7 Project Risk Management

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Learning objectives

By the time you have completed this chapter you should be able to:

- ☐ Understand the importance of risk management in projects
- ☐ Explain and implement a risk management process
- ☐ Describe the role of contingency planning on a project
- ☐ Design and complete a risk information sheet
- ☐ Create and control a risk register.
- ☐ Discuss Agile methodology in the context of risk management.

Introduction

Regardless of variations in time or place and size or type of project, risk will always exit. Intuitively, almost all rational human beings get involved in risk management activities on a daily basis, one way or another. Since the time one wakes up in the morning there are so many risks that face all one of us. Waking up late may result in missing the bus or a train or even a flight. Driving to work involves a number of possibilities that can have negative consequences. It is not a pleasant experience when the car does not start due to a flat battery or cannot run due to a flat tyre. Every driver is aware that road accidents are likely to happen and some accidents can unfortunately be fatal. Yet people do not stop using their cars in commuting both for business and leisure. Similarly, all projects are prone to risk and some risks can have very serious consequences, but this does not stop project managers from delivering their projects. It is imperative that project managers should be aware of how to manage project risks effectively.

Conditions of certainty, risk and uncertainty

Whenever there is an event that is known will happen sometimes, somehow, but that will certainly not happen at any specific known time with a predetermined level of severity, it is said that there is a *condition of risk*. If the event is certainly going to happen, i.e. there is no probability involved, and the consequences are known then this becomes a *condition of certainty*. When neither the event nor its probability is known, it is a *condition of uncertainty*.

For example, prior to 1992, Egypt had never experienced any earthquakes. Hence, the code for building never considered earthquakes as a risk. It was regarded by project risk analysis as an uncertainty unlike the case in other countries like Japan where construction experts are familiar with earthquakes and the code for buildings, particularly foundations, is designed to take this risk into account. In 1992, Egypt was hit by a strong earthquake that had serious impact on buildings and people. Many buildings either cracked or completely collapsed with subsequent casualties in people either injured or died. Since that date, risk analysts in Egypt regard earthquake as a risk event and the code for buildings has changed to account for, the now, possible event of earthquake.

All project managers know that projects can face many unpleasant events, such as bad weather during winter time in Canada, when it is quite difficult to do any road works due to the very heavy and almost continual snow. However, there are days during winter where the weather is milder; at least no storms. So for a project manager who is requested to undertake some urgent roadwork that cannot wait until the spring/summer time, there is a risk that the weather forecast might not be accurate. Hence, there will be implications on both the cost and the progress of the project, as work will stop during severe weather conditions. Project managers know that forecasts can be inaccurate sometimes, so the event is known but what is the probability of this event happening and how this will impact the project? This is what needs to be determined through a detailed risk analysis process.

Conditions of certainty on the other hand are different. In golf, the probability of getting the ball in the hole depends on a number of variables, but if the ball is right on top of the hole, there is no probability involved. Even some wind may blow it down the hole! If someone is shooting at a distance, there is a probability that it will be a miss, but if the gun is very close to the target, almost touching the target body, then there is no probability of missing. In this case, the probability of hitting is said to be 100% and the consequences are determined for sure.

To summarize this section it might be useful to use the well know jargon ‘known-known’, ‘known-unknown’ and ‘unknown-unknown’ to refer to the conditions of certainty, risk and uncertainty respectively.

7.1 Project risk management

A risk can be defined as "the combination of the probability of an event and its consequences" (ISO, 2002). For something to be considered a 'risk' there must be a number of determining factors: First of all there needs to be an 'event' or specific occurrence of the risk. Second, there needs to be a possibility of the risk occurring. Third, if the risk does occur, it would have either a negative or positive outcome. In terms of projects, a risk is commonly viewed as having an adverse impact on the project.

Project risk management is the proactive approach of dealing with the inherent conditions of risk within projects. It is concerned with developing a systematic process to manage all the possible risks on a project, before and after they occur. This involves identifying, analyzing and responding to any risks throughout the project life cycle and seeking to control the level of impact, should a risk occur.

Project risk management should be an iterative process that continues throughout the project lifecycle. This is because project risks can occur at any time in the project and some risks will not be apparent until its later stages.

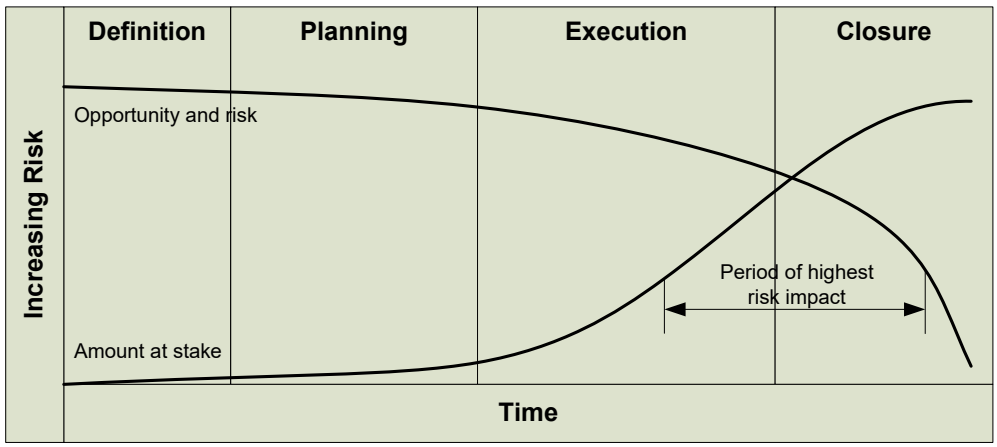

Figure 7.1: Risk versus the amount at stake

As demonstrated in Figure 7.1, the level of risk is greatest at the early phases of the project. This is because during the definition and early planning stages there is a greater degree of ambiguity regarding the future and the greatest degree of unknowns regarding project details. As the project progresses the level of ambiguity is reduced as decisions are made, designs are implemented and the remaining unknowns become known, until a zero point is reached (Burke, 2003). Conversely, the amount at stake, in terms of investment, is minimal at the start, as only a few resources have been committed to the project. As the project