



# Managing program impacts in new product development: An exploratory case study on overcoming uncertainties

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## Abstract

New product development (NPD) programs are designed to implement innovation strategies in a coordinated way. Managing program impacts in a multi-project setting is insufficiently covered in research and increasingly challenging in practice. This paper explores program impact management practice. The paper focuses on NPD program impact management as a joint effort where program stakeholders collectively identify, make sense of and overcome uncertainties and ambiguities to create and enhance the program impact. The qualitative study relies on in-depth access to a large-scale NPD program in the machine manufacturing industry. The results show that program impact includes several financial and non-financial aspects and is made jointly and separately by the program organization, thus involving different uncertainties and ambiguities. Through collective sensemaking, knowledge about the program impacts may be strengthened, and the impacts may be extended beyond immediate benefits.

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## 1. Introduction

“No one comes, you see, in a couple of years, with a money briefcase bringing what [achieving a certain NPD program objective] is worth, telling: ‘here is the million’” (Product management, 18-03-2014).

Programs are considered as entities of multiple projects that enable achieving business benefits (Levene and Braganza, 1996; Pellegrinelli, 1997) in the interface between single projects and organizational strategy (Shao and Müller, 2011). New product development (NPD) programs can be considered as vehicles for implementing innovation strategies as single NPD projects within programs that are meant to be managed effectively to ensure the delivery of successful new products. However, assessing and managing the benefits attained from

NPD programs are challenging and the total program impact is still poorly understood (Winter and Szczepanek, 2008; Shao and Müller, 2011; Shao et al., 2012). The total impact of the NPD program refers to the total (lifetime) effect on the value to the stakeholders involved, typically the company and its customers, including both financial and non-financial impacts (Martinsuo and Killen, 2014; Shao and Müller, 2011; Shao et al., 2012). There are numerous uncertainties affecting the multi-project setting (e.g., Petit and Hobbs, 2010; Korhonen et al., 2014; Martinsuo et al., 2014), stemming from the multi-project characteristics and context (Martinsuo, 2013).

The practice of managing program impacts has been addressed in the literature to some extent (Shao and Müller, 2011; Winter and Szczepanek, 2008). However, it is unclear whether and how program management tools will actually support program execution to ensure the best possible impacts (Shao and Müller, 2011). One of the starting points to this paper is the contrasting finding that although a systematic use of the highly sophisticated tools and program models is suggested (Jaafari, 2007), the systematic use of the models does not necessarily yield

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optimal organizational performance (Pellegri-nelli, 2011). Hence, social processes of sensemaking may be required to understand and respond to the multi-project management requirements in its dynamic context (see e.g., Thiry, 2002; Christiansen and Varnes, 2009; Martinsuo, 2013; Martinsuo et al., 2014).

Because the existing research provides only partial and indirect reflections on managing NPD program impacts, there is a need for a detailed examination of managing NPD program impacts in practice. Although some studies address the practice of managing program impacts as an integration issue at different levels, they primarily focus on the antecedents of impacts (not the impact realization itself), and they mostly focus on organizational change programs (not NPD). Moreover, studies on multi-project organizing (e.g., Petit and Hobbs, 2010; Korhonen et al., 2014) have highlighted uncertainty as an issue to be managed, but previous studies do not cover how ambiguities, or the lack of understanding in general should be dealt with in NPD programs.

### 1.1. Goals and research questions

The goal of this paper is an increased understanding of managing program impacts in practice – particularly in multi-project NPD programs – and the identification of social mechanisms promoting program impacts under uncertainty and ambiguity. The focus is on three research questions: 1. How and where are (strategic) impacts managed during an NPD program? 2. What kinds of uncertainties and ambiguities emerge as part of the program? and 3. How do personnel make sense of and seek to overcome the ambiguities and uncertainties when managing the program impacts?

The study will extend previous portfolio-centric and single-project-oriented research with a focus on strategic NPD program impact management. The paper is built on an exploratory case study of a large-scale NPD program setup to implement a global technology leader's innovation strategy. The paper thus contributes to the understanding of the activities underlying program impacts, and a wide range of challenges experienced, discussed and overcome when managing a program's impacts. Uniquely, the case study deepens the discussion on program impact management to the social processes of sensemaking related to program impacts. This paper suggests that by understanding the social processes of sensemaking, the mechanisms underlying program impacts may be better understood and the related ambiguities managed.

## 2. Literature review

### 2.1. Program impacts in general

Programs are defined as entities of multiple projects, aiming at achieving a set of major benefits that are more than just the sum of the projects they consist of (Pellegri-nelli, 1997; OGC, 2003; Nieminen and Lehtonen, 2008). The foundations of program management differ from those of project management (Arto et al., 2008), and program management needs to be considered more broadly than in terms of merely managing large projects (e.g., Lycett et al., 2004). Pellegri-nelli (1997) identifies higher level complexity, uncertainty, and goal ambiguity as characteristics of

program management in comparison with single project management, and the program management should take into account these requirements. The realization process of the program impacts has rarely been examined, but there are several studies on the initial program impact definition and the *ex post* program success measurement (e.g., Shao and Müller, 2011).

When managing program impact, the total lifetime profitability and value to the parties involved should be understood and divided into a set of manageable elements. Some of the elements are financial, and some of them are non-financial and may relate to customer benefits, ecological value, learning, synergy, and other aspects (e.g., Martinsuo and Killen, 2014). The desired value elements should be translated into program objectives and related performance indicators. As programs involve multiple projects with complex causes and effects, a set of financial and non-financial indicators are needed to comprehensively understand the program impact, and to define its linkages to the strategy.

The total program impact, in the long term, is supposed to be transformed into business profitability (revenues, costs, and/or capital invested and related risks) and into the personal utility of the people involved. The impact can be viewed and perceived differently by different stakeholders (Thiry, 2002; see also Martinsuo and Killen, 2014). In Thiry's (2002) view, value is about satisfying multiple stakeholders' needs through an efficient use of resources. Some authors have studied the achievement of desired impacts by using some related concepts such as value, strategic value, benefits, and specific types of impacts. Winter and Szczepanek (2008) characterize programs as value-creating processes where the attention should be placed more on the customer's value creation than on a certain product. Some authors focus on achieving strategic value, which may include economic profitability, stakeholder satisfaction, societal influence, and social and ecological responsibility more broadly (Eweje et al., 2012; Martinsuo and Killen, 2014). Although managing the financial and non-financial impacts of the programs is an essential part of program impact management in general, achieving program impacts has received very limited empirical attention.

### 2.2. The need to study program impacts in their context

The selected financial and non-financial performance indicators should constitute the overall 'theory' of business phenomenon; program impacts in this case. In practice, however, such a set of performance indicators cannot exist that would fully capture the intended total impact of the program (see e.g., Chapman, 1997), but the indicators are subject to collective sensemaking to better fit their context (Englund et al., 2013).

Lycett et al. (2004) highlight the necessity of moving from rigid and controlled program management toward a more flexible program management where the program-specific features are taken into account and program management enables adaptability in the context of a changing environment. They also emphasize program management's relationship-oriented role due to the existence of multiple stakeholders with different interests. Indeed, integration of a program into a single entity is crucial (Dietrich, 2006; Lehtonen and Martinsuo, 2008, 2009; Maniak and Midler,

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