

Chapter 2: Risk Management

Risk management

Is continually reevaluating the risks that have been defined and identifying new ones.

Risk management is both a planning and a managing activity. It is not enough to set down some risks at the start of the project and then ignore them. You must manage them.

Managing risks means continually reevaluating the risks that have been defined and identifying new ones. There are three main mechanisms for managing project risks; since they are only potential problems, they are lower in priority than real ones. Therefore to manage risks, you must ensure that they are an overt part of the project team's, and your, consciousness.



All team members must be aware of the risks that have been identified and awake to situations that affect them. To keep risks visible, devote part of each team meeting to a "risk review" in which the risks are addressed one by one, and team members are instructed to comment on any thing that affects each risk. The purpose of the risk review is not to take action; it is to identify what risks, if any, have changed. The risk review also uncovers new risks as team members become attuned to dangerous situations.

Your project status report should include a section entitled "Risk Review" in which you report on risks that have become more, or less, probable or serious. By regularly reporting risks, you are also able to prepare management for unpleasant news so that it does not come as a surprise.

Project manager reflection is thinking time apart from the daily activities of the project. Devote part of that thinking time to reviewing existing risks and identifying new ones.

Prepare a risk management work sheet, similar to the one in Table 2.1. The sample work sheet contains a short name of the risk to be used in status reports or risk reviews, a longer description, and a table to track how the risk has changed. When a risk has been eliminated, enter "Resolved" under "Comments." The risk management work sheet keeps the risks visible.

What If others claim that you have overstated the risks?

You may be faced with complacency on the part of the client or an unwillingness to plan for problems. This becomes serious when the client refuses to expend resources to mitigate a risk that you see as high or extreme

Actions



Seek other, less expensive mitigation procedures that you can use to reduce the risk to some extent.

2.1 Actions

Seek other, less expensive mitigation procedures that you can use to reduce the risk to some extent.

Document your reasons for categorizing the risks as you did. State the probability and describe the impact in graphic terms. **Present your analysis** to the steering committee and request the resources you need to mitigate the risk.

Table 2.1: Risks management worksheet

Risk Management Worksheet				
Project : _____		Date : _____		
Short name of the risk :				
Description of the risk:				
Date	Comments	Probability	Impact	Degree
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you are not given the resources you requested, alert your management to the danger and ask if they can apply leverage to the client.

Plan the actions you will take if the risk materializes.

You could be faced with a large number of high or extreme risks, all of which require effort and action. You could also be led into mitigation procedures that are excessive, expensive, and time-consuming.

If the risk assessments of others lead to a large number of high or extreme risks, ask the complainants whether they really believe the project is this risky and, if so, whether it should be undertaken. Most people will back down and acknowledge that things are not as risky as they have made out.

Honor the risk assessment from others who are knowledgeable, but do not be intimidated into abandoning your own view of the risk. You will encounter people who will claim, usually loudly, that a risk is "unacceptable" and cannot be mitigated except by the most extreme safeguards. If your experience and that of others on your team tells you that this opinion is alarmist, respect the risk, but prepare your plans based on a more reasonable assessment.

Identifying Risk and Risk Classification

A hazard chance of bad consequence

2.2 Identifying Risk and Risk Classification

Risk can be defined as: hazard chance of bad consequence or loss exposure to mischance. This definition captures the essence of project risk, except that it implies that things are only expected to go wrong. *On projects, some risks carry an inherent chance of profit or loss, and some carry a chance of loss only. The former are called business risks and the latter insurable risks.*

Business Risks



2.2.1 Business Risks

The majority of risks are business risks. That is true for any part of the operation, but especially for projects. On a project, business risks may include: response of the market to a product; inflation weather or the performance of technology and resources. The manager's role is to increase the chance of profit and reduce the chance of loss. However, the expectation is that, on average; the risks will turn out worse than better because although the likelihood of profit and loss may be the same, the maximum, possible loss is very much greater than the maximum profit. The weather may be kind as often as it is unkind. However, bad weather can stop work completely or even destroy previous work, but good weather seldom allows work to proceed at double the normal pace.

Insurable Risks

Lead to loss only and are caused by external, unpredictable factors

2.2.2 Insurable Risks

Insurable risks lead to loss only, and are usually caused by external, unpredictable factors. These are called insurable. But it is not always possible to find a company to provide cover. For example, war and civil disturbance are insurable risks, but are excluded from most policies. Insurable risks fall within four areas:



- Direct property damage
- Consequential loss
- Legal liability
- Personal loss.

Direct damage can be to the facility, or to plant and equipment being used in its delivery, and may be caused by fire, bad weather, or damage during transportation. Consequential loss is lost production

arising from the facility's being unavailable due to direct property damage. It may be lost revenue or the cost of providing temporary cover. Legal liability may arise from damage to property or injury to a third party, or may be due to the negligence of others. It will also cover liability under a contract for the failure of the facility to perform either because it is late or because it fails to meet its specification. Finally, there is the risk that members of the team may suffer injury arising directly from their work on the project.

Risk Management



2.3 Risk Management

Risk management is the process by which the likelihood of risk occurring or its impact on the project is reduced. It has five steps:

- 1- **Identify** the potential sources of risk on the project.
- 2- **Determine** their individual impact, and select those with a significant impact for further analysis.
- 3- **Assess** the overall impact of the significant risks.
- 4- **Determine** how the likelihood or impact of the risk can be reduced.
- 5- **Develop** and implement a plan for controlling the risks and achieving the reductions.

Identifying Risk

Where control of risk lies



2.3.1 Identifying Risk

One way of classifying risk is by where control of the risk lies. However, project managers must have the right mental attitude to risk, and expect risks where they are least expected. In that way, they will be better able to respond to risks as they occur. *They must also be aware that exposure to risk can vary throughout the project management life cycle.*

Classifying Risks

Five classifications according to where control lies

2.3.2 Classifying Risks

There are five classifications of risk according to where control lies:

- a) **External Unpredictable:** *These are risks beyond the control of managers or their organizations, and are totally unpredictable.* They can be listed, but we cannot say which will be encountered on a given project. They arise from the action of government, third parties, or acts of God or from failure to complete the project due to external influences. Government or regulatory intervention can relate to supply of raw materials or finished goods, environmental requirements design or production standards or pricing. Many projects have been killed by the unexpected requirement to hold a public enquiry into environmental impact. Whether a change of government at an

election falls in this or the following category is a moot point. Action of third parties can include sabotage or war, and acts of God are natural hazards such as an earthquake, flood, or the sinking of a ship. Failure to complete can arise from the failure of third parties to deliver supporting infrastructure of finance, or finance, or their failure through bankruptcy, or a totally inappropriate project design. By their nature, these risks are almost all "insurable risks."

- b) **External Predictable Uncertain:** *These risks are beyond the control of managers or their organizations. We expect to encounter them, but we do not know to what extent. There is usually data that allow us to determine a norm or average, but the actual impact can be above or below this norm. There are two major types of risk in this category: the first is the activity of markets for raw materials or finished goods, which determines prices, availability and demand; the second is fiscal policies affecting currency, inflation and taxation. However, they also include operational requirements such as maintenance, environmental factors such as the weather, and social impacts – all are business risks.*
- c) **Internal Technical:** *These risks arising directly from the technology of the project work of the design construction or operation of the facility or the design of the ultimate product. They can arise from changes or from a failure to achieve desired levels of performance. They can be "business" or "insurable risks" although in the latter case the risk is borne by the parent organization, not by an outside insurance company. (The premium paid is the investment in other products which far exceed expectations).*
- d) **Internal Non-Technical:** *These are risks within the control of project managers, or their organizations, and are non-technical in nature. They usually arise from a failure of the project organization or resources (human material or financial) to achieve their expected performance. They may result in schedule delays, cost over-runs or interruption to cash flow. These are usually "business" risks.*
- e) **Legal:** *Legal risks fall under civil and criminal law. Risks under civil law arise from contractual arrangements with clients, contractors or third parties, or from licenses, patent rights contractual failure or from force majeure (a unilateral claim by one party to a contract). Risks under the criminal law are duties imposed on both the owner and contractor. Under the Health and Safety at Work Act 1974, all employers - not just in the engineering industry - have a duty of care for their employees and for the public. Therefore, project managers, their employers (the contractors) and design teams can be held responsible if*

their negligence causes injury to any of the parties involved with the project; including: the project team while working on the project, users while operating the facility, and consumers using the product produced by the facility. There have been successful prosecutions in the engineering industry. With some of the modern uses of computer systems, programmers must be aware of the software errors leading to injury of a user or consumer.

Techniques for Identifying Risk

2.3.3 Techniques for Identifying Risk

There are five techniques for identifying risk. They are listed separately, but are in practice used interactively:



- 1- **Expert Judgment** uses personal intuition and awareness. This is the simplest technique, but is sufficient only on the simplest projects. The use of checklists against the categories identified above can help.
- 2- **Plan Decomposition** shows risks inherent in the interdependency of work. **Any event that lies at the start or completion of many activities is a potential risk.** These occur at bottlenecks in the network. When analyzing the plan, you should also look at all external interfaces such as external supply, for potential failure of third parties.
- 3- **Assumption analysis** is win/lose analysis and focuses on events that might be detrimental, considering both events we want to occur but may not and events we do not want to occur but may. Expert judgment is needed to foresee these events and check for completeness. Table 2.2 contains an assumption analysis on the purchase of a computer system.
- 4- **Decision drivers** are influences that might determine whether or not certain events may occur (inside and outside the project). **Win/lose analysis can be used to derive the list of decision drivers.** It can be particularly damaging if decisions are made for the wrong reason: political versus technical, marketing versus technical, solution versus problem, short term versus long term, new technology versus experience.
- 5- **Brainstorming** uses social interaction to enhance the above techniques

Expecting the Unexpected

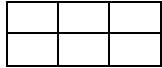
2.4 Expecting the Unexpected

The secret of clear risk identification is to be able to predict possible causes of divergence from plan. It is the experience of many people that failure occurs on a project where they least expect it. This is



known as **Sad's Law** or **Murphy's Law**. It is sometimes stated as: if something can go wrong it will; if something can't go wrong it will!

Table 2.2: Win/lose analysis for the purchase of a computer system



System offered vs. system specified	Winners	Losers
Quick cheap product	Developer Sponsor	User
Lots of nice to haves	Developer User	Sponsor
Driving too hard a bargain	Sponsor User	Developer

The value of this attitude is that if you expect things to go wrong you will be on your guard for problems, and will be able to respond quickly to them. The failures may be ones you had predicted or ones you least expect. If you anticipate problems, and plan appropriate contingency, you will not be disrupted when those problems occur. If the unexpected then also occurs, you will be able to focus your management effort into the areas that might now cause greatest disruption. This attitude of expecting risks and being ready to respond is sometimes known as *risk thinking*. To some people it comes naturally; others require structured, logical processes of risk identification and analysis to support their response.

Variation of Risk with the Project Management Life Cycle

Like quality the impact of risk varies throughout the project management life cycle.

2.5 Variation of Risk with the Project Management Life Cycle

Like quality the impact of risk varies throughout the project management life cycle. The later in the cycle risks occur, the more expensive are their consequences, but to counteract that, the less likely they are to occur. Risk can be reduced at the design stage by choosing a proven design rather than an untested one, or during the implementation stage by choosing proved methodologies. Whenever novelty is introduced the risk of failure grows throughout the life of the project.

Isolating Risk in the Work Breakdown Structure

2.6 Isolating Risk in the Work Breakdown Structure

Similarly, it is usually possible to isolate risk in the work breakdown structure by identifying it as being associated with a certain part of the project.