0:00 [MUSIC]

0:13 What does it mean to say a schedule is realistic? After all, there are probably plenty of times when you are given imposed deadlines. Then you and your team work diligently to make the date.

0:25 A realistic schedule has the detailed information about the work completed.

0:30 Activities are sequenced in the right order.

0:33 Realistic schedule can be accomplished given the availability of resources. It enhances communication and it helps create your time-phased budget. We've already discussed making sure that your work packages are decomposed. And we have discussed estimating. Both important steps in the creation of your schedule. To move forward with your schedule, you need to consider in what order does the work occur? You need to sequence your activities.

1:00 Some pieces of work happen in a certain order because it's mandatory that they do so. For example, if you are building a house, you cannot paint the walls until those walls are actually standing.

1:11 Some activities happen because we like to do them in a certain order. This is what is called a discretionary dependency. There are also times when you have to do something in a certain orderbecause it is an external dependency. In other words, some agency from outside the project decides when it happens. If we are building a house, we will be subject to inspections and certifications by external agencies. They will set the date and time when they will conduct their review based on our progress.

1:42 It is important to know if you are performing work in a specific order because it is mandatory, discretionary, or due to some external agency. That way, if you find it necessary to make changes to the sequence of the work, you know if that's even possible to do.

1:57 Now beyond the mandatory, discretionary, and external, there's also the relationship between two pieces of work. So going back to our human resources process redesign, let's say we develop online modules and review online modules.

2:12 If develop online modules must be 100% completed before review online modules can begin, that is called a finish to start relationship. Develop online modules is the predecessor and review online modules is the successor.

2:28 If develop online modules needs to finish before review modules can finish, that is called a finish to finish relationship.

2:38 If you decided that developed online modules could start and then review online modules can start, that would be a start to start relationship.

2:47 Another less common type of relationship is, start to finish.

2:52 What does all that matter?

2:54 This helps to define your schedule, and the amount of time it takes for two activities in a start to finish relationship is different than if those two activities were in a start to start relationship.

3:05 The most common is the finish to start relationship. In fact, most project scheduling software tends to default, finish to start, unless you tell it otherwise.

3:16 Sometimes, in addition to the relationship, you might use either a lag or a lead. A lag adds time between activities, and a lead decreases the time between those two activities. Perhaps, there needs to be a break between two activities which would otherwise use a finish to start relationship. Maybe there's a three-day break. In that case, you would use a leg of three, and then, the successor task will start three days after the predecessor completes.

3:43 Maybe the opposite is true and the successor can actually start before the predecessor. You use a lead, a lead of minus 2, means that the successor can actually start two days before the predecessor completes. Use them very carefully.

4:00 Scheduling software takes the information you provide and works to create a schedule that's only as smart as you allow it to be. You need to understand the work, you need to create the estimates, and you need to define the correct relationships between the pieces of work or activities. The software is gonna do whatever you tell it to do. What we're gonna do, right now, is take a look behind the scenes at what your scheduling software calculates as it's creating your schedule. We are gonna use an approach that's called the critical path method. Using the proper sequence of activities, and the duration for each activity, you will see how your schedule is calculated.

4:40 Whether you know it or not, when you enter activities into your scheduling software, and you enter relationships for those activities, your scheduling software is creating what is called a network diagram. It's a flow chart of the work. There are some terms for you to know. ES is equal to early start. This is the earliest an activity can start. EF, early finish. The earliest an activity can end. LS equals late start. The latest an activity can start without causing delays. LF is late finish. The latest something can finish without causing delays. FL or SL equals float or slack. And it's the amount of time an activity be delayed without delaying the project finish date.

5:27 All of these are calculated by your scheduling software. Right now, you're gonna see how. To determine the early start and early finish, we conduct what is called a forward pass. This means starting at the left-hand side of the network diagram, the first activity or activities, and progressing to the last activity or activities.

5:47 On the first activity or activities, because there could be more than one task which occurs at the start of the project, the early start is one. The project begins on day one. To calculate your early finish, you take your early start, and you add your duration and then subtract 1. EF, or early finish, is equal to your early start plus duration, minus 1.

6:10 Now you move along the network diagram, and you're ready to calculate the start of the early start of the second activity, or activities. The activity or activities which are the successors to the first ones, the formula for this is early start is equal to the early finish of the predecessor plus 1. Okay, why the adding of the one? And why was one subtracted in the early finish of the predecessor? Let's look at it this way, if you start an activity on day one, and it's a five-day activity, it doesn't finish on day six. It finishes on day five, so watch.

6:42 I start at day one and it's five days. I go day one, day two, day three, day four, day five, but if I only did day one plus five, I would get six. Now something for us to consider. What if an activity has two predecessors? If the formula for the early start uses the early finish of the predecessor, then what early finish do you use? What do you think? Use the latest early finish, and you do this because if an activity has to wait for two other activities to complete, then it cannot start until the last one finishes. Once you complete your forward pass, you have a potential end date for your project, you have the early finish for the last piece of work to be completed on the project. Now you're ready for your backward pass. You use this to calculate your late finish and your late start. Begin with your last activity. Your late finish for this is the same as your early finish because your project can only end on one day. To calculate your late start, use this formula. Your late start is equal to your late finish minus the duration, plus 1. Now the late finish for the activity prior to the last activity is late start of the successor minus 1.

7:54 What should you do if you have an activity with two successors? Which late start will you use for your calculation? Use the smallest one. You would not purposely create a situation in which you've selected a latest finish for your work.

8:09 You use this information, and you complete your backward pass.

8:14 And then, you're ready to calculate your float. And your float is equal to the late finish minus the early finish, or the late start minus the early start. Both are gonna provide you the same answer.

8:25 You will notice that some of your activities have zero float. That means these activities have to occur as planned or you risk running late. If an ac, activity has a value of, let's say, 3 and let's say we're using days, then that means that activity can be delayed for three days without delaying the project finish. The activities, which have zero float, are on the critical path. Remember, we've been using the critical path

method. The critical path is the path which is the maximum amount of time it takes to get from the start to the finish of the project. And therefore, it's the minimum amount of time the project will take. It will take at least this much.

9:02 If an activity on the critical path runs late, the project will be late, unless you're able to remedy the situation. It's very important to understand your project's critical path.

9:12 Keep in mind the network diagram we just created doesn't take into consideration, holidays or vacation time, or resource availability. We're ending our example here but you would not use what we have to report your project completion date. With all of our planning of scope and schedule and budget, we also must include quality.

9:31 As the project manager, you're responsible for ensuring that your team creates a quality product or service. You might have a quality manager working with you, but that doesn't mean that you are not responsible.

9:43 The time to plan for quality is from the start of the project. As you write the charter, you consider what it means to say that your customer or sponsor has accepted your work.

9:56 As you define your scope, you consider what it means to say that the scope has been completed and that it is of the quality expected by your customer or sponsor. As you create your work breakdown structure, you want to work with your team to define acceptance criteria for each work package. Does someone need to test or review the work package? Does someone need to sign off?

10:21 These reviews and sign offs are important parts of the project and should be planned and scheduled, and budgeted.

10:30 Plan for quality control before you need it, understand what tools and processes are available to you, and engage your quality management team from the start of your project. You will be glad that you did.