

JEREMIE AVEROUS

Practical
Project Risk
Handbook
for
Project Managers



*A Guide to
Enhance Opportunities
And Manage Risks
on Large, Complex Projects*



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"It is still an unending source of surprise for me how a few scribbles on a blackboard or on a piece of paper can change the course of human affairs" – Stanislaw Ulam, mathematician, inventor of the modern Monte Carlo method.

This Handbook is dedicated to those who change the course of Projects scribbling about Opportunities and Risks, defying the odds and delivering Large, Complex Projects.

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Foreword

There used to be a maxim among the project management and contracting community according to which “*there is no such a thing as a duplicate*”. It meant that, even if two projects looked identical, you could rely on your client as well as on your own engineers to introduce well meant ‘improvements’ which, in fact, destroyed most of the synergies you might have expected!

It is this uniqueness of each project compared to the next or previous one which differentiates project activities from manufacturing and mass production.

The consequences are obvious in the field of risk management: one cannot any longer trust the law of large numbers and casually use probabilities derived from past experience.

This is precisely the general argument of Jeremie Averous’ book: managing risks in large projects calls for specific techniques and one should rely on common sense, imagination and intuition rather than on mathematical models.

The developments on the Monte Carlo method may depart from conventional wisdom and shock some pundits, but they should nevertheless be compulsory reading for every Project Manager and Project Controller. Jeremie debunks widely accepted myths by calling attention to the limitations of the tool and warning against taking its results at face value... which is unfortunately common practice in many organisations.

The most stimulating part of the book is undoubtedly the chapter about project failure. This is a subject rarely discussed in literature in spite of the fact that two thirds of projects come short of initial expectations by a wide margin.

Having been faced many times with such situations during my professional life I can attest the soundness of what Jeremie advises about fighting denial, cutting losses before it is too late, removing or not removing the Project Manager, involving external reviewers from the start...

If this unprecedented little book had to be condensed in a single sentence it could be: "*when managing a project you have to expect the unexpected and this is the way to be prepared for it*". Page after page it is filled with practical recommendations directly drawn from the author's involvement in contracting activities and the day to day management of large industrial projects.

I am convinced that the proportion of disappointing projects can be greatly reduced by a systematic use of this comprehensive set of tools and I hope that well thumbed through copies of Jeremie's book will soon be displayed on the desk of every Project Manager and Controller.

Jean-Pierre Capron

December 2014

Former COO, Technip

Former Managing Director, Acergy

Preface

I feel that it is my duty to mention to the reader of this handbook that some concepts exposed herein can be considered to be unconventional, and even maybe controversial, to the practitioner of ‘classical’ Project Opportunity and Risk Management – although from my perspective, proven to be more effective than the usual way this process is implemented.

The material of this book has been used for multiple presentations and trainings in a number of leading Project-driven organizations, and those ideas that have sometimes been deemed controversial include in particular:

- The strong emphasis on substantial prioritization and effort focus in qualitative risk management (risk register management) – which means only monitoring the low risk items to concentrate actions and energy on higher risk items,
- The underlining of the importance of portfolio-level risk management, in particular when there are substantial common resources that are used across Projects. Most Project-driven organizations do not have a structured approach in that respect and rely on day-to-day management decisions, while this aspects can be decisive from the organization’s sustainability perspective,
- The description of the limits of the quantitative, Monte-Carlo based methods compared to real life (justified by the mathematics of the approach), and the fact that excessive dissection and interpretation of these results are at best ineffective, at worst misleading,
- The suggested focus on the prevention of risks of low probability and major consequences, which need to be subject to different risk prevention methods,

- Conversely, the insistence to protect the organization against the risk of dramatic project failure by systematically including contractual mechanisms to limit major risks (allowing to cut losses),
- The need to provide sufficient reserves organization-wide to protect Projects and the organization as a whole,
- The psychological side of Project Risk Management in particular in Projects that are failing.

The introduction of Project Opportunity and Risk Management in most Project-driven organizations at the end of the 1990s has led to a substantial improvement in the foresight in terms of Project risks, in particular for lump-sum Projects. Still, the relevant processes are too often, in my opinion, not effective enough and do not sufficiently support the Project Manager and the organization as a whole during Tendering and Project execution. In particular, Risk Analysts or Risk Engineers are often very junior and it is not yet a profession with a substantial career path, thus creating a significant turn-over. In summary, significant resources are sometimes spent in Project-driven organizations with insufficient results and return-on-investment.

It is my firm belief that Project Opportunity and Risk Management should be one of the key processes at the centre of Project and Project portfolio execution. While the process is well established now in most Project-driven organizations, it remains too often a bureaucratic exercise and still requires substantial improvement to really deliver the impact to the business that is intended. It is my expectation that this handbook will give the Project Risk community and the Project-driven organizations' decision-makers sound insights about the reforms that are required to make the process significantly more impactful and contributing better to the organization's long term sustainable business results.

Jeremie Averous

Singapore, January 2015

Introduction to Project Opportunities and Risk Management

Why undertake Opportunity and Risk Management?



A Project is like an intercontinental sailing navigation. When executing a Project, one needs to define the goal and a plan to reach it; and then, fit out a vessel with the appropriate quantities of fuel and supplies to last for the long voyage, and finally, recruit the right crew.

As in all human endeavours, there are always significant uncertainties when it comes to future events. This has to be taken into account at the planning stage, taking on board the right level of additional resources, provisions and fuel to cater at least for the most possible events.

Contingency reserves are always accounted for even for well-predictable voyages such as modern commercial navigation and flights. However, contrary to those voyages that are routinely repeated, which gives over time a good feel of what is the level of contingency reserve that allows to overcome most likely uncertainties, Projects are like exploration voyages, one-off endeavours. Specific approaches must then be developed and applied that cannot rely simply on the observation, statistical analysis

and extrapolation of the past. A more encompassing approach needs to be implemented.

As part of the basics of ship navigation, one learns what to do when a cyclone comes up on the intended route: in



the northern hemisphere, you need to steer to the left to the 'navigable quadrant'; if you steer to your right into the 'dangerous quadrant', you are doomed to encounter much rougher conditions and including maybe having to go through the full storm like in Joseph Conrad's famous book

'Typhoon'. Project Opportunity and Risk management is about embarking sufficient reserves, and then scanning the Project environment to detect whether unexpected serious conditions are developing, so as to take the right steering decisions based on proven rules and heuristics.

Formalized Opportunity and Risk Management processes have been gradually implemented throughout Project organizations during the 1990s and early 2000s to provide an answer to two basic and somewhat contradictory needs:

- Protect the organization against the most obvious risks and exploit better obvious opportunities; and protect the organization against most Project performance issues by including relevant contingency reserves in budgets and schedules,
- Still maintain competitiveness and economic attractiveness by implementing reasonable actions and methods that would calculate reasonable and not excessive contingency (both in time and cost).

In effect, Opportunity and Risk Management always has to strike a balance between protection and reasonableness/competitiveness.

Almost standard processes and tools have been introduced that are now widely used throughout the industry. However, we find often that they are not really

fully understood by Project Managers that do not benefit enough from the wealth of information they could provide. Many Project organizations do spend significant amounts of money and energy getting their Opportunities and Risks Management processes going, as mandated by top management and Board of Directors, and indeed waste most of this effort as it does not benefit to Projects as much as it should. Since Opportunity and Risk management processes are now made mandatory in particular for listed companies, it would be clever to ensure that these resources which have to be spent do produce an effective positive result for the organization in terms of competitiveness.

It is the ambition of this handbook to re-establish the basics of Project Opportunity and Risk management for Project Managers. A sufficient understanding of the issues at stake are needed for Project Managers to adopt and challenge the work of specialized Risk Engineers, and draw the most value out of the efforts undertaken in the field of risk management.

A practical handbook

This handbook has been specifically written in the particular context of Large and Complex construction Projects.

This handbook does not intend to be a 'starters' guide to Project Opportunity and Risk Management as it tackles relatively advanced topics. It does not cover, in particular, the full basic technicalities of quantitative risk analysis, but concentrates on the perspective of Project Management usage of Opportunity and Risk Management as a decision-making tool, and as a tool to ignite useful conversations in the Project team.

Our expectation is that well worn-out copies of this handbook will be found on every Risk Engineer's, Project Control Manager's, Project Manager's and Project Portfolio Manager's desk.

The handbook's structure

Chapter 1 covers some basic concepts related to Opportunity and Risk management. Chapter 2 then exposes overall key Golden Rules for that process, which will be detailed in further Chapters.

Chapter 3 describes how Project Portfolio Opportunities and Risks should be managed. Most Project-driven organizations unfortunately do not have a formal process at that level. The Chapter gives detailed insights into adequate approaches.

Chapter 4 then describes how Opportunities and Risks are managed throughout the entire Project lifecycle for a single Project, starting from the Project preparation / tendering stage: the earlier an Opportunity or a Risk is tackled, the more effective the intervention.

Chapter 5 to 7 describe the basic Opportunity and Risk Management methods: Chapter 5 describes the qualitative method of identification and ranking; Chapter 6 describes the cost contingency calculation methods and Chapter 7 deals with Schedule Statistical Analysis.

Chapter 8 explains how to deal with low probability, high consequence catastrophic risks (sometimes called '*black swans*'). They require specific methods that can be encompassed under the general heading of '*industrial risk management*'.

Chapter 9 takes a higher level view to discuss the real life issues that face Project execution and why Projects actually fail so often. The Chapter also addresses in particular some psychological aspects that need to be taken into account by the organization's senior management.

Finally, Chapter 10 summarizes how to assess effectively the quality of Project Opportunity and Risk management as applied overall in a project-driven organization or in a single project. The Chapter contains a number of easy-to-use reference checklists for project reviews and forensics.

Introducing ORSIPARM

The acronym ORSIPARM will be used throughout this handbook as a mnemonic device to describe the Project Opportunity and Risk process, and as a constant reminder of its key messages: the acronym stands for Opportunities & Risks – Scanning – Identification – Prioritization – Action – Reserves – Monitoring, in short ORSIPARM.

- We write in this book consciously about “**Opportunities & Risks**” (OR), and not the more usual “Risks & Opportunities”, as a reminder that when it comes to brainstorming, or just life decisions, psychological rules dictate that Opportunities be brainstormed and considered first.
- **Scanning** constantly the Project environment for getting a good picture of the situation, and changes or evidence of an upcoming storm;
- The effectiveness of any Opportunity & Risk management process then relies on a three-step process:
 - Widest possible **Identification** of Opportunities and Risks in the environment of the Project; both to verbalize what we observe and to increase the universe of ‘Known-Unknowns’,
 - Subsequent ruthless **Prioritization**, with the aim to diminish the number of top priority Opportunities and Risks to a manageable number,
 - Definition of a limited number of **Actions** that will really be implemented and tracked – which is the ultimate objective of the process.
- To deal both with ‘Known-Unknowns’ and most ‘Unknown-Unknowns’, in the face of complexity, the Project needs to keep **Reserves** available (cost contingency and schedule float) (Chapter 6) at a proper level to effectively protect the project (and not just respond to mandated reporting requirements). The ‘R’ can also be a reminder for **Resilience** against unexpected events, which is the prime characteristic that should be sought when planning the execution of a project (ref. Chapter 7).

- **Monitoring** all those Opportunities and Risks we have already identified but not considered a priority to check they do not change to become critical.

Using this acronym aims at reminding readers that all these different steps are critical in establishing an Opportunity and Risk management process that really works for the benefit of the Project and of the organization.

Topics not covered in this handbook

This handbook is aimed at the practice of Project Opportunity and Risk management during Project execution. The following topics are not covered in this handbook:

- Enterprise-wide risk management, beyond Project portfolio risk management (this would include such issues like financing risks, shareholder risks, strategic risks, obsolescence risks etc.),
- Health, Safety and Environment risk management, including associated national and international regulations.

Who is this handbook for?

This handbook is explicitly for Senior Executives of Project-driven organizations, Project Sponsors and Directors of Projects, Project Managers, Project Controls personnel and all those that aspire to become Project Managers; budget owners within Projects (package managers, etc.) as well as functional managers that are involved in Project Opportunity and Risk Management.

Risk Officers and persons involved in Enterprise Risk Management at corporate level of Project-driven organizations will also find the book useful to understand the specific issues and approaches related to Project activities.

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