Preface

Companies face increasing challenges due to the business environment dynamic ask for the application of structured approaches in designing, planning, scheduling and governing their projects. Projects are uncertain and risky endeavours. Firms apply projects as temporary organizations and empower project directors, project managers and project teams to manage projects and their risks.

Based on a strong practical orientation and multi-industries coverage, the book assist readers to better understand the challenges of the project risk management in the context of rapid changes of the business environment.

From different backgrounds and nationalities, the authors in this book discuss project risk management in a classical approach and in the novel trends.

Following a holistic understanding of projects, different perspectives such as a financial and a social perspective are of relevance in contemporary project management, particularly in project risk management, which is the topic of this book. From a financial perspective, projects are typically confronted with delays and additional costs, which reduce the company’s profit and even can lead to its bankruptcy. From a social perspective, projects are confronted with changing and often contradicting expectations of its stakeholders, which can lead to the stop of a project or to unacceptable project outcomes for users and other relevant parties.

We joined together as an international team of academics, who are interested in theory as well as in practical advances and in the co-creation of knowledge between practitioners and academics. By that we ensure the theoretical grounding and the practical relevance. We compiled this book with the intention to offer the reader a great variety of approaches and perspectives. The purpose of the book is to provide an overview of traditional and novel approaches to project risk management. We cover traditional topics such as financial risk management and methods such as Monte Carlo analysis. However, we also cover novel approaches to consider sustainability in project risk management and next practices such as systemic constellation for risk identification.

CLASSIC APPROACHES AND PRACTICAL CHALLENGES

Risk management can provide a solid basis for decision-making in projects and bring important benefits, such as reduced costs, increased engagement with stakeholders and better change management. Different approaches to project risk management are defined by industry standards and guidelines. Efficient risk management lays in the ability to quantify the elements of risk. The project quantitative risk analysis is
usually considered to be the hardest part of risk management, mainly because it is based on advanced statistics and mathematical methods. A deterministic approach to project management that has preset parameters of time and cost and in which decisions are taken based on the independent analyses of time or cost, even if they are interrelated, has a low likelihood to be successful.

An efficient approach of the project risk management should take into account the risk events, the uncertainties and resources limitations in project planning, scheduling and monitoring and also the correlation between the time, cost and resource limitation parameters. Many probabilistic methods have been developed over time and made available, especially through software implementation. However, even the most detailed models cannot ensure the reliability of the estimation process, and most of these methods are not properly applied or not applied at all. The main reasons are the complexity of the methods, the lack of expertise, and the difficulties in collecting historical data and in communicating with relevant stakeholders, especially line managers and/or resources from the functional departments.

The literature notes the difficulties that affect the ability of practitioners to carry out a project at cost or to schedule quantitative risk analysis. Determining the proper level of detail for the risk analysis (the level of aggregation of tasks or costs) and gathering relevant data to determine the probability distributions for task durations and the component costs induce some of the most relevant difficulties. The correlations between task durations and costs should be taken into account when specifying probability distributions. Generating multivariate distributions is a more difficult task than it is for the case of univariate distributions. The constraints on correlated positive random variables are also difficult and less intuitive than normal distributions.

**NOVEL TRENDS**

From the chapters compiled in this book, several trends in project risk management become explicit. Trends that can explicitly be traced in the chapters offered in this book are:

- The need for dealing with the complexity and the unknown unknowns, the increasing uncertainty in contemporary business.
- The need for considering sustainability and sustainable development in projects and explicitly in project risk management.
- The usefulness of classic approaches and the need for enriching them with novel approaches, methods and perspectives.

First of all, the increasing complexity and dynamics of the business environment, that forces project managers and their teams to deal with these uncertainties. As one approach to tackle the dynamic environment chapter 4 offers system thinking to meet the challenges of increasing project complexity and the embedded risks. However, to deals with these uncertainties asks project managers for new competences, these are discussed in chapter 1. Chapter 3 offers a Chinese approach to the understanding of risk and risk management to enrich Western thinking.

Secondly, the contemporary urge to consider sustainability in project and program management and to contribute to a sustainable development in projects, programs, companies, regions and society, can
be identified as a trend. By considering sustainability principles in management, particularly in project management the existing complexity of projects and their stakeholder landscapes become more transparent and visible. Thus managers, project owners, project managers and their teams need to handle it, without getting overwhelmed. Three chapters in this book are dealing with the topic sustainability in project risk management. While chapter 2 discusses the possible integration of sustainability principles into project risk management, chapters 6 provides methods to operationalize the integration of sustainability in project stakeholder management and project risk identification. Chapter 6 introduces the method systemic constellation for Identification of Risks and Uncertainties in projects.

In addition to the valuable classic Monte Carlo Method as presented in chapter 8, chapter 7 explains a Value-based Project Risk Management Process for Professionals. Chapter 10 argues why the ‘process’ approach for developing reliable organizational performance is insufficient for increasingly complex environments and presents the alternative perspective of ‘mindfulness-based’ reliability. Chapter 9 offers a case study on managing risks in innovation projects. Traditional perspectives such as financial risk management in chapter 15 are contrasted by perspectives such as project marketing risk (chapter 11), an education perspective (chapter 12), knowledge management, (chapter 13) and portfolio management (chapter 14).

**STRUCTURE AND CONTENT OF THE BOOK**

The book is structured into three sections. While the first section covers theory and approaches, the second section offers methods and cases, and the final third section takes specific perspectives on project risk management. The first on is dealing with approaches and theories in project risks management. This section includes the following four chapters:

Chapter 1, by Yvonne Gabriele Schoper, Fritz Böhle and Eckhard Heidling is entitled Coping Better with the Project’s Unknown Unknowns: New Competences for Overcoming Uncertainty in Project. The authors raise the awareness, so far disregarded competences identified in qualitative interviews with project managers. Their research was performed by the Instituut für Sozialforschung, Munich (ISF) and in the course of the expertise “dealing with uncertainty in projects” for the German Association of Project Management (GPM).

In Chapter 2, Gilbert Silvius examines the Integrating Sustainability into Project Risk Management. He identifies four main concepts, in order to provide the conceptual foundation of sustainability: triple bottom line, life-cycle orientation, stakeholder theory and compliancy, transparency and accountability. Based upon a comparison of the processes of project risk management as described in the main standards of project management and risk management, it is concluded that these standards are agreeing on a set of four processes that form the core of project risk management. Based on these four processes, confronted with the four main concepts of sustainability, conceptual model of the study and conceptualized the impact of considering sustainability in the processes of project risk management was developed.

Chapter 3 by Anbang Qi and Lixia Zheng, explore the reasons why Chinese believe that project risk management is the core work and the key to successful projects. It is argued that Chinese have their own ideas, attitudes and methods for project risk management because of their different history and culture.
Chinese trust that only people can really add some values to projects through project change and risk management because certain things of projects are unchangeable and cannot add any more value to projects.

In Chapter 4 Steve Raue and Louis Klein, argue for a systemic practice to project risk management. The authors show how to apply a systemic approach to improve risk management on different levels in different ways, and how the system thinking meets the challenges of increasing project complexity and the embedded risks.

The second section of the book is about methods and cases in project risks management. This section includes the following six chapters:

Chapter 5 describes the importance of balancing risk reduction and “taken risks” and what role a holistic risk identification plays in the context of Sustainable Development. Martina Huemann and Claudia Ringhofer discuss the holistic risk identification. A risk identification explicitly considering Sustainable Development Principles as well as considering project and stakeholder risks is presented within a case study. The case study project is an Engineering, Procurement and Construction of a wind park farm in Brazil from the supplier perspective. The risks of the project as well as the risks of the project stakeholders are considered. Whereby the chapter shares the risk identification as such as well as the process for which a systemic board constellation was applied.

In Chapter 6, Ursula Kopp argues that although various tools are available to support the risk management process, difficulties are encountered when project risk management is carried out in practice. The aim of this chapter is to introduce a tool that can help managers identify project risks, learn about their dynamics within the project and, consequently, formulate better ideas of how to address the risks. Project Risk Constellations are the spatial representations of explicit and implicit knowledge of the relationships, orders, hierarchies, dependencies and communication patterns of a project. They provide multi-dimensional and multi-layered information and reveal deeply rooted mechanisms. They quickly enable project managers to better understand the dynamics of their project, the intended and unintended impacts, ambiguities as well as project risks and uncertainties.

Chapter 7 by Tamas Toth and Zoltan Sebestyen, is about an integrated project risk analysis method, which tracks the probabilities of the occurrences of harmful events perceived by the owners from the conceptual phase to the end of the project. The chapter provides a revised integrated project risk assessment framework that enhances conventional risk category-based methods. The minimum requirements of the owners are clarified to attain the main goal of project risk assessment and to identify the harmful events jeopardizing this goal. Then, a methodology for taking and selecting proper risks is provided. And finally, a valuation approach to the monitoring phase is introduced, being able to capture the current market value of the project based on the risk management and controlling system’s data.

In Chapter 8, Cristiana Tudor and Maria Tudor, provides a sound background on the Monte Carlo methods. The chapter contains a mix of theoretical elements and basic applications, with the potential to become more complex by expanding the inputs according to the specific information about and needs of a given project. At the beginning, the chapter discusses the main theoretical elements concerning the Monte Carlo Simulation (MCS), describing concepts such as systems and models, and providing a brief discussion on the main steps of a MCS, from input analysis to the analysis of simulation results (output statistics). After that, the chapter offers a more in-depth discussion of the intermediary steps of a MCS, and as such theoretically presents the most common probability distributions (both discrete and continuous), as well as the standard methods for estimating the parameters of a distribution or distribu-
tion fitting. Then, the chapter shows how a standard Microsoft Excel® add-in can be used to perform a Monte Carlo simulation to forecast the likely outcome for both project schedule and cost. Some simulation results are also presented.

Chapter 9 is concerned with the similarities and/or the heterogeneity of the innovation taxonomy that could be found in the economic domain. Stelian Stancu provides an analysis of the innovation projects characteristics in service industry is presented, as the basis for a proposed framework for managing risks. A case study for the Romanian mobile communication industry using data provided by specialized publications is presented at the end of the chapter.

In Chapter 10 Elmar Kutsch presents the alternative perspective of ‘mindfulness-based’ reliability is provided and applied to the K2 mountaineering tragedy of 2008 as a case study. Through extensive analysis and detailed interviews with survivors, the underlying reasons and behaviors that can create ‘mindlessness’ are identified. Although this is an extreme example, it is explain how the issues can be valuable for managers in less extreme environments and a model of the organizational behaviors and cultural attributes that may be developed to support organizational mindfulness is synthesized.

The last section of the book addresses the perspectives in managing project risks and includes the following chapters:

In Chapter 11 Rodney Turner considers the risks that can arise in three elements of the marketing: marketing by the project, marketing for the project and marketing of the project. The causes of those risks and what can be done to counteract them are explored.

Chapter 12 brings forth the issue of the development of the project risk management competencies that became an ubiquitous objective for education and training in project management. The authors Radu-Ioan Mogos, Constanta-Nicoleta Bodea, Stelian Stancu, Augustin Purnus and Maria-Iuliana Dascalu examine the main challenges in addressing project risk management subject in the education programmes and identify how these challenges could be dealt by using curriculum management systems. In order to implement the identified improvements, the authors propose an innovative architecture for a curriculum management system, which can be adopted by those universities interested in developing competencies-based programmes in project management. Some preliminary results are presented and discussed.

In Chapter 13 Alfredo Federico Serpell, Ximena Ferrada and Larissa Rubio propose a knowledge-based system for promoting the application and improvement of risk management in construction projects. The proposed system includes a maturity model for assessing risk management capabilities, a module of improvement for reducing maturity gaps, and also, a knowledge base that supports project’s risk management and has the ability to acquire knowledge from historical projects experiences.

Chapter 14 discusses managing projects and project portfolios risk in regard to sponsor conditions for funding projects, how these conditions together with technical and contractual risks generate new risks that affect the performance of the portfolio. Nicolae Postăvaru and Bogdan Leonte concludes with recommendations on how to mitigate risks by developing specific methodologies for managing both financial and technical risks.

Chapter 15 by Rares Stoian and Mirela Madalina Stoian focus on the basic principles in creating a viable risk management framework that keeps track of three major categories of identified financial risks: market risk, credit risk and liquidity risk. Emphasis is put on the models to measure these types of risks but also on the tools an organization can use in order to reduce them.
The book is useful to project managers, project directors, project owners/sponsors, Project Management Office managers, senior general managers, IT directors as well as to students (undergraduate to postgraduate level), in general for all those interested to better understand and adopt project risk management systems and tools.

Enjoy reading!

Constanta-Nicoleta Bodea  
*Bucharest University of Economic Studies, Centre for Industrial and Services Economics, Romania*

Augustin Purnus  
*Technical University of Civil Engineering Bucharest, Romania*

Martina Huemann  
*WU-Vienna University of Economics and Business, Austria*

Miklós Hajdu  
*Budapest University of Technology and Economics, Hungary*