

## The impact of project portfolio management on information technology projects

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### Abstract

The ever-increasing penetration of projects as a way to organise work in many organisations necessitates effective management of multiple projects. This has resulted in a greater interest in the processes of project portfolio management (PPM), with more and more software tools being developed to assist and automate the process. Much of the early work on PPM concentrated on the management of IT projects, largely from the perspective of the management of resources and risk. Many of the recent articles have been by vendors of the software, promoting the value of the PPM process. However, the claims made in those articles are typically only supported by anecdotal evidence. In this paper, we assess whether there is a correspondence between the use of PPM processes and techniques, and improvements in the performance of projects and portfolios of projects. Based on our findings, we introduce a three-stage classification scheme of PPM adoption, and present a strong correlation between (1) increasing adoption of PPM processes and a reduction in project related problems, and (2) between PPM adoption and project performance.

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### 1. Introduction

Recently, information technology (IT) has moved beyond the implementation of IT applications to an age of IT-enabled change. The trend towards increasing use of IT continues and the challenge remains how to better

manage IT projects in order to maximise their economic benefits. Part of that challenge can be tackled by “doing projects right” and part by “doing the right projects” [1]. While Project Management concentrates primarily on the former, Project Portfolio Management, hereafter referred to as PPM, is focussed on the latter. Contrary to Project Management, which focuses on single project, and Programme Management, which concerns the management of a set of projects that are related by sharing a common objective or client, or that are related through interdependencies or common resources, PPM considers the entire portfolio of projects a company is engaged in, in order to make decisions in terms of which projects are to be given priority, and which projects are to be added to or removed from the portfolio (see also Lycett et al. [2]).

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PPM has largely developed around the following elements: providing a centralised view of all the projects in an organisation, enabling a financial and risk analysis of projects, modelling interdependencies between a family of projects, incorporating constraints on resources shared between projects, enabling prioritisation and selection of projects, ensuring accountability and governance at the portfolio level, allowing for portfolio optimisation and providing support in the form of standardised processes and software tools.

However, despite the relatively extensive literature on PPM (see Sections 2 and 3), evidence of its value has been rather anecdotal. It is unclear whether there are specific PPM elements that add more value than others or indeed, whether they add value at all. It is for these reasons that we decided to investigate the potential for increasing business value through the application of PPM techniques to IT projects.

The first contribution of this paper is the development of a classification scheme for the adoption level of PPM across a diversity of organizations. Secondly, we identify the impact of the PPM adoption level on project performance by investigating the correspondence between the adoption level and reported project-related problems on the one hand and observed positive elements in projects on the other. Finally, we suggest a phased implementation process for the adoption of PPM and describe the challenges that organisations might face in each phase.

The paper is organized as follows. Sections 2 and 3 contain a literature review of the theories, models and processes presented for PPM, reviewed according to a historic and a thematic perspective. The historic perspective provides a view of how the field has developed over time, while the thematic perspective summarizes the main themes identified in the literature. Section 4 describes the objectives and hypotheses of this study, as well as the methodology used, with the general results presented in Section 5. In Section 6, we present a classification for adoption levels of PPM and in Section 7 we investigate the impact of PPM and project performance, highlighting the managerial implications of this analysis. In Section 8, we provide a phased implementation plan. Section 9 contains a summary and our conclusions.

## 2. Literature review: a historic perspective

The field of portfolio management owes its origins to a seminal paper written in 1952, in which Harry Markowitz [3] laid down the basis for the Modern Portfolio Theory (MPT). MPT allows to determine the specific mix of investments generating the highest return for a given level of risk. Whereas MPT was initially developed for financial investments, in 1981, McFarlan [4] provided the basis

for the modern field of PPM for IT projects. According to McFarlan, management should also employ a risk-based approach to the selection and management of IT project portfolios. He observed that risk-unbalanced portfolios could lead an organization to suffer operational disruptions, or leave gaps for competitors to step in.

In 1992, Wheelwright and Clark [5] developed a framework for categorising projects that they called the Aggregate Project Plan. This plan allows for an overview of the project portfolio along two dimensions, (1) the extent of changes made to the product, and (2) the degree of process change, leading to four categories of projects (in increasing order of change): derivative projects, platform projects, breakthrough projects and R&D projects (for complete definitions see [5]). This framework can be used to identify gaps in the portfolio, or potential resource shortages.

In the mid-1990s, the field of PPM received increasing attention. In 1994, a GAO report [6] described a successful company that used portfolio investment techniques to manage its IT projects. The organisation developed a set of criteria to evaluate benefits, costs and risks and thus determined the best mix of projects for obtaining a better balance between maintenance and strategic initiatives. As a result, in three years, the organization reported a 14-fold increase in the return on investment from IT projects.

In 1998, Thorp published the “Information Paradox” [7], putting PPM in a broader framework called “Benefits Realization”. According to the author, PPM techniques are fundamental for getting value from IT projects.

In a recent publication, Jeffery and Leliveld [8] report the results of a survey with 130 senior executives, 90% of whom were CIOs. The survey identified, among other things, that 25% of the respondents could be defined as optimally applying Information Technology Portfolio Management (ITPM), 45% as having or adopting it and 78% as planning to have or to keep it.

## 3. Literature review: a thematic perspective

In this section, we review the main themes around which research on PPM has been developed, namely the PPM objectives and scope, the pre-conditions for PPM, the key elements of PPM, the impact on organisations and the problems within organizations associated with a lack of PPM processes.

*PPM objectives and scope.* The majority of the literature in the PPM field provides similar lists of objectives to be achieved through the adoption of PPM approaches. Five main goals dominate the literature [9–11], namely (1) defining goals and objectives, i.e., clearly articulating what the portfolio is expected to achieve, (2) understanding, accepting, and making trade-offs, (3) identifying, eliminating, minimizing and

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