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

4. Explore the dynamics of project teams.
   4.1 Describe the positive and negative risks of a project and how they can affect the project team.
   4.2 Identify risk response plans based on the key processes of project risk management and how team members can play a role in these plans.

Reading Assignment

Chapter 14: Risk

Unit Lesson

Project risk is an uncertain event in the future, and if it occurs, it will have a positive or negative impact on one or more project objectives, including scope, schedule, cost, and quality. Risk may have one or more causes such as requirement, assumption, and constraints or conditions that create the possibility of negative or positive outcomes.

It is normal even for the extremely organized and most carefully planned project to run into unexpected troubles. Several factors such as inadequate resources, the project environment, the project management processes, and other facets can contribute to project risks. We will be able to anticipate some risks in advance and come up with response plans; other risk events will occur unannounced during the project. Team members can get sick or quit unexpectedly, sudden weather change can drastically limit your options, and even resources that you are depending on may become unavailable. The purpose of risk management is to identify potential problems that could cause concern for your project, analyze how likely and at what frequency they will occur, take preventive actions for the ones you can avoid, and minimize the impacts and probability for the ones you cannot avoid. There are two generalized types of risk:

- business risk (risk of loss/threat or gain/opportunity) and
- pure risk (only a risk of loss/threat)—are sometimes also called insurable risks and can include events like fire, theft, personal injury, and other elements.

Opportunity (Positive Risk): These are the risks with positive effects. It is a favorable situation in the organizational environment. Some examples include the arrival of new technology or the removal of an international trade barrier. In addition, the fulfillment of a previously unfulfilled customer need may have a significant positive impact on your project.

Threats (Negative Risk): These are external elements in the environment that arise from political, economic, social, and technological (PEST) forces and can cause trouble for the business. Some examples can include new regulations, increased trade barriers, or the emergence of substitute products.
A few additional threats include the following:

- anything external that might cause problems, damage, or injury;
- technological developments that may make your offerings obsolete;
- market changes that may result from changes in customer needs, competitor's moves, or demographic shifts; or
- the current political situation in the nation or world that can determine government policy and taxation structure.

The same event can be an opportunity for some organizations and a threat for others at the same time. NASA has been working with several companies to send spacecraft to the international space station on a regular

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[redacted] NASA has also been working with a few nanotech companies on building an elevator from the ground to the space station to transfer the equipment, manpower, and other [redacted] conveniently and cheaply. So far it has not been successful since no material that could be used to build the elevator can take the air pressure. These nanotech companies are working on carbon nanotubes that are capable of taking the air pressure and will not break. This emergence of a substitute product or arrival of new technology is a huge opportunity for these nanotech companies but a huge threat for others working with NASA on the spacecraft.

Project Risk Management

Project risk management is a systematic approach to identification, analysis, response, and control of project risk. The objectives of risk management are to increase the probability and impact of positive events and to decrease the probability and impact of adverse events. Project risk management is an iterative, continuous process, in which risks are identified and managed once the project is initiated, and then they are modified, updated, added, and reassessed throughout the project lifecycle. Project manager and team responsibilities in risk management include the following:

- understanding organizational attitude to risk and the attitude to risk of the project team,
- developing a consistent approach to risk management,
- developing an environment of open and honest communication abut risk and risk handling,
- committing to addressing risk proactively and consistently throughout the project, and
- not *focusing* on dealing with problems but instead preventing them (Project Management Institute, [PMI], 2013).

Some important risk management concepts include the following:

- Project risk event—actual occurrence of the risk, such as equipment failure.
- Project risk condition—related to the environment in which the project is run.
- Risk triggers—symptoms or warning signs that a potential risk is about to occur in the project. For instance, a key team member searching for a better job opportunity is a warning sign that the person may be leaving the team soon causing schedule delay and increased cost.
- Uncertainty—state characterized by the absence of information related to an outcome. A risk has uncertainty in both the occurrence and the outcome. It is typical of most projects that uncertainty and risk diminish as the project proceeds (PMI, 2013).

Risk factors are aspects of risk that should be considered, including the following:

- Source: Where is the risk coming from?
- Probability: What is the possibility of the risk event to happen?
- Impact: What are the possible outcomes?
- Timing: Consider the expected timing of risk events in the project life cycle.
- Frequency: Consider the anticipated frequency of risk events from the source.

Other concepts related to risk include the following:

- Risk Averse—someone who does not want to take risk.
- Risk Appetites—high-level, generic description of the acceptable level of risk in the project. For example, the customer is okay with accepting some cost and schedule risk in the project.
- Risk Tolerance—Areas of risks where risks can be acceptable or unacceptable. A risk that will affect the reputation of a company will not be tolerated, but a financial risk can be acceptable. Thus, reputation is not an area of risk tolerance, but finance can be.
- Risk Threshold—Amount of risk that is acceptable. For instance, a company is okay with a financial risk of $30,000 but not more than that; thus, the threshold here is the amount of financial risk the company is willing to consider (PMI, 2013).

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This risk management plan addresses all the project's risk management approach, creates the boundaries, expectations, and general rules for managing risks in the project. The first step is to identify risks where the project team, the project manager, the project sponsor, vendors, stakeholders, end users, and even customers can contribute if required. The next step is to assess the probability and impact of all the risk items. Then it is off to quantitative analysis, where the risk's probability and impact are quantified.

The team must make an effort to prevent the risk items from happening and should always identify preventive actions as well as contingency actions. Ongoing monitoring and controlling of the risk events and their impact is essential to effective risk management. Risk register is the project's journal and database of risks, their status, impact, and any supporting detail about the risk events and a key output for all these risk management processes.
PMI identifies six key processes that are associated the with risk management knowledge area.

Processes	Process Groups	Detail	Key Outputs
1.Plan Risk Management	Planning	The process of deciding how to approach, plan, and execute risk management activities	Risk Management Plan
2.Identify Risks	Planning	The iterative process of identifying all the risks that may impact the project, documenting them, and identifying their characteristics	Risk Register
3. Perform Qualitative Risk Analysis	Planning	The process of prioritizing risks for subsequent further analysis or action by assessing and combing their probability of occurrence and impact	Project Document Updates
4. Perform Quantitative Risk Analysis	Planning	The process of numerically analyzing the effect of overall project objectives of identified risks	Project Documents Updates
5. Plan Risk Responses	Planning	The process of developing options and actions to enhance opportunities and reduce threats to project objectives	Project Documents Updates
6. Control Risks	Monitoring & controlling	The process of identifying, analyzing, and planning for newly arising risks, keeping track of the identified risks, reanalyzing existing risks, monitoring trigger conditions, monitoring residual risks, and reviewing the execution and effectiveness of risk responses.	Work performance information Change Requests

(*PMI, 2013*)

Reference

Project Management Institute. (2013). *A guide to the project management body of knowledge* (5th ed.). Newton Square, PA: Project Management Institute.

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