

Project portfolio management in practice and in context

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Abstract

Companies struggle with the sub-optimization and changes among their projects, even if various normative instructions and good practices have been introduced for project portfolio management. At the center of this paper is the need to understand project portfolio management in practice and in context. The purpose is to report a review on recent empirical research literature regarding project portfolio management, to draw attention to the limitations with viewing portfolio management as a rational decision process, and to develop new avenues for research regarding project portfolio management in practice and in context. As a result, this paper shows that, to respond to uncertainties and complexities in business environments, project portfolio management can be viewed as negotiation and bargaining and as structural reconfiguration, besides rational decision processes. These alternative perspectives offer new insight into the dilemmas identified in day-to-day project portfolio management and open up avenues for resolving them, thereby promoting success in project portfolio management.

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1. Introduction

Project portfolio management (PPM) deals with the coordination and control of multiple projects pursuing the same strategic goals and competing for the same resources, whereby managers prioritize among projects to achieve strategic benefits (Cooper et al., 1997a). Project portfolio management has received a stable and central position both in project management research, product development management research, and companies' management practices during the past decade. Project portfolio management has been developed into global standards (PMI, 2008) as well as practical toolbooks (Benko and McFarlan, 2003; Cooper et al., 2001) that are expected to help companies organize and implement their own project portfolio management. Companies have adopted project portfolio management frameworks, including the use of project evaluation and decision criteria (e.g. Martinsuo and Poskela, 2011), project evaluation and control routines (e.g. Müller et al., 2008), and other means to formalize their project portfolio management (e.g. Teller et al., 2012).

Despite the variety of instructions on how projects should be selected to the portfolio, how resources should be allocated across projects, how to align the entire portfolio with strategy, and how to assess the success of the portfolio, companies still struggle with the resource sharing problem across projects (Engwall and Jerbrant, 2003) as well as constant changes in their portfolios (Elonen and Arto, 2003). It appears that, despite the project portfolio management frameworks and their well-intended portfolio analyses and investment optimizations during portfolio planning, project portfolio management models are critiqued (Henriksen and Traynor, 1999), attention managers give to portfolio activities is inadequate (Elonen and Arto, 2003), and working with multiple projects overloads the employees (Zika-Viktorsson et al., 2006). Why?

Among possible explanations is the lack of awareness of practice (i.e. what managers actually do) and context (i.e. what are the unique conditions in which the project portfolio is being managed). Recent empirical research indicates that many such kinds of issues may be extremely relevant to the success in project portfolio management. For instance the resource issue raises many viewpoints of PPM in practice. On the one hand, projects must share their resources and knowledge, to diffuse

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good practices and learn from each other (Nobeoka and Cusumano, 1995, 1997). Such sharing can clearly benefit the entire portfolio as capability and technology synergies can be exploited and capacity use be minimized. On the other hand, however, projects should try and enhance their autonomy (Martinsuo and Lehtonen, 2009), to optimize their resource use in pursuing their own performance and business goals. Centering resources for a single project can also benefit the entire portfolio as project execution speed may be maximized and new products can be brought to market rapidly. This dilemma in resource sharing is poorly understood and hardly solved in project portfolios and is just one among others. Many other deviations from the companies' PPM frameworks appear in the day-to-day practice (e.g. Blichfeldt and Eskerod, 2008), suggesting that the current frameworks do not cover all relevant factors.

Also, the context and the micro-level dynamics of portfolios generate repeated concerns for project and portfolio managers. Even if risks and uncertainties are supposed to be covered as part of portfolio analyses (e.g. Archer and Ghasemzadeh, 1999b; Henriksen and Traynor, 1999), the mundane reality of new customer requests, added feature requirements, schedule and cost changes, and risk realization impact project portfolios more *between* portfolio analysis events than *during* them. This means that portfolio managers must pay attention to their context continuously and not just during portfolio selection or other pre-planned portfolio analysis events. Changes may be necessary for optimizing the portfolio and satisfying the customers, but at the same time they alter the logic of the project portfolio management system by displaying political and emotional decision processes instead of rational ones (e.g. Christiansen and Varnes, 2008). Implications of the context dependencies and micro-level dynamics of portfolios have not, yet, been sufficiently understood and explained at the portfolio level.

The practice and context of PPM question the applicability of "traditional", normative decision making centered project portfolio management, particularly in rapidly changing business environments. Although the popular press has suggested some dynamic solutions to portfolio management (Benko and McFarlan, 2003; Brown and Eisenhardt, 1998), empirical research has not, yet, developed or adopted feasible solutions to project portfolio management that would sufficiently account for practice and context.

1.1. Research task and questions

The purpose of this paper is to report a review on recent research literature regarding project portfolio management, to draw attention to the dilemmas identified in prior research and their underlying sources, and to develop alternative viewpoints to project portfolio management in practice and in context to frame future studies. The paper is focused on three research questions:

RQ1. In what ways is current project portfolio management understanding limited?

RQ2. How are the practice and context of project portfolio management accounted for in recent empirical research?

RQ3. How should forthcoming research on project portfolio management be guided to enable better awareness of practice and context?

The paper is conceptual in nature and, therefore, no new empirical evidence is reported. However, prior empirical research is broadly covered, and particular attention is paid to suggesting avenues for further research based on the review. The references used in this review are primarily from research in product development portfolios, due to extant research being focused on them. However, modern firms are increasingly involved in both delivery and development projects, and their portfolios may share the same resources. Therefore, this paper assumes that any types of projects may be included in project portfolios. Some particularities of project types are considered as part of future research avenues.

Next, the dominating viewpoint of project portfolio management as a rational decision making process is introduced and its underlying features are analyzed (RQ1). Then, recent empirical literature is reviewed first regarding the PPM practice and then regarding PPM in context (RQ2). In the discussion section, two alternative perspectives are analyzed as possible complements to the rational decision making view (RQ3). Finally, conclusions are drawn and avenues for further research are suggested.

2. Project portfolio management as a rational decision making process

Project portfolio management (PPM) has become a central way for companies to manage their product development efficiently and effectively (e.g. Cooper et al., 1997b; Roussel et al., 1991). Among the key issues has been that projects are selected and managed in line with strategy and that resources are allocated to projects with the optimization of the entire portfolio in mind (e.g. Archer and Ghasemzadeh, 1999a,b; Arto and Dietrich, 2004; Arto et al., 2004; Englund and Graham, 1999). A lot of research attention has been on the tools and techniques for portfolio evaluation and prioritization (Hall and Nauda, 1990; Henriksen and Traynor, 1999; Ringuest and Graves, 1999; Spradlin and Kutoloski, 1999), portfolio-oriented product development process management (Cooper et al., 1997a, b, 2002), and resource management dilemmas and solutions (Hansen et al., 1999; Hendriks et al., 1999; Engwall and Jerbrant, 2003). Holistic project portfolio management frameworks have been developed (Archer and Ghasemzadeh, 1999a; Benko and McFarlan, 2003; Cooper et al., 2001; Dye and Pennypacker, 1999) and indicate that project portfolio management could well be seen as an overarching system and approach for managing product development.

The frameworks and models for project selection, resource allocation and overall portfolio management portray project choices as a rational decision making process, which definitely has its merits. Successful firms have been shown to have a systematic approach for their portfolio evaluation, decision

making and resource allocations (Cooper et al., 1997a,b, 2002; Fricke and Shenhar, 2000), and some studies show clear positive associations between some systematic methods of project portfolio management and selected measures of performance (Artto et al., 2004; Dammer and Gemünden, 2007; Fricke and Shenhar, 2000; Müller et al., 2008). Evidence on the factors explaining project portfolio management performance is still limited and more research is needed to test all aspects of the frameworks. With the call for more evidence, recent research is also beginning to question some of the underlying assumptions, particularly associated with viewing project portfolio management as a rational decision process (see also Blichfeldt and Eskerod, 2008).

The assumption of project portfolio management as a rational decision process includes four underlying features that are rarely discussed but have a major impact on how project portfolio management has been studied and executed in companies. Firstly, the rational approach appears to assume that projects are obedient servants that exist primarily to fulfill the strategy of the parent organization (Artto et al., 2008a). However, innovation projects are frequently used to purposefully question the strategy and are no longer necessarily limited to one company's strategic interests only (Artto et al., 2008b). Secondly, project portfolio selection and management frameworks tend to assume that projects compete for the same resources and that all relevant resources are known and controlled by the company itself. Many of the optimization frameworks rely on such a premise despite an increasing tendency of companies to collaborate with external partners in product and service development (e.g. Artto et al., 2008b; Martinsuo and Lehtonen, 2009), various interdependencies between projects (Nobeoka and Cusumano, 1995, 1997; Prencipe and Tell, 2001), and matrix organizations having limited control over project resources (e.g. Perks, 2007).

Thirdly, the rational approach appears to assume that companies are fully aware of all possible factors – both internal and external – influencing the projects. Many of the previous studies delimit their attention to the projects that are well defined and whose environments are well known, even if also less well-defined projects are being found in portfolios (Blichfeldt and Eskerod, 2008; Loch, 2000) and many portfolio environments are inherently poorly known. Fourthly, the frameworks and related research assume that such knowledge about the projects and their execution contexts can somehow be embedded into criteria and routines that align the projects with strategy and, eventually, bring strategic benefits. Yet, there is increasing evidence that portfolio managers are not necessarily well informed (Blichfeldt and Eskerod, 2008; Elonen and Artto, 2003) and the criteria and routines do not solve multi-project problems as expected (e.g. Engwall and Jerbrant, 2003; Zika-Viktorsson et al., 2006).

As this brief overview shows, more attention needs to be paid to the assumptions associated with project portfolio management. This paper is concerned with the day-to-day practice of project portfolio management that may be much less rational than intended, as well as the uncertain, dynamic context that may be poorly understood by portfolio managers.

3. The practice and contextuality of project portfolio management

The practice of project portfolio management in its real-life context is somewhat messier and less rational than the decision-process centered frameworks would suggest. This is acknowledged in some recent empirical studies that draw attention towards the day-to-day practice of portfolio management, i.e., what project and portfolio managers *actually* do (e.g. Blichfeldt and Eskerod, 2008; Christiansen and Varnes, 2008) besides what they *should* do. Also, projects' dependence on their specific parent-organizational and stakeholder context as well as history (Artto et al., 2008a,b; Engwall, 2003; Martinsuo and Lehtonen, 2009) highlight the need to examine project portfolios in their actual dynamic context, instead of assuming a stable context. Although some critical project management research has revealed various aspects of the actuality in project-based management (see e.g. Hodgson and Cicmil, 2006), they have not, yet, taken a holistic view to the actuality of project portfolio management.

The analysis in this chapter is focused on empirical studies on the practice and context-dependence of project portfolio management published during the past few years, although some reference is made also to some earlier studies. The literature is purposively divided into two parts: articles dominantly discussing the practice of project portfolio management through managers' activities, and those dominantly discussing the contexts in which such activity takes place. Interplay between practice and context is apparent, particularly in the many articles that emphasize the situated nature and effects of managers' activities (e.g. Biedenbach and Müller, 2012; Blichfeldt and Eskerod, 2008; Christiansen and Varnes, 2008; Perks, 2007). Exploring the dynamics of project portfolio management from both the viewpoints will, however, illustrate the different levels of analysis, highlight somewhat different issues and open up slightly different avenues for further study.

3.1. Project portfolio management in practice

As a contrast to the early project portfolio management studies that often sought normative frameworks of “how portfolios should be managed” and “the best practices”, this paper is concerned with the everyday practice, i.e. what managers actually do. Managers' everyday practice may be more messy than anticipated and it is this practice that actually explains performance. Loch (2000) was among the early authors who noted that managers do not necessarily follow the formal rules of project portfolio management (i.e. predefined processes, structures and measures), but they have other principles guiding their choices. Conceptual research has proposed that the role of project portfolio managers and the power setting among managers has an effect on project portfolio management practice and success (e.g. Jonas, 2010). Recent empirical studies show additional evidence of how the everyday practice of PPM appears and affects business performance. Table 1 summarizes empirical research that raises various dimensions of practice that have been noticed to influence either the use of project portfolio management frameworks or its success. The key findings are discussed below.

Table 1
Summary of recent empirical research on PPM in practice.

Reference	Data and methodology	Key findings	Emerging issues and new gaps
Aaltonen, 2010	Historical document-based event sequence study in a single pharmaceutical company	Variation, selection and retention in the evolution of a portfolio. Co-selection and path dependency in portfolio decision making.	Poor fit of optimization models for PPM when co-selection occurs. Causalities and managers' intentions and actions in PPM require further research.
Blichfeldt and Eskerod, 2008	Qualitative interview-based study with 30 companies in different industries and project types	Projects/activities outside of the official portfolio consume and compete for resources and, thereby have an effect on PPM performance.	Official PPM differs from the actual practice of PPM. Negligence of the actual reality endangers PPM success.
Blomquist and Müller, 2006	Multi-method study: interviews (9 companies) and questionnaire (242 responses)	Project type explains certain middle managers' roles in PPM.	Need to take into account project type in selecting portfolio management practices
Christiansen and Varnes, 2008	Qualitative, multi-method single-case study in one organization	Managers do not follow the rules agreed for PPM in their decision making, but they observe others, negotiate and debate, and learn.	Portfolio decision making as a negotiation and learning process, despite the existence of formal rules. Also the business context/situation matters.
Kester et al., 2009	Qualitative interview study in 11 multinational firms	Three genres of portfolio decision making: formalist-reactive, intuitive and integrative, each with a unique set of PPM practices.	Attention needs to be paid on how people make decisions in practice. More empirical research is needed.
Kester et al., 2011	Qualitative multiple-case study, four companies in different industries	Managers use different types of portfolio decision making processes and need the right inputs for them. Decision making both as rational, political and intuitive.	Power and opinion-based decision making, besides evidence based. The model to be tested further.
Killen et al., 2008a	Qualitative multiple-case study, six companies in different industries	Companies differ in their PPM capabilities, and their investments in improving the practice of PPM were considered as successful.	Learning will alter the practice and capability of PPM over time. Longitudinal studies are suggested.
Killen et al., 2008b	Questionnaire survey with 60 respondents	Selected PPM practices such as strategic methods and portfolio maps are associated with better PPM performance.	In-depth studies are needed to further develop frameworks of how PPM practice and performance are linked.
Martinsuo and Lehtonen, 2007	Questionnaire survey with 279 respondents	Single project management, i.e., goal setting, information availability and systematic decision making, has a significant effect on PPM success	What project managers do has implications on the portfolio level, too.
McNally et al., 2009	Qualitative embedded single case study with multiple methods in three business units of one company	Managers' dispositional traits are proposed to be associated with project portfolio performance dimensions.	Managers' analytic cognitive style, ambiguity tolerance and leadership style as managers' dispositional traits. Propositions to be tested further.
Patanakul and Milosevic, 2006, 2008, 2009	Qualitative studies in six companies in high-tech industries	Assigning projects to multi-project managers requires careful consideration of the project and the manager's competences.	Project interdependencies, multitasking and other inter-project issues as relevant for managers' competences.
Unger et al., 2012b	Longitudinal questionnaire study with 54 firms	Senior management involvement has an inverted U-shaped relationship with project termination quality, and a strong positive effect on the strategic fit of the portfolio.	The role of top management

The analysis of recent empirical research reveals three major tendencies when looking at project portfolio management in practice. Firstly, it appears that *the decision making on project and portfolio selection is less planned and rational and, instead, more political and path-dependent* than the normative models would suggest. Already Loch (2000) revealed the existence of “pet projects” and “under the table” projects and their success outside of the formal portfolio management regime. Later on, for example, Blichfeldt and Eskerod (2008) showed that particularly such outer-portfolio projects confused the resource allocation system and had evident implications to portfolio performance. Christiansen and Varnes (2008) reported the negotiation and learning process that is typical in portfolio decision making, and Kester et al. (2011) showed that people need power-based negotiation as an important input to the

decision making process. Furthermore, Aaltonen (2010) showed evidence of the path dependence from past decisions to later decisions in portfolio management, and evolution of the portfolio based on both planned and co-selected project features. These studies suggest that the social and path-dependent aspects of portfolio management should not be neglected, when seeking higher project portfolio management performance.

Secondly, the empirical studies show *the crucial role of the competences and activities of the project and portfolio manager as well as top managers* in how portfolio management is played out in the day-to-day practice. For example, McNally et al. (2009) revealed that managers' dispositional traits (change resistance, ambiguity tolerance, analytic cognitive style and leadership style) were associated with project

selection strategies and how product development projects were evaluated. Martinsuo and Lehtonen (2007) revealed the important role of single-project management practices to project portfolio management performance and, thereby, highlighted the skills of project managers in taking the portfolio level into account in their work. Furthermore, Patanakul and Milosevic (2006, 2008, 2009) have emphasized that the choice of the project manager, and multiple-project managers' competencies are in a critical role in how they succeed in their managerial duties. Unless the managers have understanding on inter-project issues and multitasking, failures are possible both at single-project and at multi-project levels. Unger et al. (2012b) in turn examined the role of senior managers in how they allocate attention to managing the portfolio and discovered its importance to project termination decisions and to the strategic fit of the portfolio. However, they also emphasize the "dark side" of management involvement in that too much senior management involvement may lead to over-steering with negative side effects.

Thirdly, prior research suggests that *project portfolio management needs to be applied appropriately to each situation* and, thereby, it is not something that can be considered as static. For example, the results in the study of Blomquist and Müller (2006) indicate that project types need to be taken into account in selecting project portfolio management practices. Although some other studies do not identify project type as a relevant intervening factor in the frameworks explaining project portfolio management performance (e.g. Killen et al., 2008b; Martinsuo and Lehtonen, 2007), it is possible that the conflicting finding can be explained through the use of different measures of project type and different research designs. In turn, Blichfeldt and Eskerod (2008; also Loch, 2000) showed that managers acted on the information they had available and adapted their behavior accordingly. Aaltonen (2010), too, suggested that managers' intentions underlying portfolio decisions deserve further attention. Furthermore, the study by Killen et al. (2008a) has emphasized that capabilities for PPM develop over time and this learning has an effect on PPM performance. The situation-specific information search and behavior adaptation has an evident link to the context in which PPM takes place.

3.2. Project portfolio management in context

Increasingly, research on project portfolio management acknowledges that different practices are needed in different contexts, following a typical contingency theory argument (e.g. Donaldson, 1987; Luthans and Stewart, 1977). Conceptual research has clearly suggested that business strategy has an influence on project portfolio management and its success (Archer and Ghasemzadeh, 1999a,b; Meskendahl, 2010). Increasingly, however, attention is moving from the complexities in the parent organization (see Arto et al., 2008a,b) towards the customer needs (Voss, 2012) and uncertainties and risks in the broader business environment (Sanchez et al., 2009) as factors influencing the use and success of project portfolio management practice. Recent empirical studies show

additional evidence of how the context of PPM appears and affects performance. Table 2 summarizes empirical research that raises various viewpoints to the context that have been noticed to influence either the use of project portfolio management frameworks or its success. The key findings are discussed below.

The analysis of recent empirical research reveals two major issues when looking at project portfolio management in context. Firstly, recent studies are showing evidence that *the success of portfolio management indeed is dependent on the context*, in line with contingency theory assumptions. Such issues as organizational complexity (Blomquist and Müller, 2006; Dammer and Gemünden, 2007; Teller et al., 2012), degree of innovativeness (Dammer and Gemünden, 2007), contextual dynamics and organizational governance type (Müller et al., 2008), and the managerial context (Unger et al., 2012a; Zika-Viktorsson et al., 2006) have been identified as relevant factors associated either project portfolio management practices, project portfolio success, or their relationship. Although some of the studies look at the business or geographical context of the companies (e.g. Müller et al., 2008), attention has been directed at the parent organizational context too. For example Perks (2007) explored how inter-functional integration in the parent organization was reflected in resource allocation choices and, thereby, portfolio management, and Dammer and Gemünden (2007) and Teller et al. (2012) looked into interdependencies among projects as a context calling for different degrees in project portfolio management formalization.

Secondly, some of the studies emphasize the need to understand *risks, uncertainties and changes in the project portfolio or its context* and that such dynamics should be taken into account in project portfolio management practice. Olsson (2008) emphasized that projects in the portfolio may share risks that may become increasingly relevant business issues at the portfolio level and, therefore, need to be taken into account by managers. Petit and Hobbs (2010, Petit 2012) paid attention to the dynamics in the project portfolio environment and emphasized that such changes and uncertainties have a significant role for the portfolio. In fact, their study as well as some others (Biedenbach and Müller, 2012) portrays project portfolio management as a way to understand and seize external information to mold decisions and actions and, thereby, adjust the portfolio to the situation at hand. Instead of reactivity to an upper level strategy, such evidence suggests that projects together may have more proactive strategies in their dynamic contexts, in line with recent conceptual research on project strategy (Arto et al., 2008a,b).

4. Discussion

4.1. The need for new frameworks in project portfolio management in practice and context

The empirical research on project portfolio management increasingly assumes project portfolio management as more than a toolset for rational decision making processes. Therefore, also theoretical frameworks need to be developed further to take the practice and context of PPM into account. The above

Table 2
Summary of recent empirical research on PPM in context.

Reference	Data and methodology	Key findings	Emerging issues and new gaps
Biedenbach and Müller, 2012	Mixed method study: interviews (18) and questionnaire (64 respondents) in pharmaceutical industry	Absorptive and adaptive capabilities are associated with PPM performance.	Using external information and adjusting PPM practice based on it is relevant to success. Further research is needed.
Blomquist and Müller, 2006	Multi-method study: interviews (9 companies) and questionnaire (242 responses)	Organizational complexity explains certain portfolio management practices and middle managers' roles.	Need to take into account contextual issues in selecting portfolio management practices
Dammer and Gemünden, 2007	Questionnaire study in 151 portfolios	Usefulness of project portfolio coordination mechanisms for portfolio resource allocation quality depends on the nature of the portfolio (i.e. innovativeness and complexity)	Context dependency of portfolio management and performance. Further research is needed to understand these context dependencies.
Müller et al., 2008	Questionnaire survey with 136 respondents	Various contextual factors such as dynamics, location and governance type moderate the relationship of portfolio control and performance.	Context dependency of portfolio control and performance. Further studies are needed to test and refine the ideas.
Olsson, 2008	Action research with a transport solutions firm	Projects in the portfolio share risks that at the portfolio level may become trends and be relevant to the business.	Top managers need visibility to risk commonalities and trends in the portfolio. A risk in one project may mean opportunity for another.
Perks, 2007	Qualitative embedded single case study with multiple methods in three projects of a steel manufacturing firm	Inter-functional integration is related with resource allocation and, thereby, portfolio management. Parent organization influences its portfolios through functional domination and evaluation criteria.	Parent organization influences and managers' personal preferences both are relevant in PPM. Further research in other contexts are needed.
Petit and Hobbs, 2010; Petit, 2012	Multiple-case study with four portfolios in two companies.	Uncertainty and changes in the portfolio have a significant role in PPM.	PPM as sensing, seizing and transforming. PPM in dynamic environments requires further research.
Teller et al., 2012	Questionnaire study with 134 firms	In complex project portfolios (where projects have interdependencies), PPM formalization is even more important than less complex.	Formalization of PPM needs to take into account the context and nature of the portfolio.
Unger et al., 2012a	Questionnaire study with 278 respondents	Project portfolio management office may have different roles, and these roles have an influence on PPM practice.	The organizational and managerial context of PPM
Zika-Viktorsson et al., 2006	Questionnaire study in nine firms	Project personnel often experiences project overload due to various multi-project issues, and this overload has various negative consequences.	Multi-project setting as a work context is relevant to how work is experienced as well as to performance

analysis has shown that researchers should increasingly understand the negotiated and context-specific nature of project portfolio management. The key findings and implications from recent empirical research in portfolio management are summarized in Table 3 and discussed below.

Previous research on strategic decision making has acknowledged that decision making under uncertainty may require quite a different approach than that relying on rationally built systems and procedures (Allaire and Firsirotu, 1989; Eisenhardt and Zbaracki, 1992; Lawrence and Lorsch, 1967). Consequently, Martinsuo (2001) has proposed that power-centered and structural solutions should be considered as additional, alternative perspectives to project portfolio management to account for different levels of uncertainty, besides the rational (technocratic) solution. More recently, the research by Geraldi (2008), Kester et al. (2009, 2011) and Killen et al. (2012) lend support to adopting power-based and structural solutions to project portfolio management. Below, these two viewpoints will be discussed.

4.2. Project portfolio management as negotiation and bargaining

The studies about project portfolio management in practice have shown that managers' actions and managerial decision making involve intuition, negotiation and even bargaining (e.g. Blichfeldt and Eskerod, 2008; Christiansen and Varnes, 2008; Kester et al., 2009, 2011), not accounted for in the frameworks built upon rational project portfolio decision making. Viewing project portfolio management as negotiation and bargaining draws attention to some topics that are not, yet, being investigated sufficiently in association with project portfolio management.

For instance Blichfeldt and Eskerod's (2008) study raises interest towards the *issues that managers generate and face* as part of their negotiation and bargaining process. Where the rational decision making view emphasizes issues that are predefined and known, the viewpoint of negotiation and bargaining would acknowledge also emergent and unknown issues. There are some indications that studies regarding project

Table 3
Summary of emerging issues in recent empirical research on project portfolio management.

Emerging viewpoint in empirical research	Key argument against traditional portfolio management frameworks	Suggested focus for future attention to complement the rational process view
Decision making as an intuitive and negotiative process (besides rational)	Project selection takes place with imperfect knowledge, thus, not following the rational logic of portfolio selection models. Knowledge continues to evolve even after project selection.	Project portfolio management through negotiation and bargaining
Managers' competences in project portfolio management	Managerial decision making is boundedly rational and influenced by situational factors.	Project portfolio management through negotiation and bargaining
Situation-specific action	Project portfolio management is not static but changes based on new information and learning from it.	Project portfolio management through negotiation, bargaining and context-specific reconfiguration
The success of practice depends on the dynamics and complexities in the context	Different types of practices are needed for different contexts — some may be less formalized and rational than others.	Project portfolio management through context-specific reconfiguration
Risks, uncertainties and changes affect the practice	Project portfolio management as adjustment and a way to understand and seize external information to mold decisions and actions.	Project portfolio management through context-specific reconfiguration

management in practice are beginning to reveal relevant issues at the single project level, and how such issues emerge (e.g. Hällgren, 2009), but do not cover the project portfolio level, yet. Similarly, attention could be directed more at the *events and episodes in which the issues emerge and negotiation and bargaining take place*. For example, Christiansen and Varnes (2008) explored decision making events in a firm and how managers negotiated and debated their choices, and Aaltonen (2010) used meeting memos as his main source of data to understand selection and variation processes in the project portfolio. However, besides the formal events and episodes, viewing project portfolio management as negotiation and bargaining encourages revealing what else (less formal and less planned) goes on in the pathways and boardrooms, besides the planned and intended episodes.

Also, negotiation and bargaining implies *influence between people and organizations*, which is little discussed in project-based management. Although influence has been studied in the form of alternative portfolio decision making modes (Loch, 2000), assigning managerial resources and responsibilities to projects (Patanakul and Milosevic, 2006, 2008, 2009), senior management involvement (Unger et al., 2012b) and personal characteristics (McNally et al., 2009), the process of influencing and becoming influenced through issue selling, charismatic power or in-depth expertise could deserve further attention in project portfolio management research. If a lot of portfolio managers' attention goes to prioritizing between different projects, surprisingly little is known about how managers influence each other and bargain with resources and timing to compromise some priorities. Also cross-organizational influences in open innovation portfolios should be considered.

Furthermore, studying the micro-level practice of project portfolio management would imply understanding performance measures other than value maximization, portfolio balance and strategic alignment. Where project portfolio management as rational decision making would expect that the overall goals of portfolio management may be transformed to performance measures and thereby followed, portfolio management as negotiation and bargaining would encourage developing new kinds of measures to estimate more momentary effects in the project portfolio. For example, different measures could be

developed to assess project portfolio stability and project portfolio changes.

If research would explore these issues as part of the practice of project portfolio management, many new viewpoints would likely be discovered, including the opportunity to bring in theoretical lenses e.g. from cognitive theories, agency theory, structuration theory and information processing theory to complement the dominating theoretical bases.

4.3. Project portfolio management as structural reconfiguration

The studies about project portfolio management in context have shown that the surroundings in which the portfolio is being managed influences the possibilities to succeed with certain practices. Additionally, the context is not stable, but rather uncertain and evolving. This contextuality is increasingly well understood, but it is not sufficiently well accounted for in the frameworks built upon rational project portfolio decision making. Evidence from the studied empirical literature suggests that viewing project portfolio management as structural reconfiguration implies increased attention to various inter-project issues, interplay between the projects and the parent organization, and changes that drive reconfiguration.

Although project portfolio management research as such has not directly discussed the dynamics across the projects in the portfolio, the *interplay among projects* in the form of knowledge transfer, technology transfer, and inter-project coordination is increasingly being studied and can be considered as relevant to structural configuring of portfolios. Research on technology-transfer in multi-project contexts (Nobeoka and Cusumano, 1995, 1997), a strong stream of research on the learning across projects (e.g. Bresnen et al., 2004; Newell et al., 2006; Scarbrough et al., 2004), studies looking at organizational complexity in portfolios (e.g. Biedenbach and Müller, 2012; Blomquist and Müller, 2006; Dammer and Gemünden, 2007; Teller et al., 2012) and project overload (Zika-Viktorsson et al., 2006) show evidence that the interplay of projects is quite complex and dynamic and not necessarily possible to fit to rational portfolio frameworks and models. The interactions across projects characterize and mold the structural context in which project portfolio decisions are played

out and, yet, they are poorly accounted for in research on project portfolio management.

Structural configuration also deals with the projects' *interplay with their parent organization*. The parent organizational connection of projects has been suggested as highly strategic to single projects (e.g. [Arto et al., 2008a,b](#); [Martinsuo and Lehtonen, 2009](#)) because of the parent organization's role in setting project goals, offering access to resources and guidance, and sharing of support systems. Such phenomena are highly relevant for the portfolio as well. Particularly the studies by [Perks \(2007\)](#) on inter-functional integration, [Unger et al. \(2012a\)](#) on the role of portfolio management office, and [Müller et al. \(2008\)](#) on governance type as important factors to portfolio management signify that the projects' relationships with the parent organization is highly influential. The parent organization, however, is not a stable context but, rather, one in which portfolio reconfiguration over time is likely and also influences the parent organization. This dynamic relationship is yet to be studied from the perspective of portfolio management.

Changes driving reconfiguration in project portfolios have been considered as relevant both in studies concerning practice and context. Yet, such changes are rarely the main topic of project portfolio studies but more an issue that emerges as part of other content topics. In dynamic environments, project portfolio management may be considered as dynamic capability sensitive to the specific environment and proactive in acquiring external knowledge ([Killen et al., 2012](#)). Where [Martinsuo and Lehtonen \(2007\)](#) emphasized the importance of information availability on single projects to portfolio managers' decision making and [Petit and Hobbs \(2010, Petit 2012\)](#) draw attention to uncertainties and changes and emphasize managers' work as sensing, seizing and transforming, changes at the single project level as well as at the project portfolio level deserve further research.

Similarly as regarding practice, studying the dynamic contexts of project portfolio management would imply developing new kinds of performance measures, to account for the flexibilities needed. For example, such measures could be sought from the context-specific portfolio alignment with goals and strategies (instead of subjective strategic alignment generally) and context-specific (or relative) measures of value and balance.

If research would explore some of these issues as part of the contextuality of project portfolio management, new possible theoretical lenses to complement the dominating theoretical bases of project portfolio management could include, e.g., complexity and evolution theories and institutional theory.

5. Conclusions

5.1. Contributions

This study has offered a systematic review of recent empirical research on project portfolio management particularly accounting for the everyday practice and dynamic context of PPM. The dominating view of portfolio management assumes it as a rational decision process. Although such a viewpoint has its merits in systematizing big firms' product development

processes and promoting their efficiency, also undesirable consequences have been identified. The assumptions underlying rational decision processes are poorly satisfied, when taking the practice and context of portfolio management into account. In conclusion of the literature review, two alternative perspectives are suggested to complement the rational decision process: viewing project portfolio management as negotiation and bargaining, and as structural reconfiguration. Possibilities with these two viewpoints have been briefly discussed, and more research is encouraged to theorize and verify each viewpoint thoroughly.

The results contribute by revealing project portfolio management as a process for and between people, and for and between organizations, besides its service to strategy and products within one organization. Despite the quite obvious linkages between, e.g., project selection and managers' interaction, or project portfolios and project offices, the behavioral and organizational viewpoints have received far too little attention and may well explain some of the problems in achieving PPM success (e.g. [Elonen and Arto, 2003](#); [Engwall and Jerbrant, 2003](#); [Zika-Viktorsson et al., 2006](#)). If previous frameworks have portrayed project portfolio management as a systemic solution to goals and environments that are assumed as static, future research could explore the behavioral and organizational viewpoints that embrace the dynamic and complex nature of practice and context (see also [Gerald, 2008](#)).

A fourth alternative is to look at the combination of reconfiguration and negotiation and see project portfolio management increasingly as a competitive mechanism on capability markets. As companies engage in collaborative product development (open innovation) at the same time as they optimize their resource use among various activities, project portfolio management could be seen as a way to compete for customers' attention by utilizing various practices of power and influence to reconfigure resource settings and, thereby, achieve competitive advantage. Such an externally oriented view to project portfolio management is currently lacking, even if the complex stakeholder environments of projects are being acknowledged at the single-project level ([Arto et al., 2008a,b](#)). Although high-velocity industries already manage internal organizational complexities to respond to their customer needs (e.g. [Brown and Eisenhardt, 1998](#)), hardly any empirical research covers the customer linkages relevant to project portfolio management. Various institutional forces in companies' product development tend to favor technocratic (hierarchical) solutions to project portfolio management.

5.2. Further research towards context-specific project portfolio management in practice

The review has shown that many topics in the practice of project portfolio management have been studied in qualitative settings, with selected case companies and portfolios as the source of data. However, also questionnaire-based hypothetic-deductive studies have been carried out. The contextuality of project portfolio management, in turn, is increasingly being studied either through demanding multi-method studies or through questionnaires. It is fairly apparent that many of the

arguments in recent studies warrant further studies, both to test the findings and to expand the contextual settings to other types of firms and industries.

Besides the ideas presented in the discussion section, five further broad areas are proposed, to encourage further research:

1. Negotiated strategies in and across project portfolios, with focus on the goal-driven, negotiated, and thereby emerging portfolios with cross-organizational linkages.
2. Interplay between practice and context and how managers' contextualized actions result in an unanticipated transformations in the portfolio. Also, how the chosen PPM frameworks are interpreted, enacted and altered, in the day-to-day context of managerial work.
3. Dynamics in project portfolios, with focus on the both the planned and unplanned changes in the portfolio and their systemic, behavioral and organizational influences. Project-level changes that will impact the portfolio, firm level changes that impact the context of the portfolio, changes among partners that will impact the resources of the portfolio's projects, and uncertainties in the broader environment.
4. Evolution of project portfolios and project portfolio management over time, with focus on transitions over time (i.e. project portfolio management as an organizational capability, e.g. Killen and Hunt, 2010) and interplay between the portfolios of a single firm or multiple firms.
5. Multi-project jobs, with focus on the individual's viewpoint to multi-project contexts, including managerial competences, tasks and roles, interface roles, tasks and competences, job designs, and solutions to increase well-being in such roles.

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