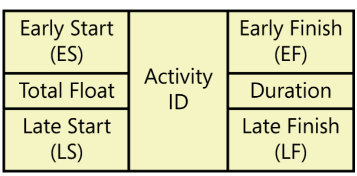

FIGURE 2-17 The activity node

> ***NOTE*** **Be aware that in the real world and in the exam, many different forms of nodes can be used with information displayed differently, yet they all display the same information, just in different ways.**

Now if you take the information contained in Table 2-3 and map it over an entire network diagram, you can calculate the total project duration, and the critical path or paths.

TABLE 2-3 Activity information

ACTIVITY ID	DURATION (DAYS)	PREDECESSOR
A	3	-
B	5	A
C	4	A
D	2	B, C
E	6	C
F	5	D, E
G	4	E
H	7	F, G

The first step in the process is to construct a network diagram showing the relationships between the activities. In this instance, assume that all activities have a FS relationship, and there are no leads and lags. Figure 2-18 shows the network diagram.

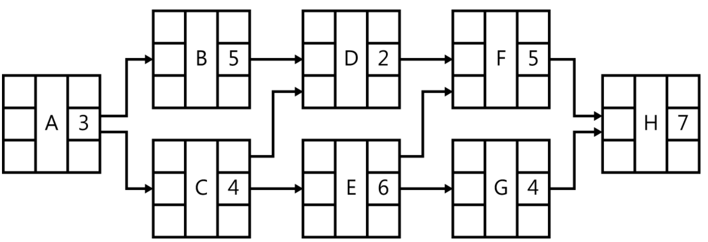

FIGURE 2-18 Network diagram example

By examining this network diagram, you can now write the paths through the diagram as follows:

- A-B-D-F-H
- A-C-D-F-H
- A-C-E-F-H
- A-C-E-G-H

The next step in the process is to complete a forward pass by working from left to right and calculating the ES and EF for each task. The earliest a task can start is immediately after the latest EF of all its predecessor activities. For example, if Activity A has an EF of day 3 (which means it finishes at the end of day 3), Activity B has an ES of day 4 (which means it starts at the beginning of day 4). If an activity has more than one predecessor, the earliest it can start is immediately after the latest early finish of all its predecessors. Figure 2-19 shows the network diagram with the forward pass completed. You can now determine that the project duration is 25 days.

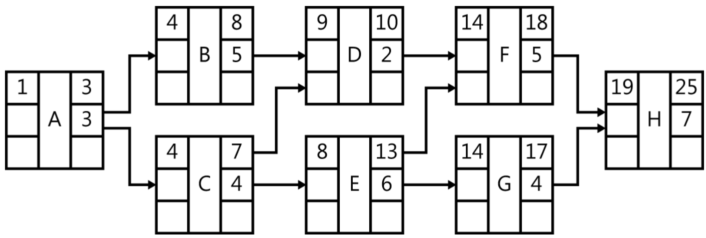

FIGURE 2-19 Forward pass is complete

The next step in the process is to complete a backward pass, in which you work from right to left, and you calculate the LF and LS for each activity. This time, when calculating the LF for an activity, you must look to its successor activities; the LF for an activity is immediately prior to the earliest of all successor LS dates. For example, if Activity D is the successor to Activity B, and Activity D has an LS of day 12, Activity B has a LF of day 11. As you complete the backward pass, you can also calculate the total slack for each task by subtracting the LS from the LF. Figure 2-20 shows a completed backward pass.

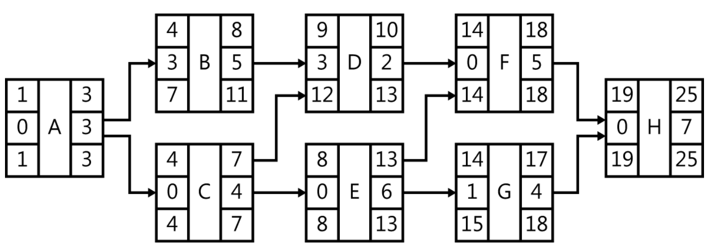

FIGURE 2-20 Backward pass is complete

To calculate which path through the network diagram is the critical one, you simply look at all the activities that have zero total float because they represent activities that, if delayed, will affect the total project duration. If you do this, you can determine that the critical path in this network diagram is A-C-E-F-H.

The project schedule can also be represented by a milestone chart or, less commonly, by the project schedule network diagram. Figure 2-21 shows an example of a Gantt chart.

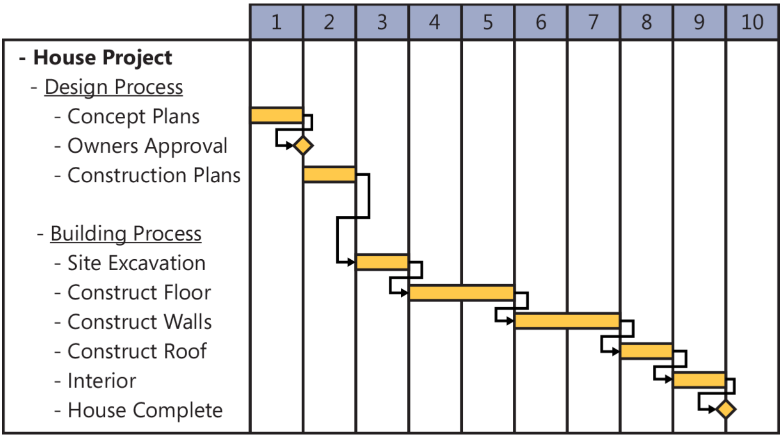

FIGURE 2-21 Gantt chart

Critical chain method

The critical chain method, which was developed by Eli Goldratt, is a scheduling method that allows for the provision of time buffers to account for project uncertainties or identified points of limited resource causing bottlenecks. Buffers can be developed using a variety of methods, including historical information, expert judgment, and statistical analysis. The buffer can be in one of two forms. The first is a total project buffer, which is used like a bank account from which time withdrawals can be made when any uncertainty in the project schedule causes delays. The other type of buffer is known as feeding buffer and it is associated with a specific point in the chain of dependent activities. The purpose of buffers is to protect the critical chain of activities from causing an increase in the total project duration. Figure 2-22 shows an example of project buffers and feeding buffers in a critical chain method schedule analysis.

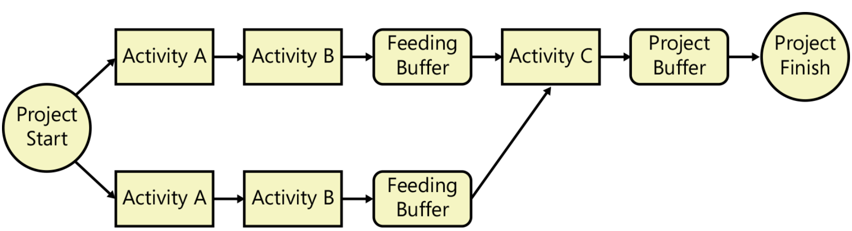

FIGURE 2-22 An example of a critical chain method

True or false? The critical chain method and the critical path method are just two different names for the same schedule analysis technique.

Answer: *False*. The critical path method analyzes the different paths through a network diagram to determine which of them presents the most risk to the project