Risk Management

Introduction:

Risk Management is an important part of project planning activities. It involves identifying and estimating the probability of risks with their order of impact on the project.

Risk Management Steps:

There are some steps that need to be followed in order to reduce risk. These steps are as follows:

1. Risk Identification:

Risk identification involves brainstorming activities. it also involves the preparation of a risk list. Brainstorming is a group discussion technique where all the stakeholders meet together. this technique produces new ideas and promotes creative thinking.

Preparation of risk list involves identification of risks that are occurring continuously in previous software projects.

2. Risk Analysis and Prioritization:

It is a process that consists of the following steps:

- Identifying the problems causing risk in projects
- Identifying the probability of occurrence of problem
- Identifying the impact of problem
- Assigning values to step 2 and step 3 in the range of 1 to 10
- Calculate the risk exposure factor which is the product of values of step 2 and step 3
- Prepare a table consisting of all the values and order risk on the basis of risk exposure factor

For example,

TABLE (Required)

Risk No	Problem	Probability of occurrence of problem	Impact of problem	Risk exposure	Priority
R1	Issue of incorrect password	2	2	4	10
R2	Testing reveals a lot of defects	1	9	9	7
R3	Design is not robust	2	7	14	5

3. Risk Avoidance and Mitigation:
The purpose of this technique is to altogether eliminate the occurrence of risks. so the method to avoid risks is to reduce the scope of projects by removing non-essential requirements.
4. Risk Monitoring:
In this technique, the risk is monitored continuously by reevaluating the risks, the impact of risk, and the probability of occurrence of the risk.
This ensures that:

- Risk has been reduced
- New risks are discovered
- Impact and magnitude of risk are measured

The Nature of Risk:

For the purpose of identifying and managing those risks that may cause a project to overrun its time-scale or budget, it is convenient to identify three types of risk:

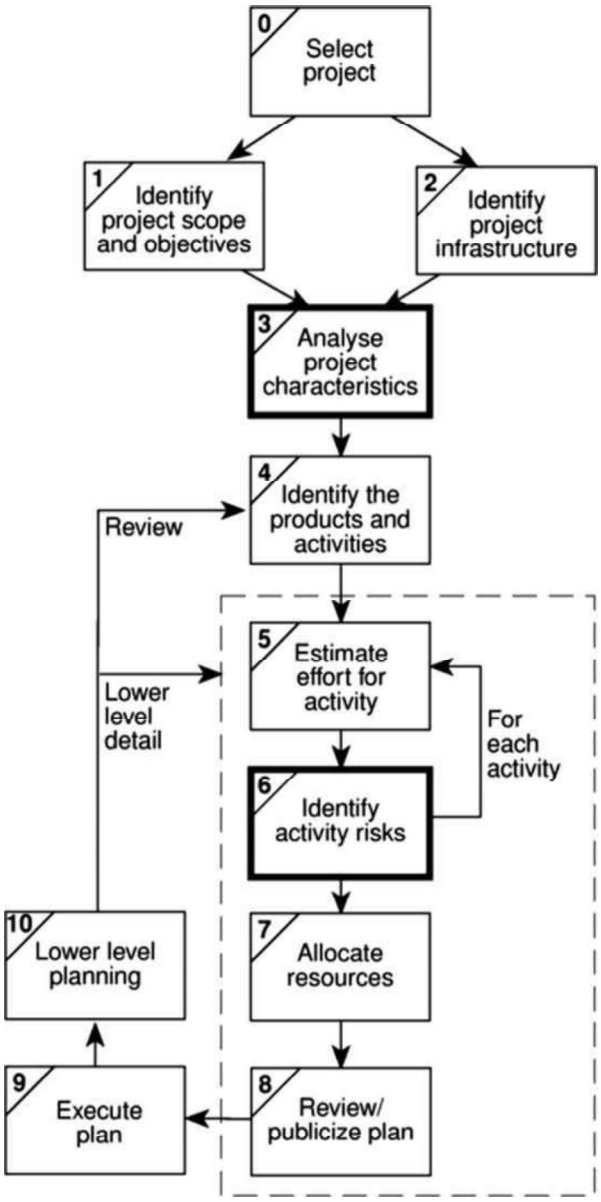

Figure 7.1 Risk analysis is carried out in Steps 3 and 6.

Improved quality control should make it easier to predict the time required for program and system testing.

Figure 7.1 Risk analysis is carried out in Steps 3 and 6.

• those caused by the inherent difficulties of estimation;

• those due to assumptions made during the planning process;

• those of unforeseen (or at least unplanned) events occurring.

Estimation errors

Some tasks are harder to estimate than others because of the lack of experience of similar tasks or because of the nature of a task. Producing a set of user manuals is reasonably straightforward and, given that we have carried out similar tasks previously, we should be able to estimate with some degree of accuracy how long it will take and how much it will cost. On the other hand, the time required for program testing and debugging, might be difficult to predict with a similar degree of accuracy - even if we have written similar programs in the past.

Estimation can be improved by analysing historic data for similar activities and See Chapter 5 for similar systems. Keeping records comparing our original estimates with the final methods of estimation, outcome will reveal the type of tasks that are difficult to estimate correctly.

Planning assumptions

At every stage during planning, assumptions are made which, if not valid, may put the plan at risk. Our activity network, for example, is likely to be built on the assumption of using a particular design methodology - which may be subsequently changed. We generally assume that, following coding, a module will be tested and then integrated with others - we might not plan for module testing showing up the need for changes in the original design but, in the event, it might happen.

At each stage in the planning process, it is important to list explicitly all of the assumptions that have been made and identify what effects they might have on the plan if they are inappropriate.

Eventualities

Some eventualities might never be foreseen and we can only resign ourselves to the fact that unimaginable things do, sometimes, happen. They are, however, very rare. The majority of unexpected events can, in fact, be identified - the requirements specification might be altered after some of the modules have been coded, the senior programmer might take maternity leave, the required hardware might not be delivered on time. Such events do happen from time to time and, although the likelihood of any one of them happening during a particular project may be relatively low, they must be considered and planned for.

Managing Risk:

Once you have identified the risks that may affect your project, the next step is managing them. The first thing you should do is determine your project's risk tolerance. If you're considering how to manage risk in a project, start with these steps:

Step 1: Determine your "risk tolerance"

How much risk can you take on before you consider abandoning the project? This is an essential conversation to have with your stakeholders.

Step 2: Decide which risks to manage

Once you've determined the project's risk tolerance level, you can start to identify which risks are worth your time and attention. Even if a risk has a high probability of occurring, if its impact is small — say it would add $200 to your project costs and your budget is $50 million — you may choose to ignore it if counteracting the risk isn't a good use of your time and resources.

Step 3: Identify project risk triggers

What cues might indicate a particular risk is imminent? Determine the factors that may act as catalysts in bringing your risks to life.

Step 4: Create an action plan

If a risk occurs, what's the most effective response? What will your team do, and who's responsible for what? Make sure you've thought each piece through and everyone on your team knows the plan. You may be wondering how to mitigate risk in project management. Think about what can be done to reduce the probability of a risk occurring, or minimize its negative impact. For instance, can you provide hand sanitizer during flu season? Or spread important tasks among the team so progress can be made even if some members are out sick for a few days? You'll never be able to completely eliminate uncertainties, but having a plan in place can keep small problems from growing into full-blown catastrophes. Note that risk management isn't something you do once — it's an ongoing process you should keep up throughout your project.

Risk Identification:

risk as "an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives." Potential risks include external, internal, technical, or unforeseeable threats and opportunities to your project and deliverables.
Risk identification is especially important during the planning process, but it should continue throughout the life of a project.

New risks or information about existing risks can come up as you progress through your project. Having a solid process to identify risks during project execution will help the project team effectively identify risks during the project and avoid schedule overruns, budget overruns, and a volatile stakeholder relationship.

Ten Common Barriers to Risk Identification
You may face some barriers that could prevent you from identifying risks. Here are ten common barriers outlined by PMI:

1. **Identification quality**: how precise, accurate, applicable, or relevant is the risk you identified?
2. **Imagination**: what limits your project team's ability to think of all plausible risks?
3. **Inadequate planning approach**: if your planning approach is not well or fully developed, you may not be able to identify the proper risk areas.
4. **Lack of knowledge**: if you and your project team lack or can't access sufficient project, technical, or subject matter expertise, such as applying risk identification tools and techniques, you are likely to struggle with identifying risks.
5. **Lack of management support**: is your risk identification activity supported from the top down? Any resistance or lack of support can impede identifying risks.
6. **Level of detail**: it can be challenging to determine how detailed your risk exploration and documentation should be. Too little detail may cause you to overlook some critical risks.
7. **One observation**: limiting yourself to a single risk identification activity severely limits the potential risks you can identify for your project.
8. **Risk attitude**: your project team being too reckless or too risk-averse can affect the quality of your risk identification activities.
9. **Time and cost constraints**: if you are limited on time or budget, you may not be able to conduct sufficient risk identification activities.
10. **Too many assumptions**: you may find yourself making project decisions based on assumptions. Making too many assumptions complicates your risk analysis and identification activities.

Risk Analysis:

Risk analysis is the process that figures out how likely risk will arise in a project. It studies the uncertainty of potential risks and how they would impact the project in terms of schedule, quality and costs if, in fact, they were to show up. Two ways to analyze risk are quantitative and qualitative. But it's important to know that risk analysis is not an exact science, so it's important to track risks throughout the project life cycle.

Types of Risk Analysis

There are two main types of risk analysis, qualitative and quantitative risk analysis. Let's learn about these two approaches.

Qualitative Risk Analysis

The qualitative risk analysis is a risk assessment done by experts on the project teams, who use data from past projects and their expertise to estimate the impact and probability value for each risk on a scale or a risk matrix.

The scale used is commonly ranked from zero to one. That is, if the likelihood of the risk happening in your project is .5, then there is a 50 percent chance it will occur. There is also an impact scale, which is measured from one to fine, with five being the most impact on the project. The risk will then be categorized as either source- or effect-based.

Once risks are identified and analyzed, a project team member is designated as a risk owner for each risk. They're responsible for planning a risk response and implementing it.

Qualitative risk analysis is the base for quantitative risk analysis, and it's beneficial because not only do you reduce uncertainty in the project, but you also focus mostly on high-impact risks, for which you can assign a risk owner and plan out an appropriate risk response. Get started with qualitative risk analysis with our free risk assessment template.

Quantitative Risk Analysis

By contrast, quantitative risk analysis is a statistical analysis of the effect of those identified risks on the overall project. This helps project managers and team leaders to make decisions with reduced uncertainty and supports the process of controlling risks.

Quantitative risk analysis counts the possible outcomes for the project and figures out the probability of still meeting project objectives. This helps with decision-making, especially when there is uncertainty during the project planning phase. It helps project managers create cost, schedule or scope targets that are realistic.

The Monte Carlo simulation is an example of a quantitative risk analysis tool. It's a probability technique that uses a computerized method to estimate the likelihood of a risk. It's used as input for project management decision-making.

Risk Analysis Methods

There are several risk analysis methods that are meant to help managers through the analysis and decision-making process. Some of these involve the use of risk analysis tools such as charts and documents. Let's dive into these risk analysis methods and how they can help you.

Bow Tie Analysis

This qualitative risk analysis method is used to identify causes and consequences for all potential project risks. The project management team must first identify risks that might affect the project and then think about causes, consequences and more importantly, a risk mitigation strategy for them. It's a very versatile method that can be used in any industry.

Risk Analysis Matrix

The risk analysis matrix assesses the likelihood and the severity of risks, classifying them by order of importance. It's main purpose is to help managers prioritize risks and create a risk management plan that has the right resources and strategies to properly mitigate risks. Risk likelihood is measured on a relative scale, not a statistical one, which makes it a qualitative risk analysis tool.

Risk Register

A risk register is a crucial project management tool to document project risks. It's a document that lists all the potential risks that could occur during the project execution phase, as well as critical information about them.

It's meant to be used as an input for the risk management plan, which describes who's responsible for those risks, the risk mitigation strategies and the resources needed. Creating a risk register usually involves several, reliable information sources such as the project team, subject matter experts and historical data.

SWIFT Analysis

SWIFT stands for Structured What If Technique. It's a risk analysis method that focuses on identifying potential risks associated with changes made to a project plan. As its name suggests, team members have to come up with any "what if" questions they can to find out all the potential risks that could arise.

Risk Analysis Templates

There are several quantitative and qualitative risk analysis methods and that can be confusing. On top of that there are several tools that can be used for different purposes. For those reasons, we've prepared some free risk analysis templates to help you through the risk analysis process.

Risk Register Template

This risk register template has everything you need to keep track of all the potential risks that might affect your project as well as their probability, impact, status and more.

Benefits of Risk Analysis

To understand risk analysis, note the importance of examining risk in methodical detail. Why? There are several reasons.

- Avoid potential litigation
- Address regulatory issues
- Comply with new legislation
- Reduce exposure
- Minimize impact

Risk analysis is an important input for decision-making during all the stages of the project management cycle

Project managers who have some experience with risk management in projects are a great resource. We culled some advice from them, such as:

There's no lack of information on risk

Much of that information is complex

Most industries have best practices

Many companies have risk management framework

Risk analysis is done in extremes

Reducing the Risks:

Any discussion of project risks needs to recognise that all projects have risks. The very nature of a project is not "business-as-usual" – projects tend to go beyond the status quo – and that will always pose some measure of risk. It is important is to accept that there will be risks, but also recognise that risks need to be managed in order to minimise them. Projects where risks are actively managed and controlled are more likely to be successful. But how exactly can you handle and reduce project risks as a project manager?

Effective risk management has a number of possible objectives, such as:

- to prevent risks happening, where possible, that pose a threat to delivering a successful project outcome;
- to mitigate risks that cannot be avoided by planning the most appropriate response; and
- to act upon risks that might present positive opportunities. That is, viewing risk from a different perspective – one that does not always assume risks are bad for a project.

Activities designed to reduce project risks are an integral part of project management. One of the biggest hurdles to overcome in terms of risks in project management is identifying the risks in the first place! Sometimes it is impossible to know in advance about certain types of risks. For example, if your project involves cutting-edge innovative technology, then predicting the possible risks is taking a shot in the dark.

But, there are also some risks that are common across many projects or risks that certain team members may be aware of, but don't communicate to project managers or project leaders.

One way to reduce risks is to gather as much information as possible that might help you identify possible risks. This can be done through tried and tested methods such as brain-storming, story-boarding or interviewing individuals from all parts of operations related to a particular project. Working through a structured project plan template will also help you to map out potential risks, as it will encourage you to strategically approach and analyse the project each step of the process.

Once you have documented the identifiable risks, you will be in a much better position to prevent them or mitigate them; and if you manage those well then any unforeseen risks are likely to have a lesser impact on the overall project. There are 4 essential steps to reducing risk: documenting, prioritising, avoiding and mitigating.

Documenting

Document each risk in detail, including their potential impacts and possible responses to mitigate the risk. Then, assign a team member to monitor each risk as your project progresses. Keep this risk log updated throughout the project.

Prioritising