

# Project portfolios in dynamic environments: Organizing for uncertainty

Yvan Petit

*Université du Québec à Montréal, School of Management Sciences, 315, Ste-Catherine East, room R-2450, Montreal, Quebec, Canada H2X 3X2*

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## Abstract

This research investigated the following research question: *How is uncertainty affecting project portfolios managed in dynamic environments?* While different approaches have been developed in the context of the management of single projects these ideas have not been carried over to the management of project portfolios.

The dynamic capabilities framework is used as the framework to study the management of project portfolios in dynamic environments. The research is based on four portfolios in two firms using retrospective analysis. Sufficient material was collected and analyzed to contribute in the following areas: (1) To provide a better understanding of the management of project portfolios facing uncertainty, (2) to analyze the relationships between the sources of uncertainty in dynamic environments and the organizing mechanisms put in place by organizations to minimize their impact and to capitalize on opportunities, and (3) to identify possible improvements to project portfolio models and standards.

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## 1. Introduction

The project portfolio management (PPM) literature has been focusing primarily on project selection, prioritization and balancing with the primary aim of doing the right projects. Once the list of projects is decided, the assumption is that projects will be managed using the now commonly accepted good practices documented in the project management literature. An underlying assumption is that there will not be significant changes to the portfolio until the next periodic review, be that quarterly, bi-annually or annually, and that individual projects will deal with the risks and uncertainties in the course of their execution. This research studied how uncertainties are managed at the portfolio level reusing concepts borrowed from the dynamic capability literature. Following the presentation of the theoretical framework, the research methodology is described. The final section of the article presents and discusses the results.

This research attempts to answer the following research question: *How is uncertainty affecting project portfolios managed in dynamic environments?* with four main objectives:

- To identify the organizing mechanisms used to manage uncertainty affecting project portfolios in dynamic environments,
- To evaluate the use of the dynamic capability framework for the study of project portfolios,
- To study project portfolio management at the operational level using concepts borrowed from sensemaking (traditionally used to study the interpretative mechanism at the individual level) and from dynamic capabilities (traditionally used to study strategic processes at the corporate level),
- To identify useful practices in the field of project portfolio management.

## 2. Project portfolio management

The most significant literature on PPM was developed in the study of new product development portfolios (Cooper et al., 2001; Krishnan and Ulrich, 2001; McGrath, 2004). This

*E-mail address:* [petit.yvan@uqam.ca](mailto:petit.yvan@uqam.ca).

empirically-based literature focuses on the project selection process and choices among many potential projects. The concepts of selection criteria, balancing and strategic alignment are central to this literature. The *Standard for Project Portfolio Management—Second Edition* (Project Management Institute, 2008b), is based on the same concepts and has much the same focus. The standard defines a project portfolio as: “a collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives” (Project Management Institute, 2008b, p.138). This standard proposes a process that stresses the importance of the alignment of the project portfolio to the firm’s strategy, as well as the identification and prioritization of the projects being fundamental to ensure that firms execute the most beneficial projects. This concept is analogous to financial portfolios but the primary focus of PPM is on how to select and prioritize projects to ensure that risks, complexity, potential returns, and resource allocations are balanced and aligned to the corporate strategy in order to provide optimal benefits to the enterprise.

Up until now, the PPM literature has made little mention of potential disturbances to the portfolio typically found in dynamic environments although the Project Management Institute (PMI) standard describes two types of changes. The first one refers to periodical reviews of the portfolio performance “to ensure that the portfolio contains only components that support achievement of the strategic goals. To achieve this, components must be added, reprioritized, or excluded based on their performance and ongoing alignment with the defined strategy in order to ensure effective management of the portfolio” (Project Management Institute, 2008b, p.77). The second type relates to significant changes in the business environment resulting in a new strategic direction: “as environments inside and outside the organization change, criteria for determining the composition and direction of the portfolio may also change... When the need for new criteria becomes evident, the portfolio management team needs to examine the current criteria in the strategic plan and move ahead with appropriate changes, usually focusing first on categorization. If strategic change is not occurring, the efforts should focus on portfolio balancing” (Project Management Institute, 2008b, p.84).

In addition, adjustments to the ongoing portfolio might be made without going through a complete review cycle, an activity briefly mentioned in the PMI standard in the section on Communicate Portfolio Adjustment (Project Management Institute, 2008b, p.71). The Association for Project Management (APM) mentions this type of change in terms of “adjustments of the portfolio with regard to the constraints, risks, and returns anticipated, and in the light of developing circumstances around the portfolio” (Association for Project Management, 2006, p. 8).

The present research focuses on the management of the project portfolio in dynamic environment after the project portfolio has been established. In this research, it is assumed that portfolio managers might not only monitor changes but might also implement processes to manage and control change. It is therefore suggested that the existing processes be supplemented with additional empirical information.

### 3. Risk management and uncertainty management

#### 3.1. Risks

Both PMI and APM define a risk as an uncertain *event* which might have positive effects (opportunities) or negative effects (threats). A typical classification of risks is based on the level of knowledge about the risk occurrence (known or unknown) and the level of knowledge about the impact (known or unknown). This leads to four possibilities (Cleden, 2009, p.13): (1) Known–Knowns (Knowledge), (2) Unknown–Knowns (Untapped Knowledge), (3) Known–Unknowns (Risks), and (4) Unknown–Unknowns: (Unfathomable uncertainty).

#### 3.2. Risk management

Different processes have been developed to deal with risks, mainly in the category of the *known–unknowns*. Risk management includes the different techniques to either reduce the probability of occurrence of an event or reduce its impact on the project (or inversely for positive risks). The risk management processes include activities to identify, assess, plan a response, and implement a response. It uses mainly proactive management actions although it might involve reactive action in the case of uncontrollable unknowns or in the case when risks become reality (Association for Project Management, 2006; Pavlak, 2004; Power, 2007; Project Management Institute, 2008b).

Once risks have been identified through brainstorming techniques or expert judgment they are typically assessed using a probability and impact assessment to determine the overall potential impact on the project (Association for Project Management, 2006; Project Management Institute, 2008a). The risk management response planning techniques include: (1) Risk avoidance, (2) Risk mitigation, (3) Risk transfer, and (4) Risk acceptance. The techniques proposed to analyze and develop risk responses at project portfolio level are similar to the techniques identified in the PMBOK Guide® for single projects i.e. avoidance, mitigation, transfer and acceptance.

#### 3.3. Uncertainty management versus risk management

The term *risk* refers to *events* rather than being associated to more general sources of uncertainty. In projects undertaken in rapidly changing environments where uncertainty may be unavoidable managers need to go beyond traditional risk management, adopting roles and techniques oriented less toward planning and more toward flexibility and learning (De Meyer et al., 2002; Platje and Seidel, 1993).

Some authors have advocated the use of the broader concept of *uncertainty management* instead of *risk management*, which is too focused on threats and events (Cleden, 2009; Perminova et al., 2007, 2008; Ward and Chapman, 2003). “Uncertainty management is not just about managing perceived threats, opportunities and their implications. [...] It implies exploring and understanding the origins of project uncertainty before seeking to manage it, with no preconceptions about what is desirable or undesirable”. (Ward and Chapman, 2003, p. 98–99).

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