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Project Risk Analysis and Management Guide

The second edition of the *Project Risk Analysis and Management Guide* maintains the flavour of the original and the qualities that made the first edition so successful.

The new edition includes:

- the latest practices and approaches to risk management in projects;
- coverage of project risk in its broadest sense, as well as individual risk events;
- the use of risk management to address opportunities (uncertain events with a positive effect on the project's objectives);
- a comprehensive description of the tools and techniques required;
- new material on the human factors, organisational issues and the requirements of corporate governance;
- new chapters on the benefits of risk management and behavioural influences.

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Introduction

THE PURPOSE OF THE *GUIDE*

Risk is present in all projects whatever their nature, although some projects are inherently more 'risky' than others because of the nature of their task, the technology on which they are based, or the environment in which they are undertaken. A formal approach to risk management in projects is often demanded by customers or by the governance requirements of the organisation itself. As there are many possible approaches to risk management, and many tools and techniques to support these approaches, it is often difficult for the inexperienced project manager to determine which approach would be most appropriate to meet his project's needs.

The *PRAM Guide* describes a systematic and disciplined approach to controlling risk that can be used to help improve the success of projects. It sets out methods for the identification and recording of risks, highlighting the consequences and establishing appropriate management action. The *Guide* does not prescribe a system that project managers can adopt without careful thought; it will still be necessary to study other risk methods and techniques and to develop judgement through personal experience. Successful project managers know that they must develop an approach to each project that is appropriate for the purpose and which makes full use of the team's strengths and the inherent qualities of the project and its environment. It must also reflect the project manager's own individual style of management. There are, as always, no short-cuts to good management.

This latest edition of the *Guide* aims to assist project managers and risk practitioners by describing a range of approaches and techniques that are being used by their peers, and from which they may choose to suit their own particular circumstances.

This Introduction describes some of the issues and choices with respect to possible approaches and then goes on to outline the structure of the *Guide*.

APPROACHES TO RISK MANAGEMENT IN PROJECTS

A successfully managed project is one that achieves its stated objectives in the most effective manner possible. No project manager would attempt to run a project without giving the disciplines of quality management, planning and financial management detailed attention; the same is true of risk management. However, the benefits of risk management may be achieved in many ways.

Many project managers still see risk management as a rearguard action to protect the project from its own fears. In some cases, it is only applied superficially in order to comply with internal company rules or meet client expectations.

Simply managing to lowest cost – a typical scenario resulting from competitive fixed-price bids or unenlightened project sponsors – potentially leaves the project exposed to inherent risks. Identifying those risks and making mitigation plans in the form of alternative paths, action plans or 'a contingency fund' go some way towards dealing with the risk, but such an approach can be too reactive in that the mitigation plan is invoked only when the potential threat has become an issue, and opportunities (that is, risks with a positive impact) are not actively pursued.

If a project team is to be successful it cannot rely on the absence of problems but must predict and manage the inherent risks so that, when problems do occur, they can be overcome and, when opportunities arise, the benefits are maximised. A successful project manager is undoubtedly also a good risk manager who not only controls project risks to avoid 'management-by-crisis', but is also aware of opportunities and is ready to exploit them as they arise.

The effective management of risks will reduce the requirement for contingency planning, leading to more competitive bids, more profitable projects and more satisfied customers. This 'risk-efficient' approach acknowledges that proactive and judicious spending of some of the risk budget (time and/or cost) before risks occur offers the project manager the opportunity to exercise full management control over those potential events.

The net effect is to make the project far less susceptible to chance in that threats are rendered less critical in impact, or even eliminated altogether, and significant opportunities are actively pursued and realised. As a consequence, the project is less exposed to 'crisis' situations, and thus the project team is less stressed, more confident and is better able to apply its skills. The net result is a project that is more likely to succeed in achieving its stated objectives within agreed time and cost budgets and a customer who is more relaxed and happy.

Project risk analysis and management, as described in this *Guide*, is in many respects a formalisation of the common sense that project managers usually apply to their projects. It is not a new way of managing and need not require a significant change in the way a project manager thinks or behaves. It is a tool to assist in discharging project responsibilities effectively and in

ensuring the fulfilment of project objectives. Although project risk analysis and management has a clearly defined formal structure, it cannot be applied mechanically – it should not be seen as a 'painting by numbers' approach. Most experienced risk practitioners understand this, but formal statements of risk methodologies do not always make this important point clear. Creativity, lateral thinking and an understanding of the domain or environment in which the project is taking place are crucial to successful risk management.

Project risk analysis and management is often concerned with extremely complex risk issues, so a complex method is the last thing that is needed. Accordingly, the method described in this *Guide* has been kept as simple as possible, while nevertheless fully encompassing all the various methods and viewpoints known to the authors that contribute to the comprehensive analysis and management of risk. This means that this *Guide* does not knowingly exclude any approaches that are currently being used successfully.

At its most fundamental level, risk management is extremely simple. The risks (both threats and opportunities) are identified, a prediction is made on how likely they are and the extent of their impact, decisions are taken on what to do about them, and then those decisions are implemented. At a more complex level, overall risk outcomes (rather than individual risk events) are identified and strategies devised to manage these outcomes by, for instance, changing the project approach, solution, timescales, basis of contract or even the scope of the project. This increased complexity is generally rewarded by a significantly improved performance against objectives.

THE STRUCTURE OF THIS *GUIDE*

Following the Introduction, Chapter 2 'Benefits' shows how a formal approach to risk management helps directly and indirectly to improve the likelihood that a project will be successful.

Chapter 3, 'Principles' offers a high-level definition of the recommended approach to managing risk and introduces the fundamental principles and concepts on which the rest of the *Guide* is based. It also provides a summary of the risk management process, which is expanded in Chapter 4.

Chapter 4, 'The PRAM Process' takes the reader through a number of iterations of the process, demonstrating the changing emphasis as the project progresses and better information becomes available. The approaches described here have all been experienced by members of the APM Risk SIG. Few implementations of risk management need to specifically address every phase and action as presented in this chapter although, to varying degrees, every aspect is present in successful risk management.

Having established the principles and described the process in detail, the *Guide* turns to implementation. Chapter 5, 'Organisation and Control', examines risk management in the context of the project's management and describes how to govern and control risk management activities on the project.

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The PRAM process

This chapter explains why a risk management process is important, the main features of the PRAM 1997 process and some key developments and changes for the PRAM 2004 process.

INTRODUCTION

In this chapter we will describe the PRAM process in generic terms, using the phase and sub-phase structure provided in Chapter 3 and summarised in Figure 4.1.

A process is a road map for formalising planning. Metaphorically speaking, a good generic process is a set of maps covering all possible journeys, with guidance on how to select the map and then the route appropriate for a particular trip. Good maps, and the ability to use them effectively, are vital in unknown territory, and they remain useful until the territory involved is understood in the same way by everyone concerned with planning a journey.

Table 4.1 shows how PRAM 2004 has improved on, and developed from, PRAM 1997. Some of the points in the table may seem complicated to first-time users of project risk management processes. However, a key feature of PRAM 2004 is that it facilitates movement from a simple starting position and process to the most effective best-practice processes. It is important to understand, at least in outline, what best practice looks like before introducing project risk management or improving existing practices. The process itself must facilitate learning, moving from current practice towards better practice, which PRAM 2004 is designed to do in a more focused way than PRAM 1997.

A HYPOTHETICAL SITUATION FOR INITIAL DISCUSSION

As Chapter 3 indicated, it is important to initiate a project risk management process as early as possible in the project life cycle and apply the process regularly as the project evolves, adjusting it to suit the project's life-cycle

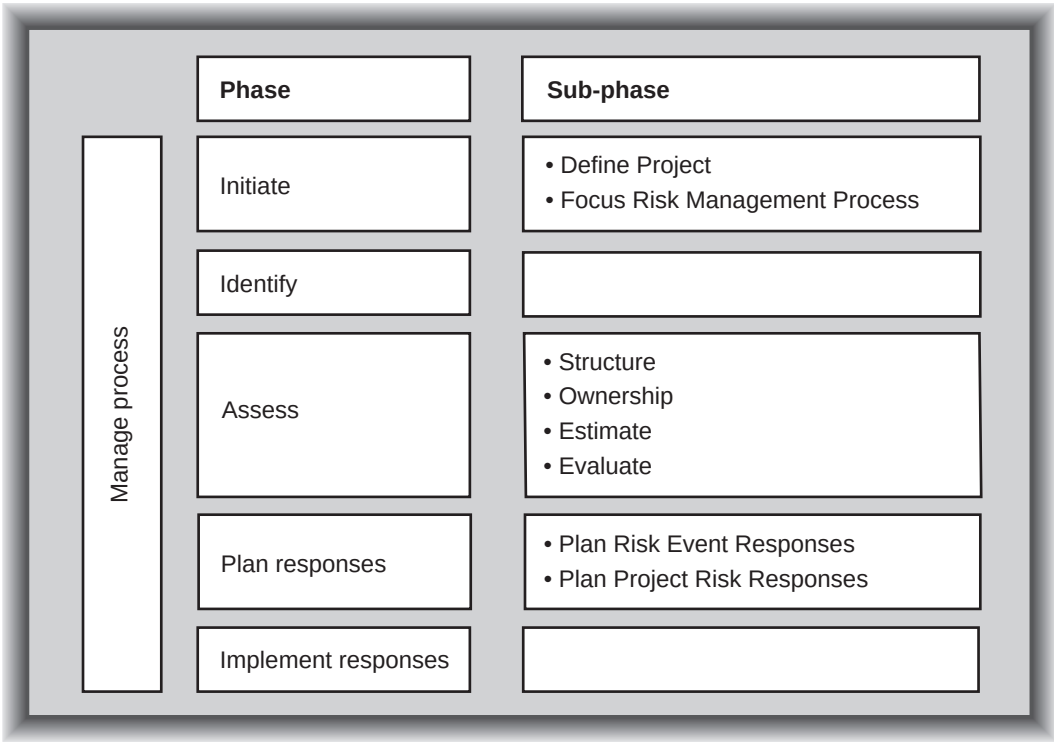

Figure 4.1 *Risk management phase and sub-phase structure*

position at each application. To describe the process in any detail there needs to be clarity as to which stage is being discussed. For present purposes a five-stage project life cycle, as detailed in section 5 of BS 6079–1, will be used:

1 **Conception** – covering the period from the emergence of an idea for a project to an initial formal statement of a user's or sponsor's needs
2 **Feasibility** – establishing both the technical and commercial viability of the project
3 **Implementation** – undertaking the project
4 **Operation** – using deliverables from the project for their intended purposes
5 **Termination** – closing down the project.

Organisations commonly introduce a project risk management process towards the end of the feasibility stage, and this is also the easiest point at which to explain what is involved. Hence, it is assumed that the project is approaching the end of the feasibility stage, with well developed strategic plans, and is about to seek sanction to proceed.

Two other issues are best dealt with by assuming a particular situation. First, the extent and the nature of previous applications of risk management processes should influence subsequent applications. Second, a contractor can

Table 4.1 *Comparison of process between PRAM 1997 and PRAM 2004*

	PRAM 1997	PRAM 2004
Initiate phase	Most project risk management processes have an Initiate phase, that part of the process concerned with getting started. A unique feature of the PRAM Initiate phase is the guidance provided (in the Focus sub-phase) on how to adapt the generic process to the project of immediate concern, choosing the best map for the purpose in hand and reading it effectively.	
Identify phase	Most risk management processes start the analysis proper with an Identify phase, concerned with identification of sources of uncertainty that threats. Some also consider opportunities. A key feature of PRAM is the effective linkage of threats and opportunities to responses specific to particular issues plus 'general' responses which deal with sets of issues and build in the flexibility to deal with unanticipated threats and opportunities.	This linkage has been further developed in this edition, by adopting a second definition of risk ('project risk' as well as 'risk events'), which facilitates a search for 'best' approaches to a project, as distinct from just 'good enough'.
Assess phase	Most approaches to project risk management have an Assess phase involving qualitative (PI matrix) and quantitative (probabilistic) estimation. PRAM does this in a way which allows the overall process shape to reflect a focus on either a qualitative or quantitative estimation, or an intermediate position. In particular, if the focus is entry-level analysis based on a PI approach, it is natural and normal to consider response generation after an Assess phase, but if the focus is effective probabilistic analysis, the sequence has to be reversed. In the context of an iterative process the sequence matters less, but it still matters.	A key feature of PRAM is its iterative nature. One-pass processes are inherently inefficient, because some issues receive too much attention, and others not enough. The aim of an iterative process is to apply 80 per cent of time to the 20 per cent of the issues that matter most. The feedback loop structure discussion in this edition has been further developed to clarify what is involved.
Plan phase	This is concerned with detailed planning for implementation after initial use of the PRAM process at a strategic planning level.	This edition gives separate consideration to these two very different planning issues within the Plan phase, emphasising the difference between specific and general response planning and thus dealing with specific risk events and overall project risk.
Manage phase [PRAM 2004–Implement]	This is concerned with managing both risk in the project and the risk process itself.	This edition considers these different aspects of management by specifying a Manage Process activity to embody the management of the process and an Implement Responses phase to emphasise the need to ensure that the planned responses are carried out.

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Behavioural Influences

This chapter describes behavioural influences in a risk context, along with a variety of possible interpersonal approaches and some areas of particular concern to the risk manager and risk specialists.

INTRODUCTION

The behaviour of the involved individuals will have an impact throughout project risk management and will contribute directly to its success or failure. The project manager, the risk specialist, the project team, the client, the end user, the supplier – and, indeed, the whole supply chain – will influence identification, analysis, planning, decisions and action.

Each of these individuals, working alone or in groups, will have a unique interpretation of, and behaviour towards, risks. Every person has a unique personality, set of experiences and set of circumstances. Their behaviour – their reaction to this concoction – will be unique. Hence, what one person may identify, quantify and manage as a risk, the next may react to in a very different way. He or she may not even recognise the future event, may not consider it important or probable, or may decide to act/manage the situation differently.

The project manager should bear in mind that:

(a) the input to the project risk management process arises from the opinions of individual human beings

and

(b) much of the variances in performance in project risk management arises from the different views that people have when they identify and respond to risk.

Project managers and risk specialists will require not just the methods and techniques of project risk management but also effective people skills if they are to achieve their objectives of a project completed in time, to budget and

to the required specification. No amount of 'applied guide', risk or otherwise, will work without these skills.

People skills may be inherent in our make up or they may be developed through processes of learning. The material presented here is aimed at giving practitioners a glimpse of some of the complex issues they may encounter. They are based on practical experiences of the contributors, and it is hoped that the information will help identify areas of potential ambiguity and complexity, leading to more sensitive and successful project risk management.

The main section of this chapter introduces the influences on an individual's behaviour and specifically his or her behaviour towards risks. The second section outlines a collection of individual interpersonal approaches which have been successfully employed to assist the risk manager with the planning and execution of project risk management. The final main section identifies four areas of particular concern: relationships with the risk specialists; risk transfer and allocation from customer to supplier; teamwork at enterprise level; and estimates and forecasting.

INFLUENCES ON BEHAVIOUR

The study of human behaviour cannot be distilled into one single chapter; more in-depth information can be obtained from the literature on organisational behaviour. However, there are important elements that influence behaviour towards risks, and these can usefully be discussed here.

Simply, as illustrated by Figure 6.1, human behaviour may be described as the result of a complex interaction between two distinct elements:

- the person themselves (perception, attitude, personality, motivation)
- the situation – both macro and micro environments (for example, the politics, the economics and the group/team, organisation).

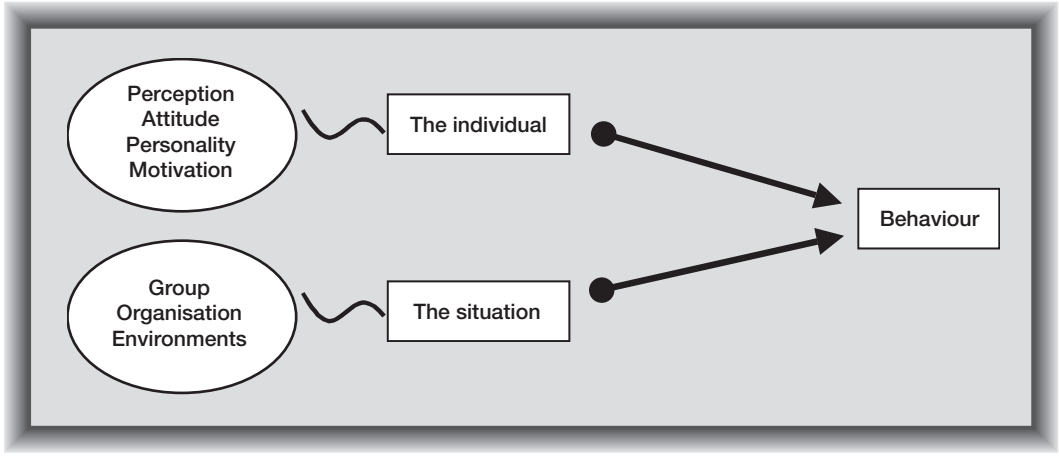

Figure 6.1 *A description of human behaviour*

Added to this is the further complication of time. Any or all of the elements described above may change today, tomorrow or in six months' time.

In an attempt to understand the uniqueness of an individual's behaviour, a brief explanation of these elements is offered below.

The constituents of the individual

Perception

Perception of risk is derived from a comparative view. An individual will select, reject and compare information against experience, and will tend to consider a risk event as either greater or less than another risk event. The individual's perception of risk is a composite of true uncertainty and lack of comparative knowledge.

In the context of project risk management this may manifest itself in several ways:

- 'Specialists' in a particular domain may perceive risks as being far greater in other domains with which they are less familiar. This may cause specialists to understate risks within their own domain and to over-emphasise other risks.
- Conversely, the 'specialist' closest to a potential risk may acknowledge the full measure of that risk, or even augment it, because of previous experiences. He or she may go on to deemphasise, or perhaps even reject, other potential risks as no previous connections have been made.
- However, the 'specialist' closest to the risk is the one most able to assess risk on the basis of true uncertainty, and the 'specialist' from another domain is most likely to overstate the risk due to lack of knowledge influenced by conjecture, hearsay and unsubstantiated opinion.
- Alternatively, a 'specialist' may trivialise or ignore risks suggested by someone outside his or her domain because this external opinion may be perceived as invalid.

Individual perceptions can lead to the denial of risks and a delay in managing them. Thus, there is a danger that a risk will be suppressed or, conversely, that an inflated risk will achieve undeserved credibility. As a result, the gap between perceived risk and actual risk will increase, with the potential for unforeseen risks to materialise with concomitant serious consequences for the project outcome.

Attitude

Attitude describes the persistent tendency to feel and behave in a particular way. Influenced by emotions, information and previous behaviour, it is different yet linked to belief (reality as it is understood), values (what is desirable) and motivation (rewards and protection of the ego). There are core attitudes which are resistant to change and peripheral attitudes which may

The Association for Project Management's Project Risk Management Specific Interest Group was formed to provide a forum for debate and for the development of expertise in risk management. The Project Risk SIG's mission statement is:

"We aim to provide an environment which enables those involved in project management, from any industry, to develop a full understanding of risk management principles and techniques, and the benefits from their use. We aim to be a leader in the field of risk management, and to provide databases of risk-related information, training and methods".

Project Risk Analysis and Management Guide

Risk is present in all project work, whatever the nature of the project, or the environment in which it is undertaken. The Project Risk Analysis and Management Guide second edition, focuses on the issues that affect the project manager. It focuses on project specific issues and addresses how the risk management process at project level connects to corporate or programme level risk management.

The *Project Risk Analysis and Management Guide* offers a systematic and disciplined approach to managing and controlling risk in projects. The PRAM process is not, however, prescriptive. Successful project managers will know that they must select the tools and techniques appropriate to their situation and develop an approach that is fit for purpose and uses the strengths of the team and the inherent qualities of the project and its environment.

Whatever your professional role, be it that of a manager, client, contractor, sub-contractor, consultant or supplier, and in whatever sector of industry, including the service sector, traditional technology-based industries, and those managing organisational change programmes, the *Project Risk Analysis and Management Guide* provides an authoritative and concise reference.

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