Learning Objectives

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

1. Compare unfavorable and favorable risks.
2. Discuss how project uncertainties can impact a project.
3. Describe why it is important to have systematic processes when addressing possible uncertainties.
4. Indicate the possible dimensions of uncertainty and how they can impact a project.
5. Interpret the importance of the project uncertainty assessment plan.
6. Compare and contrast the various tools available for assessing project uncertainties.
7. Explain the benefits of using simulation tools to assess potential uncertainties during a project risk assessment.
8. Identify how to supplement project resources when faced with project uncertainties.
9. Explain why it is important to monitor project uncertainties and how to implement monitoring.

Written Lecture

Examples of Project Uncertainties

We all have had to deal a potential problem, surprise, or what the textbook refers to as a project uncertainty. As a project leader or manager, it is your job to be able to foresee potential problems, anticipate the fallout of potential problems, and be able to effectively respond and react. This unit will discuss how to predict the uncertainties, how to handle them, and how to make a potential issue become a positive for the project rather than a negative. The two types of project uncertainties are unfavorable project risks and favorable project risks. Unfavorable project risks are those that have a negative effect on the project. Favorable project risks happen when the project can use the uncertainty in a positive manner. Both of these can have a major impact on a project and the organization, depending on how the risk is identified, assessed, and handled by the team.

The Role of Project Uncertainty Assessment

In order to be able to address these potential challenges, it is important to understand uncertainty analysis. This is an ongoing process that we have all used at some point. It is looking at the project phase by phase and looking at possible concerns and problems that can have an impact on the project at. It is important to identify these and be prepared to address them. An uncertainty of some sort will inevitably creep up on a project, which is why it is imperative to be as prepared as possible for what may or may not come your way.
Dimensions of Uncertainty

There are many potential risks a project team may face. To properly prepare for this, it is important that project teams look at the various uncertainty possibilities: source, outcome, and likelihood. Uncertainty sources can generate both unfavorable and favorable uncertainties (refer to Exhibit 6.1). The source can be identified as a financial source, a technical source, a business environmental source, a social source, and an external or natural environmental source. It is important to note that these can come independently or even as a cluster.

The outcome is the consequence of a potential risk. This can be manageable issues and can also be found in situations that are very difficult to control. Examples of this can be something as simple as scheduling conflicts, overruns in cost, and product quality.

The likelihood is what happens when the team does its best to predict a possible outcome. For this to be successful, it is important for both the likelihood and the potential impact to be analyzed. This can help the team understand the possible likelihood and how to handle the impact in the best possible manner. Refer to Exhibit 6.2. It is also possible for the project to be impacted positively by an uncertainty; this means it could make the project better or present new opportunities. While this can happen, it is important the team not lose its original focus or leap too far from the project itself.

The Uncertainty Assessment Planning and Action Process

As with most situations, it is important to assess and plan for what may or may not be a potential problem. When working on a project, it is imperative that uncertainty assessment should be an ongoing part of all aspects of the project, especially once the goal and WBS have been defined. Following and assessing throughout the project allows for uncertainties to be addressed, time for strategizing to take place, as well as ways to monitor the situation. Exhibit 6.4 shows the progression of assessment planning.

Tools for Assessing Project Uncertainties

Once the assessment for uncertainties has been done, there needs to be preparations to address and respond to the possible situations, whether they are unfavorable or favorable uncertainties. Box 6.2 provides an example of how the two potential uncertainties can be addressed. There may not be a way to avoid uncertainties; however, being prepared and having a plan or strategy in place to address them will make the actual uncertainties easier to manage.

There are useful tools to help assess project uncertainties. Risk mapping is useful when working on a smaller project. A team brainstorms the possible risks and identifies each risk’s potential impact on the project. As a group, the team can talk through each, decide on a course of action for each, and set a preparation plan for each. This is beneficial for both unfavorable and favorable risks.

Failure Modes and Effects Analysis (FMEA) is another useful tool when attempting to plans and identify uncertainties. This process was originally developed to identify product design problems. It can also be used to in project development. The general idea is to brainstorm for potential problems then rate each one for likelihood, difficulty of problem, and severity of the potential
problem. Once this is done, a risk priority score is assigned for each potential problem. For an example, refer to Exhibit 6.9, but keep in mind that each team can develop his/her own set of scoring criteria.

The gut-feel method follows the FMEA concept, except it also includes a visual chart of ideas, risks, and how they could impact the project. There are twelve steps to this process. (Refer to Exhibit 6.10 for details and Exhibit 6.11 for an example of how the graphing occurs.)

The Delphi Method, works similarly to the others, except rather than having the team come together to initiate brainstorming, this method allows for a team to meet virtually. The upside to this concept is the opportunity for a much larger team to work together without each person having to be personally present. It also allows for more technology to be used.

The fishbone concept follows the same layout as discussed in Chapter 3. This concept of brainstorming is quite useful when combined with one of the previously mentioned methods. Refer to Exhibit 6.16 for an example.

Technical simulation is usually associated with project risk analysis and is usually not done in conjunction with the previous tools we have discussed, which may make them less useful. According to The American Heritage College Dictionary, quoted in the textbook, simulation is the “Representation of the operation or features of one process or system through the use of another” (Brown & Hyer, 2010, p. 187). In this case, there are six processes we will look at.

1. A physical mock-up is a 3D model of a product. It allows for actual input from users.
2. Dress rehearsal is exactly what it sounds like—a practice run through of the event or activity.
3. With tabletop exercises, team members imagine themselves in different scenarios and may use miniature props while brainstorming the situations.
4. Market tests and clinical trials are often used when there is customer input and feedback. How the project identifies the question and how they use the information determines how effective this method is.
5. Technical simulation is a software option that allows project teams to see what issues might arise through the use of technology.
6. System dynamics modeling uses a combination of variables and is useful in complex projects.
7. Monte Carlo simulation is another software option often used to identify various risk factors.

Next Steps: Monitoring Project Uncertainties

Now that we have an idea of what tools are effective and the part they play in identifying uncertainties, it is important to realize these also need to be monitored throughout the project. This is also useful when identifying new issues or issues that did not develop. Please refer to Exhibit 6.18 for an example of a way to log or record this information.

Projects have the possibility to take on a life of their own. Some risks are unfavorable and some risks may develop into a favorable risk. This is why it is important to prepare for whatever may develop. Not only do you need to be prepared, but it is imperative to have a plan. Chapter 6 offers ways to identify these uncertainties, how to deliver a plan, and tools that will be useful in this process.
Reference


Supplemental Reading

Click [here](#) to access a PDF of the Chapter 6 Presentation.

Learning Activities (Non-Graded)

Flash Cards

For a review of the Key Terms of the unit, click [here](#) to access the interactive Chapter 6 Flash Cards. (Click [here](#) to access a PDF version of the Glossary.) This is an optional, non-graded assignment.

Project Assessment

Review mind mapping from the previous unit activity. Find some uncertainties that might occur in the project. In this activity, you will write a process to assess the uncertainties in your project; identify positive and negative uncertainties and recommend solutions for any uncertainties.

The paper should be at least three pages long. You can include tables and graphics in your paper. Because this is a non-graded activity, you do not have to submit it. This activity is designed to help you comprehend and retain the material in the chapters more easily, and you should save it for future reference.