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Integrated PPM Process: Scale Development and Validation

Marisa Padovani, Marly M. Carvalho *

Production Engineering Department, Polytechnic School University of São Paulo, São Paulo, Brazil

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Abstract

This study aims to propose and validate a structural model on project portfolio management, identifying the core processes. Moreover, this study aims to investigate the relation between project portfolio management and performance. The model is proposed and validated through a survey-based research, applying structural equation modeling. The total sample size comprises 103 valid questionnaires. The project portfolio management measurement model validated is composed by a set of 11 processes as follows: knowledge of the organizational context; opportunity identification; decision criteria; classification; selection, prioritization, optimization and sequencing; balancing; approval; resource allocation; formation of portfolio; and project portfolio management infrastructure. The findings indicate that there is a strong relationship between project portfolio management and performance.

Keywords: Portfolio management, Performance; Project management, Structural equation modeling

1. Introduction

Project portfolio management is an emerging aspect of business management that focuses on how projects are selected, prioritized, integrated, managed and controlled in the multi-project context that exists in modern organizations (Young and Conboy, 2013). However, there is still a lack of consensus on which are the core processes of project portfolio management (PPM).

Some studies have been conducted to gain a better understanding of the PPM decision processes involved in the selection, prioritization, balancing, and optimization of projects and portfolios and their alignment with strategy (Archer and Ghasemzadeh, 1999; Greiner and Fowler, 2003, Cooper et al., 1999; Lager, 2002; Jolly, 2003; Roussel et al., 1991; and PMI, 2013a). However, the current organizational environment, which is characterized by greater complexity and number of projects, high level of uncertainties, aspects involving communication, reliability of information, information technology (IT) infrastructure, and distribution of information in a global environment turn also essential for portfolio management (Artto and Dietrich, 2004; Barczak and Sultan, 2006; Salem and Mohanty, 2008; Browning, 2010; Froese, 2010; Lam et al., 2010 and Vaccaro et al., 2010; Martinsuo et al., 2014). In this context, which are the core processes in PPM? This study aims to identify the core processes on PPM.

Moreover, this study aims to investigate the relation between project portfolio management and project performance. Different studies on project portfolio management have been developed to understand how the project management portfolio affects performance, receiving increasing attention as a field academic research. Various authors sustain that project portfolio management plays an important role, contributing to enable companies to continuously gain competitive advantages (Shenhar and Dvir, 2007; Dutra et al., 2014; Kaiser et al., 2015). Beringer et al. (2013) detected that project management maturity affects the intensity of engagement of portfolio-internal stakeholders and the project portfolio success. Additionally, for Patanakul (2015), the effectiveness in managing project portfolio are related to three strategic attributes:1) strategic alignment, 2) adaptability to internal

* Corresponding author at: Av. Prof. Almeida Prado, trav 2, n 128, ZIP code 05508-900, São Paulo, SP, Brazil.
E-mail address: marlymc@usp.br (M.M. Carvalho).

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and external changes, and 3) the expected value of the portfolio, and three operational attributes: 1) project visibility, 2) transparency in portfolio decision-making, and 3) predictability of project delivery. Others authors relate project portfolio success with value attributed to the projects from clients, technological turbulence and risk management (Voss and Kock, 2013; Teller and Kock, 2013). Martinsuo (2013) review has shown that many topics in project portfolio management (PPM) have been studied in qualitative settings; thus, there remains a gap o quantitative and confirmatory research on this thematic. Thus, given this lack of consensus on the core processes of PPM and the gap in the literature of quantitative research establishing the relation between project portfolio management and performance, this study aims to contribute on the literature by proposing and validating a model that links the processes of project portfolio management with performance. The research approach was based on a literature review on the core processes of portfolio management and portfolio performance to build the conceptual research model. The research model was validated through a survey-based research applying structural equation modeling.

In the next section, we provide a theoretical overview that addresses the literature on project portfolio management and performance. The methodological approach of the research is detailed in Section 3, followed by the results in Section 4. Section 5 presents the discussion and our conclusions.

2. Literature review and research model

2.1. Processes of portfolio management

The portfolio management is a dynamic decision process that deals with multiple goals (Cooper et al., 2001), reflecting internal and external stakeholders perspectives (Beringer et al., 2013), encompassing strategic considerations and adaptability to internal and external changes (Patanakul, 2015), resulting in a dynamic and uncertainty decision-making process.

Portfolio management can be understood as a set of processes leading decision-making. Despite some efforts towards achieving an integrated framework for portfolio management (Archer and Ghasemzadeh, 1999; Coldrick et al., 2005; Cooper et al., 1998; Dettbarn et al., 2005; Ghasemzadeh et al., 1999; PMI, 2013a; Wheelwright and Clark, 1992), there is still a lack of consensus on which are the core processes of project portfolio management (PPM).

Carvalho et al. (2013) based on a systematic literature review argue that the core processes that had better consensus among PPM frameworks (five or six mentions) are: project proposals, strategic drivers and criteria, opportunities identification, evaluation, selection, prioritization, resource allocation, monitoring & control. Two processes, resources constraints and balancing, have some degree of consensus (three and four mentions). Fewer consensuses (only one or two mentions) remain on the following processes: PPM methodology, categorization, adjust and authorization.

The set of processes follows a logic sequence from the opportunities identification from the formation of portfolio and evaluation. Moreover, it demands the knowledge of the organizational context in a strategic perspective, supported by the appropriate organizational infrastructure. Fig. 1 shows the core processes in PPM considered in the research model and Appendix A presents the literature traceability of the processes considered.

At the top of Fig. 1, the knowledge about the organizational context (KOC) drives the portfolio decision-making. It is essential for the alignment of portfolio management, enabling the strategic plan to be deployed, communicated, known and monitored at all the levels of the organization. The organization's goals, objectives and drivers need to be clearly defined as the existence of a formal planning process and of a system of performance measurement (Archer and Ghasemzadeh, 1999). Furthermore, knowledge about the internal organization context (installed capacity, technological, human resources and other constraints, etc.) and about the external environment (competitors' actions, customer needs, government regulatory actions, etc.) should be used in the strategic planning (Artto and Dietrich, 2004; Cañez and Garfias, 2006; Martinsuo and Lehtonen, 2007; Buys and Stander, 2010), assuring adaptability to internal and external changes (Patanakul, 2015).

In the middle of Fig. 1 are a set of PPM processes, receiving from the top level the decision criteria (DC) and the resource to be allocated (RA). To select and prioritize the most feasible projects, obtaining a portfolio with the highest value and which meets the needs of the organization, requires clarity about the organization's goals and objectives and decision criteria (DC) that are aligned and defined with the main stakeholders (Cooper et al., 1997; Hart et al., 2003; Girotra et al., 2007; Hart et al., 2003; Beringer et al., 2013). Resource allocation (RA) is an important activity of portfolio management, and should be included in the prioritization step, given that human resources are usually limited and constitute constraints. The decision process increases complexity according to the number of projects in the portfolio, which is why there are many IT decision support tools. In general, optimizers allow for the inclusion of project constraints and interdependencies, generating a list of prioritized and sequenced projects. The number of projects may be limited through the introduction of budget or human resources constraints, allowing decisions to be made about which projects should be eliminated and which should remain in the portfolio.

The DC and RA link the strategic level with a logical series of activities that involve full participation by key stakeholders, starting with the preparation of a list of proposals for new projects and ongoing projects. In this article, this step is referred to as the opportunity identification (OI). The purpose of this process is to list information about the scope, objective, value, earnings, market and other information about the candidate proposals in a single place, to provide a global vision of the entire portfolio of projects, which is needed for decision making. In addition, it is important to classify (CL) projects so that clusters can be created and similar projects compared during the decision process. The creation of classes of projects also provides a balance among the projects in the portfolio, according to different visions (Agresti and Harris,