

# Formalization of project portfolio management: The moderating role of project portfolio complexity

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## Abstract

Companies frequently implement formalization to improve success. Previous research has found supporting evidence for the performance-enhancing effects of formalization in both single project management and project portfolio management. However, there is no research on how formalization at the project level interacts with formalization at the portfolio level, or on how this interaction may impact success. This study investigates the interaction of formalization at both levels and examines the moderating effect of project portfolio complexity on formalization. Using a sample of 134 firms, this study shows that single project management formalization and, likewise, portfolio management formalization are directly connected to portfolio success. Simultaneous formalization at these two levels delivers a complementary effect, resulting in an increase in success that is more than additive. A contingency analysis confirms that the proposed positive effects become more prominent if complexity is high. Complexity measured as project interdependency has a stronger moderating effect than complexity measured as portfolio size.

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## 1. Introduction

Formalization is a central construct in organizational theory and is recognized as a central element of bureaucratic regimes (Weber, 1922). Many studies have shown a positive relationship between formalization and organizational performance (Nahm et al., 2003; Pearce et al., 1987). The drivers and impact of formalization were first studied for *permanent organizations*, which are founded for an unspecified period with the goal of long-term performance for their stakeholders. More recently, researchers have investigated formalization in the context of the *temporary organization* “project” (Lundin and Söderholm, 1995) and found that the formalization of single project management is connected with project performance (Liu et al., 2008; Milosevic and Patanakul, 2005; Na et al., 2004; Nidumolu, 1996; Payne and Turner, 1999). However, there is little research on the interplay between the formalization of per-

manent and temporary organizations. The present study integrates both views by analyzing the formalization of single project management and project portfolio management, a subsystem of the permanent project-oriented organization.

Single project management (SPM) formalization includes the definition and implementation of standard tools (Milosevic and Patanakul, 2005), established standards (Nidumolu, 1996), defined procedures and processes (Dietrich and Lehtonen, 2005), tight controls (Liu et al., 2008), and consistency across single projects (Payne and Turner, 1999). As the number of projects increases, it is particularly important to guarantee effective and efficient execution of project portfolios. This remains a challenge despite the formalization of single projects, which facilitates faster process implementation and better process quality (Ahlemann et al., 2009; Garcia, 2005). Cooper et al. (2001) emphasize the importance of a well-structured and consistently applied process for project portfolio management in new product development. Consistency of processes facilitates the management of interdependencies between projects and the comparison of divergent projects (Cooper, 2008). While companies are keen to invest heavily in education and (re-)certification of their project management professionals and to

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make use of external guidelines supplied by professional project management organizations to establish standardization, the return on these investments in formalization remains uncertain.

Martinsuo and Lehtonen (2007) suggest that empirical research should link project management practices such as formalization to the portfolio level to increase efficiency in managing project portfolios. De Reyck et al. (2005) support this claim by noting that respondents who implemented the formalization of single project analysis improved their performance within the project portfolio environment. However, literature on the connections between the project and the portfolio level is scarce. So far, the construct formalization has been considered only at the single project level, and no study has analyzed the combined and interacting effects of formalization at both levels. To address this gap, we differentiate and measure project portfolio management (PPM) formalization. In this paper, we argue that the degree of formalization of single projects is an organizational variable that enables the implementation of project portfolio management and increases its positive impact. The definition and implementation of a formalized project portfolio management process also increase and reinforce the formalization of the single project management process.

Despite the merits of formalization, over-bureaucratized systems may paralyze organizations and increase organizational inertia as well as resistance to change. To understand the specific conditions that support the positive effects of formalization, it is essential to adopt a contingency perspective when investigating the effectiveness of formalization (Burns and Stalker, 1961; Dietrich, 2007; Donaldson, 2001). Various characteristics, such as the size, composition, or innovativeness of projects in the portfolio, may influence the effectiveness of formalization. However, most studies do not take contingencies into account. This study considers the individual portfolio’s condition by examining the effect of the complexity of a project portfolio on the link between formalization and portfolio success. Project portfolio complexity is of particular importance in the context of project portfolios (Söderlund, 2004; Stummer and Heidenberger, 2003) because a larger portfolio and interdependencies between projects pose challenges for the manageability of project portfolios.

This paper addresses the following research questions: How do the formalization of the single project management process

and the formalization of the project portfolio management process influence the success of a project portfolio? How do the two types of formalization interact with each other in their effect on performance? How is the influence of formalization moderated by the complexity of the project portfolio?

By addressing these questions, this study contributes to the literature in several ways. First, we provide empirical evidence for the existence of a positive relationship between single project management formalization and project portfolio success. Thus, we corroborate the claim that the standardization of single project management practices is related to project portfolio success. Second, we show that simultaneous formalization at both levels has a complementary positive effect on the quality of the execution of the project portfolio management process. We emphasize that single project management formalization is a necessary but not sufficient condition for project portfolio management quality (PPM quality). Third, we show that formalization becomes even more important for more complex portfolios (i.e., larger project portfolios and portfolios with highly interdependent projects), thus confirming the need to consider contingency factors in project portfolio management research. Fourth, we show that the relationship between formalization and portfolio success is fully mediated by the PPM quality. This finding provides additional insight into the mechanisms by which formalization affects performance and explains why complexity has a positive moderating effect.

**2. Theoretical framework and hypotheses**

The framework of this study is based on task-oriented contingency theory (Donaldson, 2001), which uses the task variable project portfolio complexity to explain the effects of formalization on project portfolio success (see Fig. 1).

The framework deserves some preliminary comments. Contingency theory goes beyond a mere enumeration of the positive and negative effects that are assumed if a certain strategy pattern or structural decision is preferred over another one. Contingency theory attempts to predict the conditions under which the positive effects of each strategy pattern will be stronger than the negative effects and the conditions under which the opposite is more likely. A contingency theory perspective does not only specify

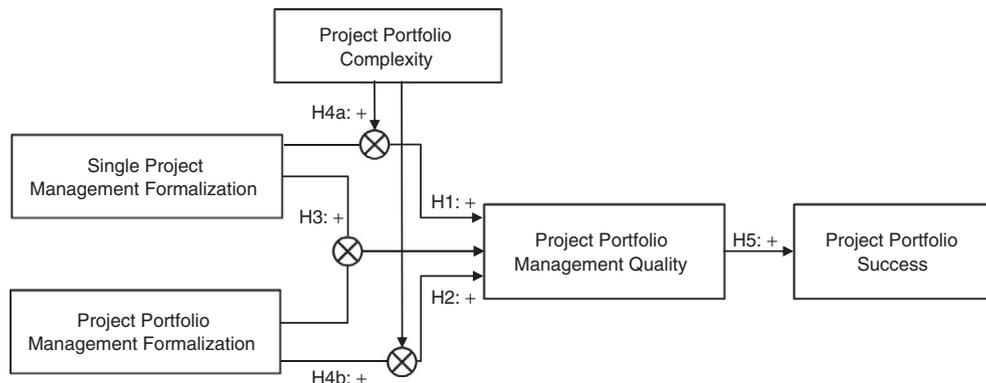


Fig. 1. Framework on the relationship between formalization, PPM quality and project portfolio success.

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