

# Using Project Risk Management Process in Investment Appraisal

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**Abstract** In this paper five widely used approaches of project risk management will be presented and compared: the Australian and New Zealand AS/NZS 4360 standard, Project Management Institute's Project Management Body of Knowledge (PMBOK), UK Association for Project Management Project Risk Analysis and Management (PRAM) guide, UK Office of Government Commerce Management of Risk (M\_o\_R) guideline, and the authors Chapman and Ward proposed Shape, Harness, And Manage Project Uncertainty (SHAMPU) project risk management processes.

**Keywords** – project valuation, risk, opportunity, and project risk management process.

## I. INTRODUCTION

In a project context, risk is the chance of something happening that will have an impact upon the objectives of the project. It includes the possibility of loss or gain, or the variation from a anxiety or planned outcome, as a result of the uncertainty associated with the particular actions [9]. Much project risk management focuses on the risks of uncertainty, but the opportunities as a positive result of uncertainty could be important and provide needed benefits and improve project results. It is important for managers to recognize the threats and opportunities in time and respond quickly enough to catch

them exploiting the associated benefits and decreasing or mitigating associated threats.

Many authors (for example, Chapman and Ward, 2003; Cooper *et. al.*, 2005; PMBOK, 2004) for project risk management propose to use project risk management process by which risk management process (RMP) is spitted to separate steps where information related with project uncertainty is evaluated systematically, there are response actions to decrease or mitigate threats, risks are monitored and controlled throughout project lifecycle. Project risk management enable managers to effectively manage the risk related information [8]. Many government institutions or authors promote best practice project management standards, which showed the effectiveness and recognition between various companies and public corporations. These selected and most widely used project risk management processes as the Australian and New Zealand AS/NZS 4360 standard [2], Project Management Institute's *Project Management Body of Knowledge* [9]; the UK Association for Project Management *Project Risk Analysis and Management (PRAM) Guide* [1], and the UK Office of Government Commerce *Management of Risk (M\_o\_R) guideline* [10] are compared below, where the common phases are showed in Fig. 1.

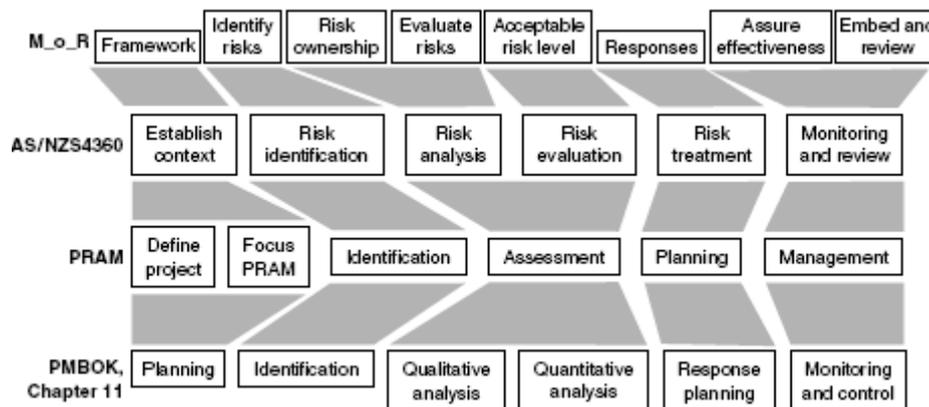


Fig. 1. Project risk management processes comparison [6]

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The basic structure of these processes is similar. Despite the difference of stages definition, the selected project risk management processes can be subdivided into five major stages: planning, identification, analysis, response, and monitoring and control. First, a project manager can apply risk management planning to define needed activities, approach for risks. Second, risk identification allows project managers to find out risks, which may affect the objectives [9].

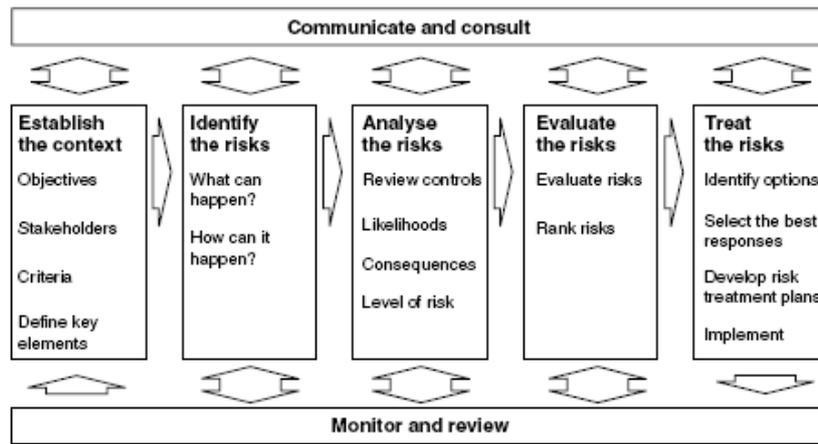


Fig. 2. AS / NZS 4360 risk management process [6]

Third, by using risk analysis a project manager evaluates quantitatively or qualitatively the likelihood of occurrence and likely consequences of risks [11]. Fourth, risk response helps a project manager to develop procedures and techniques to mitigate the defined risks [3]. Fifth, risk monitoring and control enables the project manager to control known risks and to identify the new ones during the implementation of the project [9].

## II. A REVIEW OF PROCESSES

Each of these processes propose a wide-range opportunities to manage risks, but they are related with significant differences by analysing use of objectives and approaches. So, it is worth to describe and detail each of them.

### AS / NZS 4360 risk management process

This risk management process was published in Australia and New Zealand, later updated in 1999 and 2004 year. It is a common risk management standard that is applied to project risk management and Cooper *et. al.* (2005) described the basis for the use of processes in projects (see fig. 2). The standard describes an overall approach and deals with risk management process (daily actions, treatments) and strategic direction. It

can be used as the basis of the programme or business risk management process as a portfolio of projects [6]. The process is a generic approach, so the standard does not describe project-specific issues, so the authors in the book developed in detailed how to use it as a project risk management process. The main features of the AS / NZS 4360 risk management process could be described as follows [6]:

1. This process evaluates risks individually, except where common factors are identified that link risks or offer opportunities for strategic initiatives that address several risks at once.
2. It is often applied with qualitative evaluation, although quantitative likelihood and consequence measures also can be used.
3. It can be highly structured and it is easy to support with data management tools.
4. The process is scalable to suit the size and complexity.

### PMBOK („project management body of knowledge“) risk management process

This risk management process is written by authors of the “Project Management Institute, PMI” and is used specifically for project risk management (see fig. 3). It is structured in a framework of inputs, tools and techniques, and outputs.



Fig. 3. PMBOK project risk management process [9]

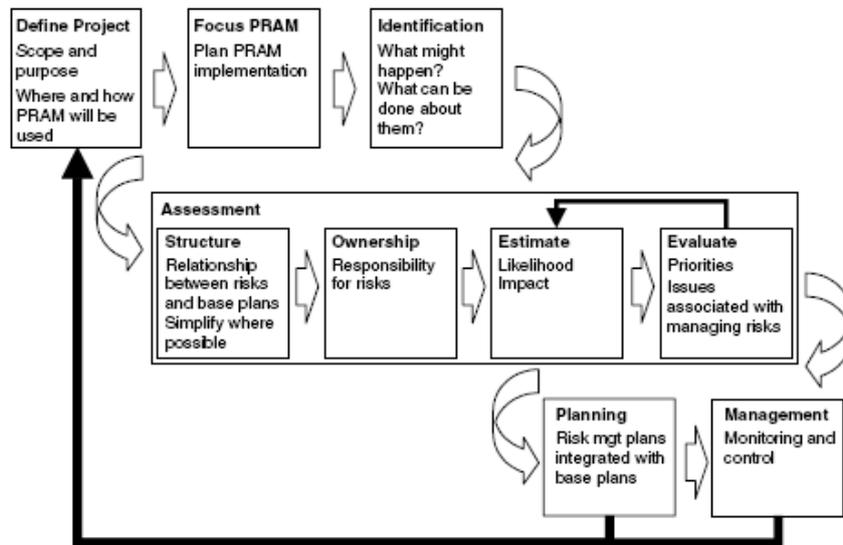


Fig. 4. PRAM guide risk management process [6]

The process deals with management responsibility for the risk management and links to the wider project management process contained in the rest of the PMBOK book [9].

The details of risk management itself are not very clear, but PMBOK includes detailed qualitative and quantitative risk analysis methods but don't link them directly. The approach has lot complex project operations, but it is easy adopted for project risk management. Some important features could be separated of the process [6]:

1. Process steps are primarily management process structures.
2. Many analysis techniques are described with the use and references are made to others.
3. They encompass the use of qualitative scales, decision trees, influence diagramming, sensitivity analysis and Monte Carlo simulation.
4. Risk evaluation is addressed both individual risks issues and the risk in a project as a whole.

The process is scalable to suit the size and complexity of any project and it is easy to follow [4].

**PRAM („project risk analysis and management“) guide**

The *PRAM Guide* is a project risk management guide which separates the risk management from used techniques and methods that could be used at various stages in the process.

There are nine stages in PRAM guide (figure 4 illustrates the key stages of the process).

Khamooshi (2004) accentuate that the process “allows plans to be formulated more realistically by giving a better in depth understanding of impact of risks on the project, facilitating greater but more rational risk” [7]. The PRAM process is written within a project management structure and deals with the phases and needed responsibilities for managing the process. This process provides examples of techniques and methods for the individual process steps [6]. The core of the material is also well structured and easy to follow.

**M\_o\_R („Management of risk“) risk management process**

The *Management of Risk* guide is known as M\_o\_R and written for public sector organizations. The process helps to deal with all risks to an organization's success and includes guide on the risk management process, management structure, roles and responsibilities, and checklists to assist in various stages of the process. M\_o\_R discusses the risk management from the strategic level, including corporate governance, it follows projects and operations. The guideline separates a general risk management process from its implementation in strategic, programme, project and operational contexts, and from tools and methods that might be used to execute a part of the project risk management process (see fig. 5).

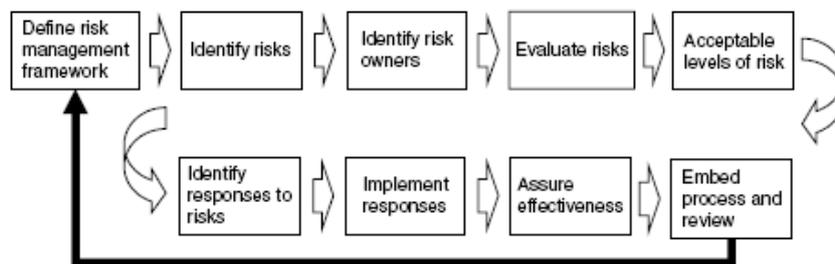


Fig. 5. M\_o\_R risk management process [6]

The following important features can be separated [6]:

1. This guide is applicable widely but it is targeted at and described in terms of public sector organizations.
2. Some analysis techniques are described; also there are references to related OGC publications.
3. The methods are described separately from the risk management process.
4. The recommended methods include some that deal with individual risks and the others, which could be used to understand the common risk to a project as a whole.
5. In the guide the organization is analyzed, where risk management is being applied to achieve the objectives of that organization.

So, after review of the project risk management processes we could see, that there are many methodic differences in determining names of the steps, proposed tools, techniques, and allocating needed works in course, but the purposes of the processes are similar. Hilson (2001) also notes that the commonly used risk standards and guidelines have similar sets of strategies with minor variations in terminology [3].

Chapman and Ward (2003) compare PMBOK project risk management process with the one, which names *SHAMPU* („*Shape, Harness, And Manage Project Uncertainty*“) [5]:

TABLE I  
A COMPARISON BETWEEN SHAMPU AND PMBOK PROJECT RISK MANAGEMENT PROCESSES

SHAMPU process steps	PMBOK process steps
Define the project Focus the process	Risk Management Planning
Identify the issues Structure the issues Clarify ownership Estimate variability Evaluate implications	Risk Identification  Qualitative Risk Analysis Quantitative Risk Analysis Risk Response Planning
Harness the plans Manage implementation	Risk Monitoring and Control

Table 1 is useful to compare the approaches, by evaluating that the compatible boundaries between phases are indicated by the two solid lines, which divides the first two and the last two SHAMPU phases from the rest ones. Chapman and Ward (2003) accentuate the following main differences between the PMBOK and SHAMPU processes [5]:

- First, the inputs, tools and techniques, outputs structure in PMBOK for each step is replaced by the purposes, outputs, and tasks structure.
- The second difference is related with the absence of a harness phase. The *Risk Response Planning* phase in the PMBOK Guide is not related with strategic plans, but with tactical plans for implementation within an action horizon, which for authors means no distinction between tactical and strategic level planning.
- The third important difference is related with late location of the *Risk Response Planning* phase in the PMBOK process description. The tasks associated with this phase are placed in the context of what is presented as a linear

process and it could be particularly ineffective to leave this risk response planning so late.

- The fourth difference is that the PMBOK *Qualitative Risk Analysis* is not interpreted in the SHAMPU qualitative analysis sense. The *Quantitative Risk Analysis* step is not interpreted in the SHAMPU quantitative analysis sense.

### III. CONCLUSION AND SUMMARY

The risk management processes, promoted by professional organizations and public states have an important role in the development the best practice. They show to managers how to practise experience and what is the best practice approaches for managing a project effectively.

The presented approaches are similar in common but they also differ in some areas, have different preferred tools and techniques. It is important to understand what is similar and what differ in objectives, process and terminology in order to apply them effectively for needed purposes of a project. It is also important to understand well the needs of an enterprise, used concepts, organizational culture by implementing the projects in order to select a needed risk management process.

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