Organizing project-based operations

The interplay of content, context and social processes

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Abstract

Project-based organizations (PBOs) are becoming increasingly widespread and important for the modern economy and society. Thus, they attract significant scholarly attention to their distinctive features. The unit of analysis employed by the majority of the studies is the project-based organization as a whole. Hence, the locus of attention stays at the organizational level, whereas project-related effects are discussed in terms of aggregate properties. With very few exceptions, projects as distinct entities do not feature prominently in the discussion of project-based organizations.

This observation creates an interesting paradox. In particular, when projects are discussed as separate units of analysis, their complex organizational dynamics, idiosyncrasies, and institutional embeddedness are among important loci of attention. However, when projects and project collections are discussed within the context of the PBO, the very same aspects tend to be downplayed. Most commonly, projects are either neglected or implicitly assumed to be homogeneous, interchangeable atomic units without internal structure or dynamics, obediently following orders of the parent organizations. Their internal organizational properties are overlooked and the individual-level variables are assumed to have little or no influence on the project outcomes. This thesis questions these assumptions and posits that understanding the dynamics at the project operations level might have important implications for explaining the effectiveness of management arrangements in the PBO.

In particular, this thesis aims to explore the factors that shape project-based operations in the setting of the project-based organization. The thesis examines three particular factors which affect organizing of the project-based operations: (1) the content of operations; (2) the context of operations; and (3) the social processes at the operational level. Structurally, the thesis comprises a cover essay and four appended papers (three of them published in international peer-reviewed journals).

Largely inductive in nature, the thesis builds on two research studies. The first study represents an in-depth “insider” case study of project-based operations in the Operations division of a large pharmaceutical company. It employs a
combination of data collection methods, including semi-structured interviews, participant observations, and document analysis. The second study represents a structured framework-based literature review. Recognizing the organizational properties of projects, the thesis draws upon several literature streams within organization theory and design to analyze the empirical data. The results elaborate how the organizing of project-based operations in the PBO is shaped by the interplay between the content, intra-organizational and wider institutional contexts, as well as endogenous social processes.

The thesis contributes to the literature on project-based organizations by developing an institutional, as well as extending a contingency perspective on organizing project-based operations. Further, the results call for revisiting the conceptualization of the PBO by questioning the view of projects as atomic and homogeneous units. Finally, the thesis contributes to the literature by developing an organization design perspective on the PBO.

In terms of managerial implications, the thesis offers a few frameworks which can be used to support the decision-making process in a PBO. In particular, Paper I develops a contingency model of program management competences (the 3C model), Paper II derives a framework that can help PBO managers in evaluating the sources of isomorphic pressure on individual projects and programs, while Paper IV puts forth an organization design model for the PBO. At a more general level, Paper II discusses how the identified isomorphic processes within the PBO can limit flexibility, innovation, and efficiency. Finally, the cover essay discusses the important factors that need to be scrutinized in order to assess organizing of the project-based operations, such as the technical content, the project landscape and social landscape or the influence of institutionalized practices and models.

**Keywords:** project-based operations; project-based organization; PBO; contingency; new institutionalism; organization theory; organization design.
Sammanfattning


Mer specifikt så syftar denna avhandling till att utforska de faktorer som formar verksamheten i projektbaserade organisationer. Avhandlingen undersöker tre särskilda faktorer som påverkar organisering av projektbaserade operationer: (1) verksamhetsinnehållet, (2) verksamhets sammanhang och (3) de sociala processerna på en operativ nivå. Strukturellt består avhandlingen av en kappa och fyra bifogade papper (tre av dem publicerade i internationella peer-review journaler).

Forskningen är av induktiv natur och avhandlingen bygger på två studier. Den första studien representerar en fördjupad fallstudie av den projektbaserade verksamheten i ett stort läkemedelsföretag. Den studien har genomförts med hjälp av en kombination av datainsamlingsmetoder, till exempel semi-strukturerade intervjuer, deltagande observationer och dokumentanalys. Den
andra studien representerar en strukturerad ramverksbaserad litteraturstudie. För att erkänna vikten av projektens organisatoriska egenskaper i PBOs baseras avhandlingen på flera olika litteraturområden inom både organisationsteori och empirisk dataanalys. Resultaten utvecklar hur organiseringen av projektbaserade verksamheter i PBOs formas av samspelet mellan projektens innehåll, intraorganisatoriska och bredare institutionella sammanhang samt endogena sociala processer.


Vad gäller det praktiska bidraget så erbjuder avhandlingen några ramverk som kan användas för att stödja beslutsprocessen i en PBO. Speciellt i papper I så utvecklas en beredskapsmodell för programledningskompetens (3C-modellen). I papper II skapas ett ramverk som kan hjälpa PBO-chefer att utvärdera källorna till isomorft tryck på enskilda projekt och program, medan Paper IV presenterar en modell för organisationsdesign av projektbaserade organisationer. På en mer generell nivå diskuterar papper II också hur de identifierade isomorfa processerna inom en PBO kan begränsa flexibilitet, innovation och effektivitet. Slutfilen diskuterar kappan de viktiga faktorer som behöver granskas för att bedöma organiseringen av projektbaserade verksamheter, såsom det tekniska innehållet, projektlandskapet och det sociala landskapet eller påverkan av institutionaliserade metoder och modeller.

**Nyckelord:** projektbaserade verksamhet; projektbaserade organisation; PBO; contingency ("situationsanpassad") teori; nyinstitutionell teori; organisationsteori; organisationsdesign.
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Maxim Miterer,
Stockholm, the 1st of May, 2017
List of appended papers

This thesis is based on four papers that are enclosed at the end.

Paper I


Paper II


Paper III


Paper IV

List of selected additional publications (not appended)


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1. Introduction

1.1. Setting the stage: The project-based organization and its importance as a research area

This thesis addresses the issue of organizing project-based operations in the context of the project-based organization. The focus is on project-based organizations as lasting organizational entities that use projects and project constellations, such as programs and portfolios, as the main principle for organizing work (see Hobday, 2000; Lindkvist, 2004), rather than one-off project-based enterprises representing project-specific legal entities that dissolve after the project completion (see DeFillippi and Arthur, 1998), or project networks based on alliances between multiple organizations and individuals (Sydow and Staber, 2002; Windeler and Sydow, 2001).

Management of such project-based organizations is an important research topic due to the wide dissemination of this organizational form and its idiosyncratic challenges. First, project-based organizations are becoming increasingly widespread and important for the modern economy and society (Cattani et al., 2011; Lundin et al., 2015; Whittington et al., 1999). Project-based organizations are the dominant form of organizing production across a number of industries, such as construction (Bresnen et al., 2004; Kadefors, 1995), media and entertainment (DeFillippi and Arthur, 1998; Windeler and Sydow, 2001), as well as engineering and production of complex products and systems (Davies and Brady, 2000; Eriksson et al., 2002; Prencipe and Tell, 2001). Additionally, projects and project-based units often play a role of organizational devices for product development, R&D, and organizational renewal, and for this reason seem indispensable even within the industries that have not traditionally relied on projects, such as the automotive (Cusumano and Nobeoka, 1998; Midler, 2013, 1995), healthcare (Aubry et al., 2014), telecommunication (Jerbrant, 2013; Lindkvist et al., 1998), logistics (Söderlund, 2008), packaging (Lindkvist, 2004), pharmaceutical (Freilich, 2015), and computer technologies (Brown and Eisenhardt, 1997; Loufrani-Fedida and Saglietto, 2016), to name a few.
Second, a number of studies emphasized the differences between project-based and more traditional forms of organizations (Söderlund and Tell, 2011; Sydow et al., 2004) which complicate the direct transfer of assumptions and conclusions established for other types of organizations to the project-based context (Blindenbach-Driessen and Van den Ende, 2010; Bredin, 2008; Maylor et al., 2015). For example, the success factors and best practices for development projects differ between project-based and functionally organized firms (Blindenbach-Driessen and Van den Ende, 2010, 2006). Also, the structural separation between work carried out in projects and evaluation procedures performed by line functions creates challenges for matching compensation to performance (Bredin and Söderlund, 2006). Along the same lines, the traditional ways of designing reward systems and motivating employees do not apply in the project-based context, since many project-oriented engineers are not interested in traditional management and technical career ladders (Allen and Katz, 1995). To conclude, a number of studies have indicated that a lack of attention to the idiosyncrasies of project-based settings can negatively affect such important areas as innovation, operations, and long-term organizational learning (e.g., Ekstedt et al., 1999; DeFillippi, 2001; Keegan and Turner, 2002, 2001; Maylor et al., 2015). Consequently, relying on traditional management and organization theories can hinder designing well-functioning systems, if one omits to take the aforementioned differences into account.

Overall, the ongoing burgeoning of the form combined with a number of the intrinsic challenges makes project-based organizations an interesting and important phenomenon to study. When addressing these challenges, researchers should be cautious in relying on existing theories of management and organization, since the form is associated with a number of important idiosyncrasies (Söderlund and Tell, 2011).
1.2. Where are projects in the discussion of project-based organizations?

During the past decade, project-based organizations have attracted significant scholarly attention (Cattani et al., 2011). Major research themes within the topic include the distinctions of the project-based organization from more traditional types of organization (Söderlund and Tell, 2011), the implications of temporary character of projects for innovation (Gann and Salter, 2000; Keegan and Turner, 2002), organizational learning and knowledge management (Grabher, 2004; Keegan and Turner, 2001; Marshall and Brady, 2001; Prencipe and Tell, 2001; Söderlund, 2008), and organizational capabilities (Brady and Davies, 2004; Davies and Brady, 2016, 2000; Nightingale et al., 2011), as well as typologies of project-based organizations (Hobday, 2000; Whitley, 2006).

The unit of analysis employed by many of the studies is the project-based organization as a whole. The locus of attention stays at the organizational level, whereas project-related effects are discussed in terms of aggregate properties, such as decentralization, short-term performance orientation and distributed work practices (e.g., Bresnen et al., 2004). With very few exceptions, projects as distinct entities do not feature prominently in the discussion of project-based organizations. Most commonly, they are either neglected or implicitly assumed to be homogeneous, interchangeable atomic units without internal structure or dynamics, obediently following orders of the parent organization.

This observation creates an interesting paradox in regard to conceptualization of projects, which is reflected in the duality of assumptions about project behavior, factors determining project-related dynamics, and appropriate theoretical lens. In particular, when projects are discussed as separate units of analysis, among the most salient loci of attention are their organizational dynamics (Engwall and Westling, 2004; Lundin and Söderholm, 1995; Packendorff, 1995), idiosyncrasies (Dvir et al., 1998; Lechler and Dvir, 2010; Shenhar, 2001; Shenhar and Dvir, 1996), and institutional embeddedness (Ferriani et al., 2009; Ruuska et al., 2011). Projects are shown to be different
from each other, as a result of either some intrinsic properties (Shenhar and Dvir, 1996) or influences of organizational history and context (Engwall, 2003). They are also embedded in multi-layer social structures that affect learning, management structures and dissemination of practices (Bechky, 2006; Ferriani et al., 2009, 2005; Grabher, 2004; Windeler and Sydow, 2001), and experience wider institutional pressure (Engwall, 2003; Kadefors, 1995; Lampel, 2011).

However, when projects and project collections are discussed within the context of PBO, the very same factors tend to be overlooked or downplayed by the aforementioned assumptions. The focus shifts to standardized solutions (Ahola et al., 2014) applied to identical and interchangeable projects within the PBO. Projects are often depicted as obedient servants of the parent organization, representing tactical means to execute organizational strategy (Artto et al., 2008). Their internal dynamics are overlooked and the individual-level variables are assumed to have little or no influence on the project outcomes.

Two lines of reasoning could potentially justify the latter approach. Either these assumptions about projects in the PBO are universally valid, or the project operations level of analysis is not relevant for the discussion of the phenomena at the organizational level.

Neither of the options appear to be well justified. There are few empirical studies that address internal dynamics of multiple projects in the PBO, rather the literature rests on a set of implicit assumptions. Regarding the homogeneity assumption, a number of studies documented the existence of project-based organizations comprising a heterogeneous set of projects, for example, in terms of scale, importance, technical content etc. (Elonen and Artto, 2003; Engwall, 2003; Engwall and Jerbrant, 2003; Freilich, 2015; Geraldi, 2009; Jerbrant, 2009). A typical example might include a Project Management Office (PMO) carrying out a wide range of organizational renewal initiatives. Thus, the homogeneity assumption of the literature on PBOs is not universally valid.
On the second point, the literature does contain some examples where the inclusion of projects as a unit of analysis and/or questioning some of the assumptions outlined above provided novel insights for the dynamics of the project-based operations as a whole. Indeed, the contextual differences between projects executed within the same PBO can explain the effectiveness of different management approaches (Engwall, 2003). The existence of different types of complexity in projects (Geraldi et al., 2011; Geraldi and Adlbrecht, 2007) as well as different types of projects in the portfolio affect organizational design of the project-based firm since “such heterogeneity demands structures with different degrees of flexibility” (Geraldi, 2008, p. 349). Heterogeneity of projects can also be instrumental in explaining failures of introduction of new management practices in the PBO context (Bresnen et al., 2004). Moreover, the multi-level perspective informs our understanding of learning within the PBO (Prencipe and Tell, 2001). At a higher level of abstraction, there is a growing trend of explaining phenomena in the fields of strategic management and organization theory by utilizing constructs at a lower level of analysis and/or building upon methodological individualism (Felin et al., 2015).

Therefore, the importance of understanding project operations dynamics and its implications in the context of the PBO is supported by theoretical and methodological arguments. Persistence in neglecting factors that shape project-based operations might lead to building theories of the project-based organization upon contestable assumptions and having a number of negative consequences, such as poor design choices, challenges in introducing new management practices (Bresnen et al., 2004) or misfits in management approaches (Engwall, 2003).

To conclude, in spite of some scholars positing that project-based organization has to be studied as a multi-dimensional and multi-level phenomenon (Söderlund et al., 2014; Sydow et al., 2004), the operational level (i.e., the level of projects and groups of projects) is not sufficiently addressed within the scholarly discussion of project-based organizations. This appears to be both unjustified and detrimental to understanding of project-based organization dynamics.
1.3. Research purpose and research questions

The overall purpose of this thesis is to explore how project-based operations are shaped in the setting of the PBO.

Management scholars have long recognized the importance of content, context and social processes for understanding organizational dynamics (Pettigrew, 1987). Along the same lines, a number of studies corroborated the importance of these aspects within the realm of projects and project-based management (cf. Blomquist and Packendorff, 1998). In particular, the intrinsic characteristics of projects (i.e., project content) play an important role as explanatory variables within the contingency stream of project management (Hanisch and Wald, 2012; Sauser et al., 2009; Shenhar, 2001; Shenhar and Dvir, 1996). At the same time, projects are embedded in their organizational and wider institutional contexts (Engwall, 2003; Grabher, 2004; Morris and Geraldi, 2011). Within the contextual stream of the literature, a number of studies have shown the influence of such embeddedness on interior project processes and project outcomes (Bakker, 2010). Along the same vein, context has also been recognized as an important determinant of practices at the level of project collections, such as programs and portfolios (Martinsuo, 2013; Pellegrinelli et al., 2007). Finally, project researchers are increasingly cognizant of the importance of intra-organizational social interactions and their effects on organizational outcomes of project-based organizations, such as those of learning and performance (Bartsch et al., 2013; Di Vincenzo and Mascia, 2012; Prencipe and Tell, 2001).
Building on these threads in the literature, this study investigates three particular dimensions: the content, context, and social processes. Specifically, it aims to answer three research questions (RQs) within the setting of the project-based organization:

RQ1: How are project-based operations shaped by their content?

RQ2: How are project-based operations shaped by their context?

RQ3: How are project-based operations shaped by the social processes?

1.4. Structure of the thesis

Following the Introduction, Chapter 2 presents the theoretical background of the study. In particular, it commences by discussing the state-of-the art of research on project-based organizations and the underlying premises of the literature. It highlights contestable assumptions about projects in the discussion of project-based operations, and reviews studies which benefited from a multi-level inquiry. Finally, it briefly discusses factors that could affect the operational level of the PBO based on extant literature. Chapter 3 discusses the overall research design of the thesis and describes the data collection and analysis. Chapter 4 summarizes the four appended papers and provides an overview of the author’s contribution to each of the papers. Chapter 5 synthesizes the paper results to answer the research questions outlined in the Introduction. In Chapter 6, the thesis results are put in a broader context by discussing the theoretical and managerial implications of the findings. Chapter 7 recapitulates the thesis and restates its theoretical contribution. Finally, the appended papers comprise an integral part of the compilation thesis. The structure of the thesis is summarized in Figure 1.
Figure 1. Structure of the thesis

*OTD – Organization Theory and Design
2. Theoretical background

2.1. Project-based organization

The project-based organization has become an indispensable organizational form in the present-day economy (Lundin et al., 2015; Whittington et al., 1999). Specific factors that determine the wide dissemination of project-based organizational logic include its suitability for customized operations (Hobday, 2000), ability to integrate diverse knowledge and skill sets (Hedlund, 1994), its adaptation, exploration and experimentation capacity (Brown and Eisenhardt, 1997; Lindkvist, 2008; Siggelkow and Levinthal, 2003), the time-based nature of competition in many markets, and the existence of strong performance incentives in smaller, “molecular” organizational units (Zenger and Hesterly, 1997). Moreover, project-based organizations provide an opportunity for infusing market elements of governance into hierarchies and vice versa (Lindkvist, 2004; Zenger and Hesterly, 1997), exploiting advantages of both traditional modes of governance. Accordingly, introduction of project-based management as an organizational innovation is driven both by internal complexity of operations and external competitive and institutional pressure (Martinsuo et al., 2006).

The project-based form of organizing is not a panacea though, as it entails a number of distinct challenges. Specifically, the temporal character of projects poses strong challenges to long-term organizational learning, knowledge management and innovation (Davies and Hobday, 2005; DeFillippi, 2001; Keegan and Turner, 2002; Prencipe and Tell, 2001; Sydow et al., 2004). Additionally, a multi-project environment creates conditions for a fierce competition over limited organizational resources (Engwall and Jerbrant, 2003), tensions with line functions due to incompatibility of the permanent and temporary organizational logics and principles (Arvidsson, 2009), and psychologically stressful work conditions (Palm and Lindahl, 2015; Zika-Viktorsson et al., 2006). On top of it, the complex political landscape of a project-based organization can jeopardize implementation of new management practices and thus hinder organizational renewal (Bresnen et al., 2004).
To complicate the matter further, project-based forms of organization are examined in the literature under various conceptual terms, such as project-based organization (Hobday, 2000; Turner and Keegan, 2001; Lundin et al., 2015), multi-project organization (Canonico and Söderlund, 2010), multi-project firm (Geraldi, 2009, 2008), projectified matrix organization (Arvidsson, 2009), project-based firm (Artto and Kujala, 2008; Lindkvist, 2004; Whitley, 2006), multi-project environment (Eskerod, 1996), and project-oriented company (Gareis, 1991), to name a few.

The differences are not solely linguistic, as project-based organizational structures exist in a rich variety of forms and configurations (Cattani et al., 2011; Hobday, 2000; Whitley, 2006). Probably the most common approach is to draw a distinction between the organizational forms based on the distribution of decision-making authority among projects and functional units (Galbraith, 1971; Larson and Gobeli, 1988; Wheelwright and Clark, 1992). For example, Hobday (2000) distinguishes between project-led and project-based organizations based on the role played by projects. While in project-based organizations most internal and external activities are structured as projects, in project-led organizations they play an important supporting role in largely non-project-based productive activities. Similarly, the degree to which projects represent key organizational activities is central to many classifications. Arvidsson (2009) differentiates between project-based organizations, relying on projects as sources of revenues, and project-oriented organizations, where revenues are generated by permanent structures and processes that are supported by projects. Along the same line, Turner and Keegan (2001) make a distinction between the project-based organizations where projects are used to supply bespoke products and services to external customers (Type 1), and the ones where they play a supporting role to a mainly routine core business (Type 2). In another typology, Whitley (2006) proposes four distinct project-based forms of organization, differentiating between them based on the singularity of goals and outputs and the separation and stability of work roles. Recently, by conducting a comprehensive review of these and other sources, Lundin et al. (2015) have introduced project-based organizations (PBOs) as the ones delivering projects as their business, and contrasted them with project-supported organizations (PSOs) which
increasingly rely on projects in the traditional, internal parts of their organization.

While acknowledging this diversity, this thesis follows more inclusive definitions by Lindkvist (2004) and Canonico and Söderlund (2010). Thus, this thesis defines the project-based organization as one which organizes most of its activities by projects. It can represent either a firm delivering projects to external customers or a project-based organizational unit within a larger firm (e.g., Canonico & Söderlund, 2010; Fricke & Shenhar, 2000).

2.2. Projects in the PBO discourse

Somewhat counterintuitively, projects receive limited attention in the literature on project-based organizations. On one hand, projects are often included in conceptual or empirical analysis by the scholars emphasizing the multi-level nature of the project-based organization (Biesenthal and Wilden, 2014; Loufrani-Fedida and Saglietto, 2016; Müller, 2016; Pemsel et al., 2016; Prencipe and Tell, 2001). On the other hand, the literature carries a number of implicit questionable assumptions about the nature of projects populating a PBO, with important consequences for the range of theories utilized by researchers to explore the intra-organizational processes and the validity of the resulting models of the PBO.

Specifically, the PBO literature predominantly views projects as homogeneous, interchangeable atomic units without internal structure or dynamics, obediently following orders of the parent organizations. They are viewed as localized practices or specific processes or devices to deliver tasks, rather than temporary organizations (cf. Lundin and Söderholm, 1995; Packendorff, 1995). Consequently, organizational properties of projects are neglected in the discourse. The lack of attention to the organizational properties of projects has three important implications for extant theorizing on the PBO.

First, it contributes to a narrower range of theories utilized to explain intra-organizational dynamics of the PBO. For example, the emphasis is often on theories such as agency and Transaction Cost Economics (Müller, 2009) in
order to explain organization-project interaction, whereas organization theories, including contingency and institutional theory, are rarely applied to explain phenomena at the operational level within the PBO (for some exceptions, see Bergman et al., 2013; Engwall, 2003).

Second, it leads to an implicit assumption of the homogeneity of projects within a single PBO. Indeed, if projects are atomic units, they can then be more readily viewed as similar and interchangeable. This consideration, in turn, results in the focus on standardized management approaches and arrangements within the PBO (Ahola et al., 2014).

Third, it is conductive to the view that projects are obedient servants of the parent organization (Artto et al., 2008). In particular, PBOs are often conceptualized as rational systems set up for making decisions at the level of the parent organization and ensuring that they are fulfilled at the level of project-based operations, with the overarching aim of achieving efficiency and strategic alignment (Morris & Jamieson, 2005).

There are, however, important exceptions to this view that pay attention to the organizational properties of projects or reject some of the assumptions summarized above. Specifically, the assumption of homogeneity of projects has been challenged in the literature. For example, by distinguishing between vanguard and subsequent exploitation projects, Brady and Davies (2004) provided important insights into project capability building when moving into a new technological or market base. In a similar vein, heterogeneity of projects can be instrumental in explaining failures of introduction of new management practices in the PBO context (Bresnen et al., 2004). Accordingly, zooming in on projects as organizational entities can help in explaining the effectiveness of different management approaches in terms of organizational context and history (Engwall, 2003), or in suggesting a novel conceptualization of the PBO as a loosely-coupled system with important implications for understanding the organizational dynamics of the PBO (Bergman et al., 2013).

In line with the discussion presented above, this thesis builds on studies that acknowledge heterogeneity of projects within the PBO and treat them as
organizations (Bergman et al., 2013; Lundin and Söderholm, 1995), rather than a distinct type of operational processes.

2.3. Factors shaping project-based operations

Project-based operations is a term which is commonly used yet rarely defined. Recently, it has been defined as a type of operations characterized by low-medium volume and medium-high variety (Maylor et al., 2015, p.106), or simply described in terms of the steps constituting a typical process from winning the customer’s order to maintaining support after delivery (Turner and Keegan, 2000). In this thesis, the concept of project-based operations is defined more broadly as operational activities that are deliberately structured in projects and their collections, and managed by applying PM tools. In that sense, project-based operations do not represent an objective reality inevitably stemming from the nature of the output and process of operations, but rather they reflect the framing of the phenomenon by managers and researchers.

For two decades now, the contingency stream within the project management literature has recognized the importance of addressing project characteristics and their influence on appropriate management approaches (Engwall, 2003; Dvir et al., 1998; Howell et al., 2010; Lindkvist et al., 1998; Pich et al., 2002; Sauser et al., 2009; Shenhar, 2001; Shenhar and Dvir, 1996). In a recent study, Howell et al. (2010) identified five groups of project contingency factors in the literature: uncertainty, complexity (as “the degree of differentiation and interdependence of project elements” (ibid, p. 258)), team empowerment, criticality, and urgency. Even though the contingency perspective at the multi-project level is less developed (Howell et al., 2010), some relevant contributions come from contingency studies of management control in multi-project organizations (Canonico and Söderlund, 2010), portfolio management (Martinsuo, 2013), as well as studies highlighting specific aspects of project governance, such as its relation to knowledge integration (Lindkvist, 2011).

Furthermore, within the project contingency research, scholars of the environmental stream, such as Lawrence and Lorsch (1967), Mintzberg (1979), and Thompson (1967), provide a theoretical foundation for the
studies (Hanisch and Wald, 2012). As a result, “the contingency factors environmental uncertainty and the organization surrounding the temporary organization attract the most attention” (ibid, p. 12). In the same vein, the complexity and dynamism of project environment has been identified as an important factor for adopting appropriate governance approaches and management tools (Locatelli et al., 2014; Taxén and Lilliesköld, 2008). With many important exceptions (Lindkvist et al., 1998; Shenhar and Dvir, 2007; Turner and Cochrane, 1993), intrinsic factors, such as those related to characteristics of the project task, are less explored as possible contingency variables. For example, the factors identified by Howell et al. (2010) are in line with the environmental orientation of project contingency theory and show some neglect for the technology perspective and the ways in which actual project work is done. It should be noted though, that the overlooking of actual work is not a unique feature of the project management research (Barley and Kunda, 2001).

At the same time, history along with organizational and wider institutional contexts has strong effects on management of projects within the PBO (Engwall, 2003; Grabher, 2004). Besides the influence of such embeddedness on interior project processes and project outcomes (Bakker, 2010), it is also related to long-term learning and knowledge management at the level of parent organization (Cacciatori, 2008; Grabher, 2004; Grabher and Ibert, 2011; Prencipe and Tell, 2001). Such embeddedness also results in continuity of project roles across subsequent projects (Bechky, 2006). Along the same lines, the organizational context has also been recognized as an important factor affecting project collections, such as programs and portfolios (Martinsuo, 2013; Pellegrinelli et al., 2007).

Finally, project researchers are increasingly cognizant of the importance of intra- and inter-organizational social interactions and their role as determinants of project outcomes. For example, Ferriani et al. (2009) identified that the degree of centrality in the social network is positively associated with the performance of project-entrepreneurs. Moreover, the social capital reflected in intra-organizational social ties of project team members has been positively associated with learning (Bartsch et al., 2013), as
well as knowledge integration and performance (Di Vincenzo and Mascia, 2012; Prencipe and Tell, 2001).

To summarize, the extant literature, when focusing on projects as separate units of analysis, indicates the importance of project characteristics, context embeddedness, and social interactions as the determinants of project management arrangements. Taking this as a point of departure, the thesis investigates how these three dimensions affect project-based operations, and discusses the implications for management of the PBO.
3. Research approach and methodology

This chapter addresses the methodology followed to answer the research questions and discusses the related research design choices. Upon introducing the overall research design in the first section, the chapter provides details of two research studies constituting the backbone of the thesis in two following sections. In particular, it provides a discussion of the research design, data collection and analysis, measures taken to support reliability and validity of the results, and limitations of each of the studies.

3.1. Overall research design

The nature of the compilation PhD thesis has a bearing on methodological issues. Each appended paper follows its own research method to answer paper-specific research questions. Table 1 provides a summary of methods employed in the appended papers, including the details of research methodology, the theoretical perspective taken, and the correspondence between the papers’ research questions and the research questions of the thesis. This section discusses overall research approach of the thesis as a whole at a more aggregate level, without delving into particular issues of data collection and analysis pertinent to the separate papers.

It is important to conceive and study the project-based organization as a multi-level and multi-dimensional phenomenon (Hällgren and Lindahl, 2012; Pemsel et al., 2016; Söderlund et al., 2014). Following this call, the papers included in the compilation thesis focused on two different levels of analysis. While some papers focused on the level of a project or a collection of projects, others focused on the level of the parent organization as a whole. The approach spanning several levels within the PBO allowed assessing both the higher-level intentions behind the arrangements utilized in order to organize certain activities, and the work content affecting the efficacy of the arrangements. Moreover, this approach allowed comparing the perspectives of the actors at different levels in the PBO with regard to the arrangements. The papers included in the thesis employed different specific units of analysis, such as management competence areas or isomorphic mechanisms. At the
same time, the overall unit of analysis for the thesis is project-based operations within the project-based organization.

The overall research approach of the thesis had a significant inductive component and can be viewed as “abductive” (Dubois and Gadde, 2002), which means that no specific hypotheses were formulated based on extant literature prior to commencing data collection. Instead, the initial intention was to gain an in-depth understanding of project-based operations and factors affecting various intra-organizational governance arrangements (in a broad sense). The explorative character of research is in line with the identified theoretical problem of overlooking projects as organizational entities in the discourse on PBOs. However, the research was not purely inductive. First, the PhD candidate has brought various preconceptions based on prior professional experience, as well as ideas from the initial review of the literature, into the research process (Alvesson and Sköldberg, 2009). Additionally, the research process involved iterative interactions between theory and the data (Eisenhardt, 1989; Eisenhardt and Graebner, 2007).

In line with the multi-level and abductive nature of the research, the thesis builds on two principal research studies: an in-depth ethnography-inspired case study (Study A), and a structured literature review (Study B). As shown in Table 1, Study A resulted in Paper I and Paper II, while Paper III and Paper IV were based on the data collected in Study B.

The case study strategy employed in Study A was particularly suitable for pursuing an in-depth understanding of complex social phenomena (Eisenhardt, 1989; Siggelkow, 2007; Yin, 2009). The data was collected using multiple techniques and analyzed qualitatively. Each paper followed its own process of data categorization. The data was not used for generalization in the statistical sense, rather for understanding and theory-building (Eisenhardt and Graebner, 2007; Flyvbjerg, 2006; Yin, 2009). The two following sections provide more details about the research studies.

Another feature of the research design is theory triangulation (Denzin, 2006). The appended papers highlighted different aspects of the empirical phenomenon borrowing from a range of perspectives within organization
theory and design, with an emphasis on contingency and new institutionalism in organizational analysis. Using various theoretical lenses to explore the phenomenon strengthened the validity of the findings (Yin, 2009), since tensions and contradictions between rival explanations provide a more complete view of a phenomenon (Brady and Maylor, 2010; Poole and Van de Ven, 1989).

3.2. Study A: “Insider” case study

Research design

Study A had an insider-outsider design (Bartunek and Louis, 1996). The PhD candidate was acting as an insider, closely following the company managers in accordance with the ethnographically inspired approach (Fetterman, 2010). The case study lasted from September 2013 to July 2014. The most intense data collection period occurred over four months (October 2013 – January 2014), with additional sporadic interactions both before and after the active phase. During the active phase, the PhD candidate had a desk at the company office and access to the facilities, permitting him to observe employees in their work environment and interact freely with them. In turn, the supervisors contributed with external observations from a distance, acting as outsiders (Bartunek and Louis, 1996). The insider and the outsiders held a number of meetings to discuss their observations, ideas and plans for further empirical work.

The rationale for a single case study in this research is the representative or typical case (Yin, 2009). In particular, the case organization needed to fulfil two criteria to be selected: (1) to execute a major part of its activities by projects (either a project business (Davies and Hobday, 2005) or a project-based unit of a large company (Canonico & Söderlund, 2010)), (2) to be large enough to run many projects and allow variation in their characteristics. Further, the study employed an embedded case study design (Yin, 2009), as it addressed several units of analysis within the PBO.
Table 1. Summary of methods in the appended papers

<table>
<thead>
<tr>
<th>Topic</th>
<th>Paper I</th>
<th>Paper II</th>
<th>Paper III</th>
<th>Paper IV</th>
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<tbody>
<tr>
<td>Exploring program management competences for different programs</td>
<td>Exploring isomorphic mechanisms within the PBO</td>
<td>Evaluating the state-of-the-art of research on PBOs by applying an organization design perspective</td>
<td>Developing a model for the PBO design</td>
<td></td>
</tr>
<tr>
<td>Topic</td>
<td>Paper I</td>
<td>Paper II</td>
<td>Paper III</td>
<td>Paper IV</td>
</tr>
<tr>
<td>Level of analysis</td>
<td>Project-based operations</td>
<td>Parent organization &amp; project-based operations</td>
<td>Parent organization</td>
<td>Parent organization &amp; project-based operations</td>
</tr>
<tr>
<td>Unit of analysis</td>
<td>Management competence areas</td>
<td>Isomorphic mechanisms</td>
<td>Organization design dimensions</td>
<td>Organization design dimensions</td>
</tr>
<tr>
<td>Research study</td>
<td>Study A: Case study</td>
<td>Study B: Structured literature review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific research approach</td>
<td>In-depth ethnography-inspired single case study</td>
<td>In-depth ethnography-inspired single case study</td>
<td>Framework-based literature review</td>
<td>Conceptual reasoning &amp; Framework-based literature review</td>
</tr>
<tr>
<td>Research study</td>
<td>Study A: Case study</td>
<td>Study B: Structured literature review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theoretical perspective</td>
<td>Contingency</td>
<td>Institutional</td>
<td>Org. theory and design (several research streams)</td>
<td>Org. theory and design (several research streams)</td>
</tr>
<tr>
<td>Research Questions (RQs) in the papers</td>
<td>Q1. How are various competence areas associated with successful program management for different program types?</td>
<td>Q1. How are various aspects of project organization design shaped in the PBO?</td>
<td>Q1. What are the key dimensions of the design of the PBO in the PM literature? Q2. Which dimensions and research themes receive most and least attention in the PM literature? Q3. To what extent does the literature consider interdependencies of separate organization design dimensions?</td>
<td>Q1. What design choices are available for the design of the PBO? Q2. What factors influence the selection of design choices?</td>
</tr>
<tr>
<td>Related RQs of the thesis</td>
<td>RQ1, RQ2</td>
<td>RQ2, RQ3</td>
<td>RQ1, RQ2</td>
<td>RQ1, RQ2</td>
</tr>
</tbody>
</table>
A brief overview of the empirical setting

The study was conducted as an in-depth case study at the Operations division of a major pharmaceutical company. The project work in the division was managed separately in different organizational units. While the company as a whole can be best described as a project-supported organization (see Lundin et al., 2015), these organizational units were clearly project-based. The units covered by the study included the ones connected to the areas of new product development, manufacturing, and supply chain. Most of the interviews were conducted in relation to the latter unit, while the data on new product development and manufacturing units provided a wider overview of the organizational setting, allowing for cross-unit comparisons. Within the supply chain unit, program management approach had been used for a range of change initiatives within the company. Consequently, the study mainly concentrated on the program level with some additional insights coming from other relevant sources such as project or portfolio managers, as well as program sponsors.

The case covered a range of different projects and programs. The set of initiatives included supply chain reconfiguration, regulatory compliance, ERP implementation, establishing alliances with other pharmaceutical companies, and new market entry (including building new large-scale plants). The broad geographical coverage of the projects and programs (including Asia, North America, Europe, and North Africa) represented a distinct feature of the operations.

Data collection

Throughout the study, the data on a range of management and governance arrangements was collected, including structures, such as steering committees, and the way they work; control mechanisms, such as special audit groups; rules and policies, such as the program prioritization framework, program management guide, and integrated framework of project and program assurance; roles, for example, division of the decision-making authority between project managers, program manager, and the steering group; and
practices, for example, project management methodologies applied, and to what extent they were followed.

In order to acquire a comprehensive view on the subject and to enhance the study’s validity (Yin, 2009), several data collection methods were utilized, namely, semi-structured interviews, document analysis, and participant observations. The data collected during the study is summarized in Table 2.

The study incorporated extensive participant observations of the organization’s everyday routines, management meetings and informal communication. The PhD candidate spent 30 full working days of participant observations at the company’s head office during the four most active months of the study (in total around 240 hours of participant observations). Every day spent on site resulted in field notes, with one to four pages of bullet point quotes and notes on informal interactions with the staff and subsequent related reflections. The participant observation comprised seven management meetings lasting between 1.5 and 4 hours, including two ordinary work meetings for two programs and five division-wide meetings on the development of program management capability. Additionally, the introductory meetings with the managers where the scope of research activities was discussed provided additional data. The findings drawn from this extensive data were confirmed by the Company’s managers during several interim presentations and two worldwide webinars conducted by the PhD Candidate.

Semi-structured interviews also represented an important source of data. The initial set of programs and respective interviewees was identified together with the Company representatives, ensuring representation of a wide range of programs in terms of types of missions and geographical locations. Later on in the process, the interviewees were asked to provide further contacts to reduce the initial selection bias. In total, 19 semi-structured interviews were conducted with program managers, program sponsors, project and portfolio managers, and other actors. The interviews lasted on average slightly over one hour, with the exception of the interviews at the executive level, which lasted between 30 and 40 minutes.
The interviews were complemented with the analysis of two broad document categories: program-specific and general. The first category included internal audit reports, overview presentations, internal organization and escalation matrices, lessons learned and program management tools, such as risk logs. The second category included the internal guidelines and frameworks for the project, program and portfolio management within the unit and across the Company.

**Table 2. Summary of data collection in the case study**

<table>
<thead>
<tr>
<th>Data collection method</th>
<th>Data collected</th>
</tr>
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<tbody>
<tr>
<td><strong>Semi-structured interviews</strong></td>
<td>19 interviews with program managers and other relevant actors (e.g., program sponsors, portfolio managers, project managers). Average duration was slightly over one hour.</td>
</tr>
</tbody>
</table>
| **Participant observations**  | The PhD student spent 2-3 days per week at the company office conducting participant observations:  
  ➢ 30 days (approx. 240 hours) of participant observations
  ➢ 7 formal management meetings (lasting between 1.5 and 4 hours each)
  ➢ Extensive informal communication
  ➢ Field notes for each of the days spent on site |
| **Documents analysis**        | In total, more than 30 documents:  
  ➢ Internal program documents (internal audit reports, overview presentations, internal organization and escalation matrices, lessons learned, and program management tools)
  ➢ Organization-wide guidelines and frameworks for project, program and portfolio management |
| **Other**                    | 7 research-related meetings with managers:  
  ➢ Two kick-off meetings
  ➢ Three interim presentation and feedback meetings
  ➢ Two global webinars with Q&A sessions on the research results |
Data analysis

The data analysis for both papers that emerged from Study A followed the overall logic of a process which could be metaphorically labeled as an application of a method theory to a domain theory (Lukka and Vinnari, 2014). A domain theory here refers to a certain set of knowledge on a specific topic, while a method theory corresponds to a “meta-level conceptual system,” which is useful to study the domain theory (ibid, p. 1309). In Paper I the domain theory represented the literature on program management competences, while the method theory was the contingency perspective. In Paper II, the domain theory represented the literature addressing organization design choices at the project level within the PBO, while the new institutionalism within organizational analysis played the role of the method theory.

The collected data was analyzed qualitatively through pattern matching, allowing the relating of concepts from the domain theory and method theory. Each paper followed its own process of data categorization, which is described in the respective papers in more detail. The data was not used for the generalization in the statistical sense at this stage, rather for understanding and theory-building (Eisenhardt and Graebner, 2007; Flyvbjerg, 2006).

The validity and reliability of the findings were corroborated by several means, which are discussed in the appended papers in more detail. First, the data allowed for triangulation, using various sources and data collection techniques (Yin, 2009). Second, the conclusions drawn from the data were validated with the company’s managers during several workshops and worldwide webinars at the company. Minor corrections were made based on the comments received during these meetings. However, the papers’ coauthors assumed the responsibility for the final interpretation.
3.3. Limitations of Study A

The main limitation of the study is related to the extent of generalizability of its findings. In particular, the empirical foundation of the thesis represents an in-depth insider embedded case study. This might potentially represent a challenge to the generalizability, as the differences in the organizational context have been found to have significant effects on the project-based operations (Martinsuo, 2013; Müller et al., 2008; Pellegrinelli et al., 2007). Some scholars even hold a view that such contextual differences, for example, based on the industrial sector, might justify a different set of appropriate approaches to theorizing about PM phenomena (Artto et al., 2017). While such concerns should be taken seriously, they do not undermine the importance of an in-depth qualitative investigation of a social phenomenon, and the theory-building opportunities that it provides (Barley, 2006; Eisenhardt, 1989; Yin, 2009).

Thus, the thesis does not claim generalizability of the findings in any statistical sense. However, it does aim to achieve analytic generalization, that is “to expand and generalize theories… and not to enumerate frequencies” (Yin, 2009, p. 15). Nonetheless, there are reasons to believe that the conclusions established in the case might be valid for other PBOs. For example, the projects and programs investigated within the embedded case study represented a diverse sample in terms of the technical content and cultural context (see Paper I), supporting the validity of the findings. Further, the highly regulated context of the pharmaceutical industry and the culture of compliance might have amplified the strength of isomorphic processes (see Paper II). However, there are no reasons to believe that the identified relationships would be absent in a different PBO. On the contrary, the diverse set of investigated entities makes us expect even stronger isomorphism in more homogeneous PBOs, such as within a construction company or a consulting company. Indeed, existing empirical studies carried out in the construction industry seem to support this view (Ekstedt et al., 1992; Kadefors, 1995).

Nevertheless, the thesis propositions need to be validated in further empirical studies to achieve generalizability. In particular, it would be promising to use
a multiple case study or a survey methodology across various industrial sectors.

Another limitation of the study is related to its relatively short duration, with the most intensive data collection being carried out within four months. This time span allowed observation of certain changes in organizing project-based operations, such as the introduction of new management arrangements. However, it was not enough to evaluate the long-term effects of the changes. Additionally, the social structure remained relatively stable over the observation period. This has limited the ability to investigate the explanatory power of social processes as a determinant of the project-based operations’ arrangements. Thus, future studies on the topic might benefit from a longitudinal approach.

3.4. Study B: Structured literature review

Overall approach

Study B was based on a specific structured literature review approach that has been defined as a framework-based review for understanding (Rowe, 2014), which is similar to a perspectival literature review (Schryen et al., 2015). The approach rests on utilizing a conceptual framework to conduct literature selection and analysis (e.g., Kappos and Rivard, 2008). By adopting a new perspective as a synthesizing tool, the approach aims to contribute to a knowledge domain with a novel interpretation of an extant literature (Schryen et al., 2015). This is achieved “by applying new angles or different macro-concepts that enable a view which has not previously been explicated” (Schryen et al., 2015, p. 4). The application of this structured framework-based approach is becoming popular in various areas of management research (Besson and Rowe, 2012; Brown and Grant, 2005; Burgess et al., 2006; Jasperson et al., 2002; Welch and Paavilainen-Mäntymäki, 2014).

The framework-based literature review has a number of distinct features. First, it emphasizes the role of a conceptual framework and its elements for identifying knowledge gaps and various preconceptions in the literature (Besson and Rowe, 2012; Rowe, 2014). Suggesting a novel interpretation of
the literature often represents an important outcome of the approach (Schryen et al., 2015). In particular, applying a conceptual framework enables synthesizing literature via “abstracting in order to classify and make sense of sets of research pieces within broad categories, which deal with similar problems at a certain level” (Rowe, 2014, p. 248). Consequently, instead of providing a detailed account of individual contributions, the approach puts an emphasis on the analytical categories and their interrelationship. For that reason, the framework-based approach is often based on a systematic literature review (Rowe, 2014).

Second, the approach aims to make a distinct contribution to the literature by externalizing existing knowledge and by explicitly framing it as a different theoretical problem (Schryen et al., 2015). Specifically, in case of Study B, such novelty is related to discussing a theoretical problem of the design of the project-based organization. Therefore, the study goes beyond reviewing and recapitulating the literature. In addition to the adoption of a new perspective itself, framework-based reviews can also contribute to the literature by identifying research gaps or by suggesting a research agenda (Schryen et al., 2015).

Finally, the framework-based review aiming at theoretical understanding required medium level of systematicity in terms of the inclusion criteria and quality assessment (Rowe, 2014). Since in this case the focus was on suggesting a new interpretation, rather than on presenting a detailed account of separate contributions in the literature, the review entailed a reasonable rather than a comprehensive coverage, without compromising its contribution (Rowe, 2014). Moreover, in the case of a multi-faceted research topic, where the key concepts and research themes are not known upfront, a keywords-based systematic literature review could have resulted in omitting important research themes.

The following two sub-sections describe the steps that were taken to identify and analyze the papers.
Literature sample

This section presents a rationale for the methodological choices made in order to reach the final sample of papers for the analysis. These choices were related to the choice of journals, the approach to identify individual papers from the journals, and the time horizon.

In order to select journals for the analysis, the existing literature reviews in the field of PM were consulted. Three journals, i.e., International Journal of Project Management, Project Management Journal and International Journal of Managing Projects in Business, appeared to hold leading positions as specialized PM journals. According to Ahola et al. (2014, p. 1322), “these three journals are widely recognized as leading outlets for publishing project-specific academic research.” Similarly, Turner et al. (2011) suggested International Journal of Project Management, Project Management Journal and the IEEE Transactions on Engineering Management as the three major journals in the field, while the International Journal of Managing Projects in Business was new when they were writing. The inclusion of the IEEE Transactions on Engineering Management as an important journal for the sample is also justified by the fact that it has been an outlet for influential papers on PM for the past 30 years (Larson and Gobeli, 1989; Lechler and Dvir, 2010; Müller et al., 2012; Pinto and Mantel, 1990; Shenhar, 1998; Williams, 2008). Combining the two lists, four peer-reviewed academic journals in the project management field were selected for the study:

- The International Journal of Project Management, (IJPM)
- The Project Management Journal, (PMJ)
- The project management division of the IEEE Transactions on Engineering Management, (IEEE TEM)
- The International Journal of Managing Projects in Business, (IJMPiB)
While limiting the sample to four journals excluded some important contributions, it is believed to fit the purpose of the study. First, it allowed characterizing the specialized project-specific literature, which is useful per se. Second, it was aligned with the chosen approach of selecting individual papers as explained below.

The approach of identifying individual papers for the sample was designed taking into account the multifaceted character of the research on the topic of the design of the project-based organization. In particular, since a rich variety of concepts are being used to discuss, for example, organizational arrangements in the realm of PBOs, employing a literature search based on a (limited) predefined set of keywords was considered inappropriate. Consequently, in order to identify an inclusive sample of papers, all issues published in the journals were examined one by one.

In order to define the time horizon for the study, it was taken into account that Artto and Kujala (2008) published a comprehensive review of the current state of project business research in 2008, which focused on the management of a project-based firm as a key research area. Thus, in order to review the most recent literature on the topic to allow for comparisons, the time horizon for the review included eight years between 2008 and 2015 (Study B was conducted in the end of 2015).

To summarize, Study B reviewed project management literature dating from 2008, in order to identify papers related to the design of the project-based organization. The journal sample included four leading peer-reviewed academic journals on PM, for which the coauthors of Papers III & IV selected all articles that were considered relevant to the topic of the management and/or design of PBOs. The final sample of papers was formed by merging the lists of papers collected individually by the researchers. As a result, 177 papers were identified for further review and analysis.
Literature review and analysis

Paper analysis comprised four steps. First, simultaneously with the paper selection process, the coauthors assessed the papers independently. For each paper, the bibliographic data, major results, key dimensions or mechanisms studied, which organization design dimensions of the conceptual framework the paper considered, and the research focus regarding the dimensions were recorded. The entries were organized as a concept matrix (Webster and Watson, 2002). In particular, the list of the sampled papers was put in the first column, while the selected organization design dimensions represented the headings of the remaining columns. In order to fill out the concept matrix, the coauthors recorded the specific research themes for each of the organization design dimensions addressed in the papers. At this stage, the themes were formulated by the coauthors idiosyncratically, in their own words.

Second, four working sessions were organized. At these sessions, the coauthors jointly scrutinized the combined list of papers in order to: (1) discuss all issues and finalize the sample, (2) discuss the initial categorization of the papers based on the dimensions they addressed, and (3) develop a common set of research themes covered in the papers. The process was iterative in nature and aimed at reducing the effect of individual biases. Overall, this step resulted in a table of 177 articles classified according to a set of the identified 35 research themes. Based on the table the coauthors mapped most common research themes into the organization design framework.

Third, the coauthors carried out a descriptive analysis of the sample. In particular, they identified the number of appearances of each organization design dimension and research theme in the paper sample as a proxy for relative development of the research direction. Then, the coauthors analyzed the sample based on the number of design dimensions covered by the papers in order to determine how holistic the papers were. Finally, an in-depth qualitative analysis of the most holistic papers was performed. Overall, the analysis achieved the purpose of identifying organization design dimensions for the PBO.
3.5. Limitations of Study B

The most important limitation of Study B is related to the choice of the academic outlets for the analysis. As it can be seen from the Introduction and the Theoretical background chapters of this thesis, many relevant contributions related to the management of the PBO as a whole appeared in general management, innovation and organization theory journals. Some examples of reputed journals which occasionally publish papers on the topic of PBO include Research Policy, Organization Studies, Long Range Planning, and Scandinavian Journal of Management, among others. It is understood that an inclusion of contributions from these journals in the sample would result in a more comprehensive coverage. Nevertheless, it is believed that the chosen sample allowed for covering most of the relevant contributions, since project-related publications in general management journals are still relatively scarce (Bakker, 2010). Also, the choice of specialized PM journals for the study allowed for characterizing the research done in the community of PM scholars, rather than organization theory scholars interested in the project-based form as an empirical setting.

In addition, the study involved certain subjective choices made by the coauthors. These include choosing the Galbraith’s Star model as the analytical framework for the analysis and classifying the papers according to the organization design dimensions they covered. In particular, the classification process included a subjective evaluation of whether a paper is addressing a dimension in-depth or just referring to it. While, as discussed in the previous section, certain steps were taken to reduce such bias, the final set of identified research themes still represents the outcome of an interpretative process. Nevertheless, the implications of the study are believed to be robust, since they were drawn from the analysis of a large sample of the papers, and changes in the classification of the individual papers are unlikely to affect the general conclusions.
4. Summary of the appended papers

This chapter briefly presents the summaries of the four appended papers. The distribution of work among the authors for each paper is described in Table 3.

Table 3. Authors’ contributions to the appended papers

<table>
<thead>
<tr>
<th>Paper</th>
<th>Order of authors</th>
<th>Authors’ contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Miterev, Engwall, Jerbrant</td>
<td>The study design was carried out by Miterev and Jerbrant. Miterev collected and analyzed the data, while Engwall and Jerbrant contributed with their reflections. The paper was mainly co-written by Miterev and Engwall, with Miterev as the main contributor. Jerbrant contributed valuable ideas during the discussions.</td>
</tr>
<tr>
<td>II</td>
<td>Miterev</td>
<td>As a single author, Miterev conceived the study, collected and analyzed the data and wrote the paper. The work was carried out under supervision of Engwall and Jerbrant, who contributed valuable ideas.</td>
</tr>
<tr>
<td>III</td>
<td>Miterev, Turner, Mancini</td>
<td>Planning was carried out by all authors based on an idea proposed by Miterev. Turner and Miterev equally contributed to the data collection and analysis. The paper was mainly co-written by Miterev and Turner, with Miterev as the main contributor. Mancini contributed valuable ideas during the discussions.</td>
</tr>
<tr>
<td>IV</td>
<td>Miterev, Mancini, Turner</td>
<td>Planning was carried out by all authors based on an idea proposed by Miterev. Turner and Miterev equally contributed to the data collection and analysis. The paper was mainly co-written by Miterev and Turner. Mancini contributed valuable ideas during the discussions.</td>
</tr>
</tbody>
</table>
Paper I

Purpose – The purpose of this paper was to explore how various program management competences are associated with successful program management.

Methodology – Overall, the study built on the results of an in-depth case study (Study A). The study had an insider-outsider design (Bartunek and Louis, 1996), with one of the authors acting as insider who closely followed the program managers using an ethnographically inspired approach (Fetterman, 2010). Several data collection methods and multiple data sources were used (Yin, 2009), such as participant observations, semi-structured interviews, and document analysis. The data analysis included several steps. In the first step, the programs were classified into three categories according to Pellegrinelli's (1997) typology, based on the type of benefits arising from the coordinated management of projects. In the second step, the distinct program management competence areas for each of the program types were identified. In line with our inductive approach, we chose to derive competence areas directly from the empirical data and not limit the analysis by applying a single competence framework from the literature. Finally, after reviewing the resulting sets of individual competence areas, we conceptualized them into three distinct core management roles for each of the program types.

Findings – The findings suggested that various program settings place distinctively different demands on program managers, thus requiring different competence profiles to cope with them. Building on Pellegrinelli's (1997) typology, the study developed a contingency competence model that links specific competence profiles to the program types. The conceptual framework represents the 3C model, comprising the Coordinator, Commander and Convincer management roles, each with its own set of attributes that are linked to successful management of particular program types.
Research implications – By establishing the link between the program typologies literature and program management competence literature, the paper showed that programs should not be treated as a generic and homogeneous category in discussions on program management competences. In addition, the findings highlighted program content as a salient contingency variable for understanding program management dynamics.

Originality/value – The paper provided a rare empirical example of the contingency approach to program management generally, and to program management competence in particular. Additionally, it also covered a wide range of geographical settings and inductively explored microfoundations of successful management in a research area dominated by quantitative studies.

Contribution to the thesis – The paper contributed to the understanding of the contingency logic at the level of project-based operations.
Paper II

**Purpose** – The purpose of this paper was to explore how the project-level organizational arrangements is shaped by institutional forces within project-based organizations.

**Methodology** – Overall, the study built on the results of an in-depth case study (Study A). The study had an insider-outsider design (Bartunek and Louis, 1996), with the paper author acting as an insider who closely followed the program managers using an ethnographically inspired approach (Fetterman, 2010). Several data collection methods and multiple data sources were used (Yin, 2009), such as participant observations, semi-structured interviews, and document analysis. The data analysis started with the development of a theoretical framework, which built on the developed conceptualization of project organization design as comprising strategy, structure, processes, and people, on one hand, and on the other hand, on three isomorphic processes: coercive, mimetic and normative. By analyzing rich empirical data, the study explicated specific mechanisms that are responsible for the isomorphic pressure for each of the aspects of temporary organization design.

**Findings** – The findings suggested that projects tend to imitate each other’s structures, strategies and practices with little consideration of the potential performance effects. Different mechanisms were found to be at play for different elements of organization design. In turn, the institutions were not permanent rules of the game. The study also briefly discussed ways in which project managers shape institutions around them. Thus, it showed how individual-level attributes of organizational actors and idiosyncrasies of relational structure affect institutional set-up and isomorphic processes.
**Research implications** – The paper challenged the dominant yet implicit assumption of goal rationality behind the design of temporary organizations within project-based organizations. It also provided important implications for the conceptualization of the project-based organization. Finally, it extended application of the institutional theory to intra-organizational aspects by focusing on the organizational fields of multiple temporary organizations within the project-based organization.

**Originality/value** – To the best of my knowledge, this was one of the first attempts to apply institutional logic to project organization arrangements (or design dimensions) within a parent project-based organization.

**Contribution to the thesis** – The paper added an institutional explanation to the factors shaping project-based operations. It also contributed to the notion of the organizational context by clarifying the roles played by other projects as well as the parent organization as explanans of project arrangements.
Paper III

Purpose – The purpose of this paper was to evaluate the state-of-the-art of research on project-based organizations by applying an organization design lens.

Methodology – The paper followed a structured framework-based literature review approach (Rowe, 2014). It built upon an analytical framework from the organization design literature in order to analyze 177 papers that were published in four leading PM journals between 2008 and 2015, and are relevant to the design of the project-based organization. The analysis includes four stages. During the first stage, the authors reviewed the papers individually while focusing on the organizational design dimensions and research themes covered by the papers. The second stage comprised four joint working sessions, where the authors reviewed and reconciled their individual results in order to iteratively arrive at a common set of research themes. Then, the themes were used to propose a framework mapping the research themes into an organization design framework. During the third stage, the authors conducted a quantitative analysis of the sample to evaluate the extent of holistic orientation of the papers. Finally, they qualitatively analyzed the more holistic papers.

Findings – The paper illustrates how the organization design lens can provide a valuable research perspective on the project-based organization. The results showed that the literature on project-based organizations downplays broader organizational issues, such as organizational strategy, incentive schemes, and performance management systems, while emphasizing research agenda inherited from research on single-project management, such as individual management competences, governance structures, and management processes. In addition, the study highlighted limited attention in the literature to the interdependence between separate design choices. This finding contrasts with the importance attached to design interdependencies within the general management literature. Finally, the study developed a research framework to map current themes in the literature and their relative importance, as well as discussed a prospective research agenda.
**Research implications** – Academic implications stemmed from looking at the project management literature from a fresh theoretical perspective and putting the project-based organization as a whole in focus. There is great research potential in studying organization-wide aspects and interdependencies between various organization design choices in project-based organizations.

**Originality/value** – The paper offered a novel way of conceptualizing research on project-based organizations by linking it to an established stream within the field of organization theory and design.

**Contribution to the thesis** – The paper illustrated the capacity of the organization design lens. It also identified various organization design choices relevant for project-based organizations, and contributed to the understanding of multi-level interactions within a PBO.
Paper IV

**Purpose** – The purpose of this conceptual paper was to develop a holistic model for the design of the project-based organization.

**Methodology** – As a conceptual paper, this paper combined conceptual reasoning with the analysis of extant literature. It identified and discussed concepts and perspectives that are useful for developing a model, in particular, contingency, configuration and complementarity, holistic models of organization design and conceptualization of the firm as a web of temporary organizations. It further reviewed the literature on organization design to choose a design model as an analytical framework providing the basis for literature analysis. Then, it discussed distinct characteristics of the project-based context and argued for a contingency approach to the design of the project-based organization. Finally, it reviewed what has been written in the project management literature since 2008 about the management of project-based organizations, and categorized the topics in the papers according to a modified version of the Galbraith’s Star Model.

**Findings** – The paper found that many researchers have written about individual elements of the Star Model, but very few have written about their interdependency and the holistic design of project-based organizations. We also identified contingency factors that affect project-based organization design, and adapted the Star Model to reflect those.

**Research implications** – The organization design research stream can provide a fresh, yet almost unexplored potential to enhance the studies of organizational aspects of project-based organizations.

**Originality/value** – To the best of our knowledge, this was one of the first attempts to treat the design of the project-based organization holistically. It also provided an overview of how various sub-streams of organization theory and design could be helpful in developing knowledge about the design of the project-based organization.
Contribution to the thesis – The paper conceptualized the project-based organization as a web of temporary organizations, and thus countered the literature on PBOs viewing projects merely as distinct business processes, and therefore neglecting their organizational properties. It also provided arguments for a contingency approach as an important foundation for understanding PBOs, as well as called attention to interdependencies among various design dimensions and levels in the PBO.
5. Synthesis of the results

The aim of the thesis is to explore how project-based operations are shaped in the setting of the PBO. In order to address this question, this chapter synthesizes the thesis findings to answer the research questions. Consequently, it is structured along the three themes introduced in Chapter 1, i.e., (1) content, (2) context, and (3) social processes. In order to facilitate the reading, the correspondence between the research questions and the appended papers is presented in Table 4. Finally, the findings are summarized in Figure 2 in the end of the chapter.

Table 4. Correspondence between the appended papers and thesis research questions

<table>
<thead>
<tr>
<th>Research themes</th>
<th>Paper I</th>
<th>Paper II</th>
<th>Paper III</th>
<th>Paper IV</th>
<th>Synthesis (cover essay)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The role of content in shaping project-based operations (RQ1)</td>
<td>✓ ✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Project-based operations' arrangements are influenced by three complementary effects of content of task and activities, intra-organizational and institutional context, and endogenous social dynamics.</td>
</tr>
<tr>
<td>The role of context in shaping project-based operations (RQ2)</td>
<td>✓ ✓ ✓ ✓ ✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>The role of social processes in shaping project-based operations (RQ3)</td>
<td></td>
<td>✓ ✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.1. Content

RQ1: How are project-based operations shaped by their content?

The findings identify two ways in which the content shaped the project-based operations: (1) by influencing appropriate management approaches of individual projects and programs and (2) by affecting organization-wide arrangements.

First, at the case company, the intrinsic characteristics of activities that needed to be completed during a project or a program determined appropriate management arrangements. In particular, Paper I showed that different program types required distinct sets of management competences to manage them successfully. For example, programs aiming to exploit a common theme (e.g., common knowledge, resources, or infrastructure) among relatively independent projects required effective coordination of distributed activities. That put stronger demands on the managers to be able to create transparency of the issues within the program through informal influencing, distilling key information, structuring information flow across projects, and exercising flexibility. In comparison, programs pursuing creation of one-off outcomes outside standard organizational routines (e.g., a new product or a plant) required managers to be effective in decision making, directing, planning, controlling, staffing and team building, as well as in providing technical expertise based on their experience. Finally, programs seeking to improve existing systems or processes asked for the ability to navigate complex political context, master scenario planning, act as the program ambassador, and to influence decisions through a wide personal network. As suggested by Paper I, a misfit between program type and manager competence profile led to tensions and challenges, while alignment facilitated successful program delivery. Consequently, the findings show that the intrinsic program properties, which are referred to here as program content, affected appropriate management arrangements.

Similarly, the case study findings show that the projects’ arrangements were influenced by the content. In particular, in some programs, the program managers had different requirements for different projects in terms of
following the company’s project management guidelines. This flexibility was exercised unofficially, as all projects were supposed to follow the same process and prepare the same set of documents and reports. However, for smaller projects, or when the project manager did not have enough project management experience (e.g., being recruited from a functional unit), some program managers made an exception. Hence, the size of the project, as well as its resource base, influenced the way the operations were managed. In addition, the differences among projects in terms of level of risk, degree of interdependency with other projects as well as the level of complexity led to differences in governance arrangements, both in terms of existence of formal structures and level of attention from program managers. This was reflected for instance in differences in frequency of the project steering group meetings for different projects, and even in the absence of separate steering groups for some minor projects. Furthermore, while only limited managerial attention was paid to some projects, other projects required the program manager to be deeply involved in active risk tracking and resolving issues. Consequently, the variation in the projects’ contents had significant effects on how they were managed.

In turn, Papers III & IV discussed the contingency perspective at the level of projects, project collections, and the parent organization itself, as an important foundation of project-based organization design. Within organization theory, technology (which is often understood as the nature of operational activities) represents a classic contingency variable (Perrow, 1967; Thompson, 1967; Woodward, 1965). Consequently, Papers III & IV also indirectly emphasize the importance of the content of project-based operations.

Overall, these findings are in line with management studies emphasizing intrinsic properties of an activity as a determinant of its management structures and approaches (e.g., Birkinshaw et al., 2002; Nickerson et al., 2012; Sanchez and Mahoney, 1996). Similarly, the project management researchers have investigated such intrinsic determinants as the project type (Shenhar and Dvir, 1996), key knowledge integration challenge (Enberg, 2007), complexity of the problem (Ahern et al., 2014), and uncertainty in goals and methods (Turner and Cochrane, 1993).
Consequently, the results indicate that project or program content represents an important determinant of project-based operations. In particular, building on the empirical findings and previous research, the thesis highlights the characteristics of the task as a determinant of project and program management arrangements.

Second, besides the influence of the content on the management arrangements of separate projects and programs, the heterogeneity of the portfolio, which consisted of various projects and programs, had important implications for managing the project-based operations. In particular, evident tensions between the diversity of project/program content and standardized management structures and procedures had two consequences for the project-based operations. During the case study, the growing awareness of the management team about the differences among program types resulted in the establishment of a new organizational unit responsible for running goal-oriented programs. This organizational measure aimed at achieving structural separation of more homogeneous sub-portfolios of projects to help resolve the tensions between the customized demands of project-based operations and the standardized organization-wide guidelines. In addition, there were active discussions on possible further changes to the program management guidelines in order to acknowledge the diverse nature of the programs. Furthermore, as the findings showed, in cases when the standardized guidelines did not fit the nature of the project task, this led to a decoupling of actual operations from the prescribed formal procedures. Consequently, differences in the content led to avoidance of the standardized formal procedures and guidelines.

The findings indicate that uniform solutions and guidelines will, ceteris paribus, result in lower performance if applied on a non-homogeneous set of projects and programs (Bresnen et al., 2004). More flexible approaches should be preferable in case of such heterogeneous portfolios, either in terms of a higher flexibility of organization-wide guidelines and frameworks, or in terms of a higher degree of discretion for managers that allows improvising (Jerbrant and Gustavsson, 2013).
To summarize, the findings showed how, when considering projects or programs in isolation, the efficiency pressure determines the way in which project-based operations need to be organized in order to achieve the fit between the content of projects and programs and their management arrangements.

5.2. Context

RQ2: *How are project-based operations shaped by their context?*

The influence of the context on project-based operations is discussed in two layers: the intra-organizational context and the wider institutional context.

*Intra-organizational context*

The current findings suggest that project-based operations are strongly affected by the organizational arrangements at the level of the PBO. As Paper II showed, coercive mechanisms in the case had significant effects on the project-based operations. In particular, the superior entities affected project-based operations in two ways: (1) by prescribing formal management structures and approaches for project, program, and portfolio management, such as the program capability guide or project portfolio prioritization framework, and (2) by creating informal expectations about the expected outcomes and the process by which they should be reached (Paper II). As shown in Paper II, these prescriptions, in combination with a multi-level assurance system, put pressure on projects and programs to follow the procedures. Along the same lines, Papers III & IV emphasized the importance of fit between organizational design choices made at the level of the parent organization and at the level of projects. That means, for example, that a need to contribute to a declared organizational strategy puts a limit on the range of the decisions a project manager is considering while devising the project strategy. Taken together, these findings showed how various aspects of management of project-based operations were shaped by the top-down pressure from superior organizational structures.
At the same time, in the case study, the relationship between operational and organizational levels was reciprocal. Specifically, some project and program managers were successful in getting their approaches enacted as formalized best practices (Paper II). These formalized structures, in turn, affected the subsequent project-based operations. Moreover, some program managers were very skillful in navigating the political context in order to influence decisions made at the organizational level as, for instance, by orchestrating the steering group composition for their programs (Paper I). Consequently, besides the identification of direct top-down influences on the project-based operations, the findings indicate how these effects were mediated by the actions of some managers.

In addition to these hierarchical influences, horizontal linkages also played an important role in shaping the project-based operations. In particular, non-project based functional units affected the operations directly, for example, due to the HR department’s involvement in hiring, assessment, and promotion decisions and via participation in the steering groups (Papers I & II). Besides, the functional units also affected the operations indirectly by putting requirements on the technical content of the work (Paper II). As an example, the marketing department’s decision on packaging solutions for various markets had implications on how the work was structured within the product development projects (Papers I & II). Consequently, the project-based operations were shaped by the functional units through the supply of key resources (such as personnel) while retaining a partial control over them, by direct participation in key decisions, as well as by controlling the technical content.

**Wider institutional context**

The approaches and arrangements utilized within the studied project-based operations were also influenced by the wider institutional context at the societal and industry levels. As discussed in Paper II, the studied project-based operations were shaped by a number of institutional forces. For example, the management toolbox of the project and program managers was mainly formed by popular models, frameworks, and approaches, such as the Ishikawa diagram and the A3 problem-solving approach (Paper II). Thus,
availability and legitimacy of popular management models affected the operations. In addition, accepted societal norms and priorities also affected the way programs were managed. Particularly, the issues of sustainability were included in many of the program documents and discussed during the meetings (Paper II). Besides, the tradition of heavy regulations in the pharmaceutical industry led to heavy documentation and prescriptions being viewed as a norm, thus affecting the amount of paperwork a program team had to fulfil (Paper II). On top of it, project and program managers represented a relatively homogeneous group in terms of educational background, professional experience, and personality traits (Paper II). Finally, even though the managers were rarely members of the professional PM associations, they widely consulted material such as the Project Management Institute’s Project Management Body of Knowledge while developing their own guidelines and frameworks (Paper II). Consequently, the wider institutional context had significant effects on processes, structures and strategies of the projects and programs.

To summarize, the findings identified two layers of context for the project-based operations and illustrated their effects on the management arrangements. The first layer represents the intra-organizational context and comprises both superior entities which overlook the project-based operations and non-project based units within the company. The second layer represents the wider institutional environment of the company. It shapes project-based operations by the availability of popular management models, influence of professional associations and consulting companies, existence of shared industry-specific norms and practices, and influence of common societal values and norms on decision-making. Taken together, the two contextual layers had a strong impact on how project-based operations were carried out.
5.3. Social processes

**RQ3:** *How are project-based operations shaped by the social processes?*

The final element which emerged from the study is related to social processes at the level of project-based operations. This element is endogenous to project-based operations and takes into account the internal social structure at the levels of projects and individuals.

*“Project landscape”*

The findings indicated the existence of imitation among various projects and programs (Paper II). Despite the differences in goals, scale, and technical content of operations (Papers I & II), it was common to copy structures, frameworks, approaches and even configuration of the steering groups. Findings of Paper II discussed the existence of an informal hierarchy among projects which affected the legitimacy and appeal of their project management practices. As a result, some projects and programs functioned as role models for others.

Two factors appear to be of significant importance in determining the status of a project or program. First, the perception of success was one of the key factors shaping the process. Individuals engaged in projects and programs tended to imitate approaches utilized by initiatives which were perceived to be success stories. For example, program managers of successful programs were approached both directly and through competence networks to provide advice on how a program could be structured, or to share a certain framework or tool. Another factor conducive to being the role model was related to the scale and complexity of projects and programs. Large initiatives gained higher visibility and credibility within the organization, and their approaches and structures were imitated more often. These processes were facilitated by the mandatory lessons learned sessions, and dissemination of brief reports after program completion. Overall, these considerations highlight the role of legitimacy and availability in the dissemination of management models. To that end, project-based operations are influenced by the configuration (or landscape) of projects and programs (Paper II). These findings relate to the
importance of prestige, legitimacy, and uniqueness of projects as explanans of their internal dynamics (cf. Engwall, 2003). However, the distinct feature of the current study is that it associates the perceived characteristics of projects with their role as objects of imitation by other projects (Paper II).

“Social landscape”

At the level of individuals, the social landscape played an important role in the mimetic processes. Similar to the project status discussed above, the empirical findings indicate the existence of an informal hierarchy of managers related to their perceived successfulness and expertise (Paper II). As the findings indicate, management structures, frameworks, tools and approaches were disseminated through formal and informal competence networks from the “champion” managers to all others. Additionally, individual-level proximity, including connections arising from, for instance, friendship, co-location, experience of working together and commonality of interests in organizational politics, played important roles in this process. In particular, such proximity enabled more frequent communication and a deeper level of trust between the managers belonging to the same group. As a result, management approaches were commonly copied from the leaders of these groups. Consequently, the findings suggest three factors as important determinants of the position in the informal hierarchy of managers: experience, perceived successfulness, and centrality in certain groups of managers.

The informal hierarchy in the case organization was dynamic, as several program managers exerted efforts to promote themselves as the most experienced and legitimate role models (Paper II). This was achieved by establishing connections with superiors, active participation in the intra-organizational competence networks, and disseminating their own approaches as best practices. Overall, the informal social configuration mediated the effects of context and content, and thus shaped the project-based operations. These findings are in agreement with and elaborate on prior studies highlighting the importance of intra-organizational social ties for explaining dissemination of project practices (cf. Bartsch et al., 2013; Di Vincenzo and Mascia, 2012; Prencipe and Tell, 2001).
To summarize, the findings identified endogenous social processes as an important determinant of project-based operations. In particular, individuals engaged in various projects in the PBO tended to imitate each other’s management structures and approaches. This imitation was conditioned by three main social processes: (1) sharing of tools and approaches by managers via formal and informal competence networks within the company, (2) interpretation of organization-level arrangements and guidelines within groups of managers, and (3) promotion and institutionalization of best practices as formal guidelines by the most ambitious managers. These processes were profoundly affected by the informal hierarchies of projects and individuals, determining the direction of dissemination of project and program management arrangements.

5.4. The interplay of the factors

Based on the findings of the appended papers, the role of content, context and social processes in shaping project-based operations could be summarized as depicted in Figure 2. Firstly, the figure acknowledges the diversity of content of projects and programs (shown with different shapes for symbols depicting the temporary organizations), and illustrates its implications for managing the project-based operations. As the findings suggest, the characteristics of the task that a project or program is set to accomplish affect the way the operations need to be managed in order to achieve success (shown with green color). In addition, awareness about the diversity of content can lead to structural adjustments, such as creation of a new organizational unit to run a sub-portfolio of particular types of projects or programs (see Figure 2). Secondly, the figure shows the reciprocal influences between the operations and their context. In particular, the figure depicts how the wider institutional context affects the operations, by providing a management toolbox and creating a normative pressure on project participants (shown in the upper part of Figure 2). Moreover, the intra-organizational context affects the operations in two ways. Superior organizational entities impose various frameworks and guidelines on the temporary organizations, as well as form informal expectations about how they ought to be managed. In addition, non-project based organizational units
affect the operations by exercising control over various technical aspects of
the projects and by providing project participants and steering group
members who retain their connections to the units. In turn, the operations
influence the intra-organizational context in three ways: by the emergence and
institutionalization of best practices, by affecting organizational politics, and
by leading structural adjustments. Finally, the figure highlights the role of
endogenous social processes in shaping project-based operations. In
particular, it depicts the imitation processes as borrowing of structures and
approaches among projects and individuals (shown with small black arrows
in Figure 2). The project landscape and social landscape play an important role in
these processes by determining which projects and individuals become role
models for others. As shown in the figure, the position in the informal
hierarchy is related to the level of successfalsness, visibility, and centrality to
certain groups or coalitions.

There is a complex interplay between the identified factors and the way
project-based operations are managed. For example, the present findings
indicate that the various functional departments of the organization – related
to the context dimension – indirectly influence the project-based operations
by exercising control over the technical content and providing project
participants. Similarly, the institutionalization of organizational best practices
– as an outcome of the endogenous social processes – defines parts of the
intra-organizational context for subsequent operations. Consequently, the
identified factors are not independent and should be seen as complementary
in explanation of the phenomenon.

Despite being a static representation of the PBO, the diagram implies a
dynamic nature of these processes. In particular, it depicts reciprocal
influences between the temporary and permanent organizational structures
which unfold in time. For example, the institutionalized best practices emerge
from their application in some projects and programs, depend on the past
social landscape (connection to the past), and are imposed on the subsequent
projects as formal guidelines (connection to the future). Similarly, the
structural adjustments arise from the tensions between uniform guidelines
and customized demands of projects (connection to the past), thus resulting
in a new intra-organizational context for future projects in the PBO
(connection to the future). Finally, the social structure itself is dynamic as individuals get promoted, transferred into other units, get assigned to more/less successful projects, leave the company, establish new connections, and so forth. Thus, the findings support the importance of the organizational history and path dependency in explaining project-based phenomena (Engwall, 2003; Leonard-Barton, 1992).
Figure 2. Summary of the findings
6. Implications

The previous chapter synthesized the findings of the appended papers in answering the research questions. Derived primarily from a single, embedded case study, these findings have some obvious limitations (discussed in Chapter 3). Consequently, further research is needed to rectify the identified concepts and relationships and to validate the findings in other contexts before they can be claimed to have general validity in a statistical sense. However, assuming that the findings are generally valid, the present chapter discusses some of the findings’ most significant implications for theory and practice.

6.1. Implications for theory

First, the present findings challenge the view of the project-based organization (PBO) as a rational, vertically aligned system of project deliveries. While much of the previous literature emphasizes top-down mechanisms and intentionality behind the arrangements of the project-based organizations (Hobday, 2000; Loufrani-Fedida and Saglietto, 2016), the findings suggest that lateral processes and wider institutional norms have a strong effect on the dynamics of the PBO. This means that while the findings confirm the importance of the institutional context for projects (cf. Lindkvist, 2004; Morris and Gerald, 2011), they go beyond that by questioning the extent to which it could be proactively managed. Consequently, future research should recognize and further investigate the role of these institutional processes as determinants of the PBO’s management structures and approaches along with their implications for organizational performance.

Second, while past research has introduced the view of the PBO as a loosely-coupled system (Bergman et al., 2013) by building on the notion of project as a temporary organization (Lundin and Söderholm, 1995), the present findings indicate the significance of lateral couplings among projects and individuals. Thus, while studies building on the notion of project as a temporary organization typically emphasize project boundaries (Scarborough et al., 2004) and decoupling (Bergman et al., 2013), the current findings show that
management models permeate these boundaries through mechanisms of imitation and informal sharing of information, experiences, as well as management techniques, via formal and informal competence networks. Consequently, there is a need to revisit the view of the PBO as a loosely-coupled system of autonomous temporary organizations. Instead, future research needs to investigate the antecedents, emergence and consequences of the lateral couplings within the PBO.

Third, the findings raise questions about the validity of some traditionally claimed advantages of the PBO as an organizational form. While extant literature praises the PBO form for its flexibility, innovation, and efficiency (cf. Brown and Eisenhardt, 1997), the identified isomorphic processes can hinder these characteristics. In addition, the identified mechanisms can offer alternative explanations for several empirical phenomena reported in the literature. For example, the “improvement paradox” (Brady and Maylor, 2010), that is, the situation in which obvious improvements are not implemented in a project setting, has been explained in terms of a complicity of actors involved in the project (ibid). However, the isomorphic mechanisms identified in this thesis suggest instead that this phenomenon can be due to intra-organizational institutional pressures from the parent organization and other projects. The same reasoning applies to the “renewal paradox” (Ekstedt et al., 1992), that is, the fact that project-based companies are often not innovative despite having excellent conditions for introducing innovative solutions when new projects are started from scratch. Similarly, while past research has noted that PBOs that operate many uncertain projects simultaneously are likely to end up in a less profitable zone of the “bureaucratization of chaos” (Geraldi, 2008), and has suggested the dictate of inflexible structures as the explanation of the phenomenon (ibid), the present findings suggest that these constraints appear as a combined effect of different isomorphic mechanisms rather than due to coercive forces alone. Consequently, this means that future research will need to include the intra-organizational institutional forces as a rival explanation of empirical phenomena.

Furthermore, while past research has pointed out that the literature often treats projects in PBOs as homogeneous units which are subject to top-down
standardized governance mechanisms (Ahola et al., 2014), the present findings suggest that heterogeneity of project-based operations and the characteristics of the social structure have important implications for the management of the PBO. In particular, these aspects are crucial for understanding the (lack of) effectiveness of homogeneous solutions (Bresnen et al., 2004) despite common attempts to standardize operations in PBOs (Ahola et al., 2014; Bergman et al., 2013). Consequently, the findings also call for a more nuanced understanding of the complex interplay between the heterogeneous operations and the structures and approaches which are used to manage them in the project-based organization.

In addition, the thesis calls attention to refining the concept of project context within the PBO by specifying the role played by other projects and PBO structures in relation to the focal project. While it has long been acknowledged that projects in PBOs affect each other by being a part of the organizational context (Engwall, 2003; Engwall and Jerbrant, 2003; Prencipe and Tell, 2001), the present findings provide a more detailed understanding of the inter-project processes by identifying the effects separate projects have on each other. These findings seem promising and call for further research inquiring into the characteristics of project landscapes, identifying their configurations and patterns of inter-project dynamics, as well as understanding their implications for the management of PBOs.

Finally, while past research mainly focuses on organizational-level variables to discuss PBOs (Söderlund and Tell, 2011), this thesis highlights the importance of individual-level variables as explanans of the PBO dynamics. In particular, the present findings suggest that informal social hierarchy is important for understanding intra-organizational dissemination of management structures and approaches. In addition, the findings illustrate the role of project actors as “institutional entrepreneurs” (Battilana et al., 2009), who exert their expert power to influence the institutions of the PBO. Thus, building on similar research trends in other streams of management, such as the “humanization of strategic management” (Pettigrew, 2012), and the microfoundations movement within organization theory (Felin, 2005; Felin et al., 2015), the thesis highlights the importance of a deeper understanding of the role of social landscape in shaping PBO’s management arrangements.
Consequently, more research needs to be done to understand the role of individuals and their actions in structuring projects within the PBO (cf. Hällgren and Lindahl, 2012, 2017), as well as their interactions with the arrangements at the PBO level.

6.2. Implications for practice

In terms of managerial implications, this thesis offers two kinds of contributions. First, the papers included in the thesis put forth a few frameworks and models that can be utilized to support managerial decisions in a PBO. In particular, Paper I develops a contingency model of program management competences (the 3C model) that can be useful for a range of HRM decisions, such as the appointment and promotion of program managers. In particular, managers can determine the type of program at hand and appoint a manager whose competences match the competence areas identified by the model. In addition, they can analyze the portfolio of programs in their organization and, depending on the prevalence of a particular program type, develop tailored training, development workshops and hiring and promotion criteria which will target the competence areas necessary for the program type. Consequently, the 3C model provides a refined HRM tool useful for managing a diverse set of programs.

Similarly, Paper II results in a framework that can help PBO managers evaluate the sources of isomorphic pressure on individual projects and programs by providing a list of ten isomorphic mechanisms within PBOs. This list can be used as a checklist in management discussions, where managers will subsequently reflect on the strength of each of the mechanisms in their organization and analyze its consequences. In addition, by connecting the mechanisms to specific organization design choices, the framework can assist managers in organizational redesign efforts. In particular, when a certain change is deemed necessary, the managers can use the framework to assess which specific isomorphic mechanisms can hinder the change and respond accordingly. For example, if the aim is to change project strategy, the managers need to make sure that coercive forces, such as formal frameworks and guidelines, as well as the expectations of steering group members, are aligned with the desired outcome.
In turn, Paper III and Paper IV put forth models and frameworks related to the organization design of the PBO. These models can be used as both checklists and the starting point of discussion in order to identify the organization design choices at hand. In addition, they can also be used to discuss whether there is a fit between various organization design dimensions in the PBO and, in the case of a misfit between certain dimensions, which changes need to take place to achieve a proper fit.

Second, the results also suggest more general implications for the management and organization of PBOs by drawing attention to the aspects and ideas that might otherwise be overlooked. In particular, Paper I supports the view that “one-size-fits-all” solutions for projects and programs is detrimental. Consequently, practitioners should carefully examine the content of their project-based operations when selecting management arrangements.

In addition, Paper II discusses how the identified isomorphic processes might limit such important PBO properties as flexibility, innovation, and efficiency. Practitioners can benefit from this idea in several ways. For example, they need to be vigilant about the fact that even though particular projects might require certain management approaches and arrangements due to their intrinsic character, their managers can copy practices from each other. As discussed above, in cases when the copied approaches will not fit the nature of the follower projects, this can result in lower efficiency. Additionally, for the projects that require a significant degree of innovation either in content or structures, it can be beneficial to use structural and spatial separation to insulate the projects from the intra-organizational institutional forces, as in the case of the “skunkworks projects” (Rich and Janos, 1994) or “tiger projects” (Clark & Wheelwright, 1992).

Furthermore, Paper III and Paper IV call attention to the fit between the project-level and PBO-level arrangements as well as between various organization design dimensions. Hence, PBO managers need to scrutinize the fit in organizational design choices across organizational levels, for instance, by investigating whether the project strategies are aligned with the organizational strategy.
Finally, the cover essay discusses the important factors that need to be scrutinized in order to assess organizing of the project-based operations, such as the technical content, the project landscape and social landscape, or the influence of institutionalized practices and models. One of the important implications of these findings is that PBO managers need to analyze the project and social landscapes when they want to introduce new management approaches and structures. The findings suggest that the most legitimate projects are the ones which are characterized by high scale/visibility and are perceived to be successful. Similarly, there are informal leaders among project and program managers who often serve as role models for others. The findings indicate that their high status is often manifested in perceived expertise, successfulness, and centrality in certain groups of managers. Consequently, PBO managers need to identify these “star” projects and “champion” project and program managers, and start introducing new management practices beginning with them, in order to ensure legitimacy and broad acceptance of the new approaches.
7. Conclusion

This thesis aimed to explore how project-based operations are shaped in the setting of the project-based organization. It started by highlighting a number of common yet questionable assumptions about projects in the literature on PBOs, and discussed the implications of these assumptions. Building on two research studies, that is, an insider case study of project-based operations in the Operations division of a large pharmaceutical company, and a structured framework-based literature review, the thesis investigated three particular dimensions which affect project-based operations: (1) the content of operations; (2) the context of operations; and (3) the social processes at the operational level. The present results elaborated on how the organizing of project-based operations in the PBO is shaped by the complex interplay between these three dimensions, and put forth novel concepts, such as intra-organizational isomorphic processes and project and social landscapes, which are helpful for understanding the PBO dynamics. Upon answering the research questions, the thesis discussed a number of specific implications of the findings for theory and practice.

7.1. Contribution

The contribution of this thesis lies in exploring the factors that shape project-based operations in the PBO context. Overall, the thesis can generally be viewed as an example of what Geraldi and Söderlund (2016) called a Type 2 of project studies, i.e. the type which recognizes projects as temporary organizations, acknowledges the diversity of projects, builds on general management and organization theories and aims to offer some implications for practice. Nevertheless, it also contributes to the identified important research directions of Type 3 research, which subscribes to an even more reflexive view on projects, namely by addressing the interplay between the technical core and social processes in project-based operations, as well as by going “beyond projects” in the investigation of a particular setting of the PBO.
More specifically, the thesis makes the following inter-related theoretical contributions. First, it extends the contingency perspective on management of project-based operations by investigating the relationship between program content and program management competences.

Second, it develops the institutional perspective on organizing project-based operations by identifying and explicating pertinent isomorphic processes and by contributing to the understanding of the intra-organizational institutional set-up. It discusses the powerful mechanism of imitation, and identifies factors that play an important role in this process, such as the personal proximity, reputation, and perception of prior results.

Third, it refines the concept of project context within the PBO by specifying the role played by other projects and PBO structures in relation to the focal project. The results contribute to a better understanding of the inter-project processes by singling out the effects of separate projects.

Fourth, it broadens the conceptualization of the PBO by analyzing the effects of individual- and project-level influences on the arrangement at the PBO level. The results show how project and program managers exert their expert power to institutionalize their management approaches as best practices, acting as institutional entrepreneurs.

Fifth, it revisits the view of projects as atomic homogeneous units within the PBO by recognizing their organizational properties. Drawing upon the rich literature of organization theory and design, the thesis makes a contribution to the literature by applying an organizational lens to projects in order to explain the internal dynamics of the PBO.

Finally, it develops an organization design perspective on the PBO. The contribution is achieved by integrating several streams within organization theory and design literature to propose an organization design model of the PBO, by identifying specific organization design dimensions and factors affecting the dimensions in the PBO context, by emphasizing a multi-level character of the PBO, as well as by proposing a future research agenda.
References


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