



Multi-project management in inter-organizational contexts

Miia Martinsuo^{*}, Tuomas Ahola

Department of Industrial Engineering and Management, Tampere University, Tampere, Finland

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ABSTRACT

Multi-project management is typically considered an intra-organizational endeavor of implementing strategies through programs, portfolios, or lineages of change and development projects. Inter-organizational multi-project management takes place between project-based firms and other actors in project networks. The multi-project aspects in inter-organizational contexts cause significant management complexity, but their specific requirements are inadequately understood. This article explores the nature and requirements of project-based firms' multi-project management in inter-organizational contexts. Parallel and sequential inter-organizational multi-project settings are proposed as an expansion to the dominant intra-organizational research. A thematic framework is developed based on stakeholder and agency theories and previous knowledge from portfolio and program management research complemented with an inductive analysis of extant literature. Consequently, we map and report previous research on multi-project management requirements relevant to inter-organizational contexts concerning strategy, resources, governance, and learning. Propositions are developed and future research is recommended in these domains.

1. Introduction

The increasing projectification implies an increasing share of project work in organizations, compared to non-project work (Henning & Wald, 2019). Projects tackle complex and large challenges in the society, requiring multiple projects and specialized expertise that is distributed across different organizations (Ika and Munro, 2022; Martinsuo et al., 2022). Project-based firms (PBFs) conduct projects as their primary business and combine also other organizations' technical expertise with their own capabilities in delivering unique solutions (Gann & Salter, 2000). At a given time, a PBF may be involved in several projects and address potential challenges concerning strategy, resource allocation, and prioritization among the projects (Ahola et al., 2014). In addition, such projects frequently depend on and build upon prior projects and build capability and relations that support future projects and services (Davies et al., 2006; Gann & Salter, 2000; Kujala et al., 2013). This paper is motivated by the need to understand multi-project management in an inter-organizational context.

PBFs actively work with different stakeholders. As a result, they are relationally and structurally embedded in project networks consisting of actors that may cooperate repeatedly (Burke & Morley, 2016; Jones et al., 2008; Manning, 2017). These project networks frequently involve both public and private organizations and both formal contractual and

informal non-contractual arrangements (Manning, 2017). For example, in the construction sector, it is quite possible that the same PBF is involved in multiple simultaneous projects with the same or different partners as part of a broader urban development program (Hedborg et al., 2020). Delivery of industrial equipment and systems, in turn, may enable future customer cooperation in the form of maintenance services (Kujala et al., 2013). Similar kinds of repeated project network organizations exist in film production, cultural industries, complex products and systems, and international development (Manning, 2017), but such networks may also operate without a focal PBF. Repeated involvement with the same or different stakeholders builds future capabilities: PBFs that rely on inter-organizational cooperation create and accumulate their capabilities through projects taking place over time (Denicol & Davies, 2022; Hobday, 2000; Manning, 2017; Whitley, 2006). While previous research portrays such inter-organizational multi-project contexts as important and also challenging (Burke & Morley, 2016; Manning, 2017), their requirements to managing the PBF remain scattered and unconsolidated.

From the perspective of a PBF, it is not sufficient that individual projects are managed efficiently. Projects need to be created, resourced, governed, and controlled in line with the firm's strategy and business goals. Multi-project management has thus far mainly dealt with intra-organizational change and development projects (Martinsuo, 2013;

^{*} Corresponding author.

E-mail address: miia.martinsuo@tuni.fi (M. Martinsuo).

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Martinsuo & Galdi, 2020), particularly in terms of portfolio, program, and lineage management (Martinsuo et al., 2019a, 2020). However, in inter-organizational settings, PBFs' stakeholders have different interests in projects, and each project involves a unique combination of stakeholders (Derakhshan et al., 2019; Martinsuo & Galdi, 2020). Furthermore, the agency relationships between PBFs and their stakeholders evolve over the course of each project (Ahola et al., 2021). Thus, the management of this multi-stakeholder multi-project environment differs from intra-organizational management, can be very dynamic and challenging, and requires dedicated research.

The inter-organizational context means that project-related decisions concern not only the PBF but several stakeholders involved in the projects as well as different agency relationships between the PBF and its stakeholders. When a PBF undertakes multiple projects together with its stakeholders, the design, choice, resourcing, and control of these projects are influenced by such organizations' strategies, values, and governance approaches (Ahola et al., 2008; Derakhshan et al., 2019; Laursen & Svejvig, 2016; Vuorinen & Martinsuo, 2019). Furthermore, the project networks established for the projects have different organizational constellations and may face different institutional norms, regulations, and temporal patterns (Dille et al., 2018; Söderlund & Sydow, 2019; Sydow & Staber, 2002), and their projects may start and end at different times depending on each project's specific project network and context. In this paper, we adopt stakeholder and agency theoretical views to PBFs' multi-project management in inter-organizational settings.

This article explores PBFs' multi-project management in inter-organizational contexts, focusing both on projects carried out *in parallel* (i.e., multiple simultaneous projects) and projects carried out *in sequence* (i.e., multiple projects carried out one after another). The goal is to increase knowledge of multi-project management and to guide the forthcoming research toward an extension from intra-organizational change and development projects to PBFs' projects in inter-organizational contexts. The focus is on the following research question: *How do project-based firms manage projects in parallel and in sequence in inter-organizational contexts?* As this article is conceptual and intends to open up new research avenues, new empirical research is not reported. Emphasis is placed on exploring the possibilities that adopting an inter-organizational perspective could offer for the future research on multi-project management. The chosen theoretical framing implies a focus on the PBFs' immediate relationships in their project networks, and peripheral and passive stakeholder relationships more broadly in the institutional field are purposely excluded, albeit acknowledged as a prospective additional research avenue.

We first introduce the inter-organizational context of PBFs and related theoretical foundations, to identify key considerations for multi-project management. The parallel and sequential multi-project settings of PBFs are introduced, and the literature discussing multi-project management in intra-organizational contexts is summarized, for purposes of insight and learning. Then we introduce the conceptual approach used for mapping the previous empirical research concerning multi-project management in inter-organizational contexts when PBFs take up multiple projects in parallel and sequentially over time. We then discuss the complex nature and unique requirements of inter-organizational multi-project management in terms of strategy, resources, governance, and learning, motivated through stakeholder and agency theoretical perspectives of inter-organizational contexts and based on themes relevant to intra-organizational multi-project management. Consequently, we derive propositions on these themes on PBFs' inter-organizational multi-project management and point out new research gaps, to promote forthcoming research on the focal phenomenon. Finally, the key contributions to multi-project management and stakeholder and agency theoretical considerations of PBFs' inter-organizational contexts are summarized.

2. Background

2.1. Project-based firms in their inter-organizational contexts

Project-based firms conduct projects as their business in interaction with other organizations that possess complementary resources and capabilities. Their projects, thereby, take place in inter-organizational contexts where the constellation of organizations is likely to vary from a project to another (Skaates et al., 2002) and the preparation and contracts for future projects is characterized by significant uncertainty (Cova & Salle, 2005). Despite the discontinuities inherent in project business (Hadjikhani, 1996), it is common that PBFs re-use trusted partners across several projects (Ahola et al., 2013; Eccles, 1981) and work for multiple customers in multiple projects simultaneously (Hedborg et al., 2020).

The inter-organizational relations of PBFs, particularly in connection with multiple projects, are often explained or analyzed through stakeholder or agency theory (Ahola et al., 2014, 2021; Biesenthal & Wilden, 2014; Derakhshan et al., 2019; Martinsuo & Galdi, 2020). Stakeholder theory and its applications in project studies draw attention to the PBF (or some other focal firm) and its stakeholders in a project network (Aaltonen et al., 2008; Lehtinen & Aaltonen, 2020). The PBF needs to understand stakeholder needs, respond to and manage them, and stakeholders may voice their expectations and experiences to influence the PBF and the project (Aaltonen et al., 2008; Witz et al., 2021). When multiple stakeholders are involved in projects, the project's **strategy** (including the position, direction, and success criteria for the project) may be significantly influenced by the involved stakeholders, not just the PBF (Arto et al., 2008a, 2008b; Patanakul & Shenhar, 2012). Arto et al. (2008a, 2008b) suggest that the dependence of a project from multiple stakeholders' interests will require interaction and agreement among the stakeholders, to come up with a shared project strategy.

Aaltonen et al. (2008), building on Frooman's work, tie stakeholder theory with resource dependence, when studying the power relations between the PBF and other stakeholders. They describe how stakeholders manipulate resources (e.g., build, withhold) to shape their power position in the project network. This idea of **resources** and their mobilization is not merely an issue of a single project, but it relates to the PBF's capacity to handle multiple projects and attempt to build project-related capabilities over time (Davies & Brady, 2016; Denicol & Davies, 2022; Gann & Salter, 2000; Hobday, 2000). Davies & Brady (2016) explicitly refer to portfolio management as a possible means through which PBFs balance and sequence their projects and build dynamic capabilities through the access, coordination, combination, and repeated use of resources.

Agency theory draws attention to the relationships of the PBF and the suppliers working on its behalf (and similarly the customer and the PBF as its supplier), and as such it relates to project **governance**. While some authors view agency theory as central to governance at the individual project level (Biesenthal & Wilden, 2014; Derakhshan et al., 2019), the external view to project governance (i.e., governance of projects) directs attention to how the PBF manages its projects in their inter-organizational contexts and the agency between PBF and its several projects (Ahola et al., 2014). Ahola et al. (2014) also explicitly mention project portfolios in connection with the governance of PBFs' projects. Ahola et al. (2021) point out the reality of PBFs' multiple simultaneous agency relationships and the plurality of goals (also strategies) among the PBF, its customers, and agents. Their analysis and framework reveal that the PBF's different agency relationships each require specific governance, stemming from the extent of their goal alignment, information asymmetry, risk sharing, and mechanisms of monitoring and control. Their review also suggests that the objectives of PBFs and agents may be completely different in the different project phases, thereby contributing to increased relational complexity (Ahola et al., 2021).

The above analysis suggests that when PBFs operate in inter-

organizational contexts, there is a need to consider the PBF's inter-project relationships and relationships with other stakeholders in terms of strategy, resources, and governance approaches, as summarized in Fig. 1. We use this theoretically grounded framework to guide our analysis.

2.2. Projects in parallel and in sequence in inter-organizational contexts

Project-based firms plan and carry out various projects **in parallel** (Brady, 2011; Gann & Salter, 2000). Technology suppliers in the engineer-to-order business offer complex products and systems such as vessels and manufacturing and process technologies and equipment, all equipment may be tailored to customer-specific needs in projects, and multiple projects may take place in parallel for multiple customers (Caron & Fiore, 1995; Mello et al., 2015; Yang, 2013). Software firms deliver information technologies and systems in parallel for different customers. Construction and architecture firms are involved in sales, design, and delivery projects or in urban development projects for different clients and as part of different project networks, often multiple projects at the same time (Bos-de Vos et al., 2019; Braun & Sydow, 2019; Hedborg et al., 2020; Hobday, 2000) and seek collaboration not only at the project level but also at the business and project ecology levels (Hedborg et al., 2020; Manning, 2017; Sariola, 2018). Public-sector organizations have investment project portfolios where they decide on and manage multiple simultaneous investment projects sometimes competing with each other but also benefiting from their simultaneity (Blismas et al., 2004; Brady, 2011; Martinsuo et al., 2019b; Vuorinen & Martinsuo, 2019). Furthermore, to achieve and grow their business, PBFs typically engage in multiple parallel sales projects, each possibly involving a unique project network (Tikkanen et al., 2007).

Project-based firms carry out diverse types of projects that have interdependencies with their past and future projects and thereby take place **in sequence**. Extension projects extend the functionality or capacity of the existing equipment or infrastructure. In these cases, the existing customer solution is not significantly altered and may even be operational during the installation of the extension (Chan et al., 2008). In extension projects, to ensure compatibility between the “new” and the “old,” the management of the interfaces between the extension project and the existing customer solution is vital. In urban development projects, not all functionalities are implemented at once, but projects may occur sequentially over a long period of time (Hedborg et al., 2020). For example, several projects may be implemented to gradually improve the transportation infrastructure in a specific city district. In addition, Bengtson et al. (2018) discuss how a construction company built three highly similar projects for a retail chain in geographically close locations. In rebuild and modernization projects, the customer solution is first either partially or completely disassembled by the supplier. The core components are then either refurbished or replaced (possibly with improved technology), and the solution is reassembled by the supplier (Mutka & Aaltonen, 2013). Delivery projects may also include additional project options. For example, in the shipbuilding industry, a client purchasing a cruise vessel may select the option of purchasing additional same-type (i.e., same-generation) vessels if it is satisfied with the performance of its first purchased vessel (Jha, 2016).

Increasingly, programs and their management are also discussed in



Fig. 1. Key themes to be covered in project-based firms' multi-project management.

inter-organizational settings, **combining parallel and sequential projects**. Inter-organizational programs deal with transformations that pursue and achieve significant effects not only in the participating organizations but also in the institutional field. They may involve multiple simultaneous projects, each with its own project network (Hedborg et al., 2020), and the program configuration may evolve over time (Mitrev et al., 2020), through new partners joining and projects beginning later. For example, infrastructure development and construction could be considered such a program (Frederiksen et al., 2021; Liu et al., 2019; Mitrev et al., 2020; Shen & Ying, 2022), and project ecologies may carry similar features as strategic programs (Hedborg et al., 2020). Large and complex projects more generally can be treated as programs and may well benefit from some aspects of program management (Eweje et al., 2012).

A certain PBF is not visibly apparent in the inter-organizational program research; rather, the attention is on the inter-organizational network arrangement concerning the involvement and collaboration of multiple stakeholders in a specific lifecycle phase or during the lifecycle of the program. For example, the focus is on how stakeholders together specify the expected value of the program at the early phase (Liu et al., 2019), how the program's organizational arrangements evolve over the lifecycle of the program (Mitrev et al., 2020), how the program operates with multiple parallel institutional logics and handles governance across organizational spaces (Frederiksen et al., 2021), and how the program fosters resilience to creeping disruptions through inter-project coordination throughout the program lifecycle (Shen & Ying, 2022). These studies clearly reveal the evolving nature of programs (as multi-project entities) over time, but the parallel and sequential arrangement and management of projects is covered in a limited way.

2.3. Learning from intra-organizational multi-project management of change and development

Multi-project management has been studied dominantly in terms of managing a project portfolio or program in the context of a single parent organization that conducts its change and development activities in the form of projects (Martinsuo & Galdi, 2020; Martinsuo & Hoverfält, 2018). We consider this as intra-organizational multi-project management. While such organizations may use external partners and stakeholders in their projects and programs (Martinsuo & Galdi, 2020; Vedel & Galdi, 2020), the projects are oriented toward the parent organization's change and development, not broader network-level or societal implications. Such research is not limited to PBFs but covers any types of organizations where projects may play any role. While program management also may be used for multi-project management, its research often treats the programs holistically (Martinsuo & Hoverfält, 2018) and rarely considers projects within the program in parallel or in sequence, except by following the logic of portfolio management.

Project portfolios and programs are managed by a certain parent organization that defines the projects' implementation conditions and the benefits to be gained from the changes pursued through the projects (Lehtonen & Martinsuo, 2009). In change and development projects and programs, a central task is to ensure the implementation of the desired change, which requires integration with and support from the parent organization (Johansson et al., 2007; Lehtonen & Martinsuo, 2009; Turkulainen et al., 2015; Vuorinen & Martinsuo, 2018). As multiple projects may compete for resources or share them, project-to-project and project-to-parent integration becomes important (Turkulainen et al., 2015; Vuorinen & Martinsuo, 2018), and the interdependencies between the projects need to be considered. Although autonomy and isolation from the parent organization are needed to guarantee suitable working conditions for implementing the desired changes (Lehtonen & Martinsuo, 2009), the needed resources and support from the parent organization may cause competition between multiple projects (Elonen & Artto, 2003; Engwall & Jerbrant, 2003). Besides concurrent

interdependencies, multi-project management research is increasingly concerned with the project lineage and sequence, that is, the order in which projects emerge through learnings from the past and create new opportunities for the future (Berggren, 2019; Kock & Gemünden, 2019; Midler, 2013).

In intra-organizational multi-project management, the multi-project entity (portfolio, program, lineage) is expected to implement the parent organization’s **strategy** (Archer & Ghasemzadeh, 1999a; Cooper et al., 1997b) and possibly a related project roadmap (Kock & Gemünden, 2019). This strategy is often quite explicit and directly guides the selection and creation of new projects (Cooper et al., 1997b). While the strategy might be known by the parent organization, the surrounding business environment is likely to evolve over time (Petit, 2012). Thus, the goals of the projects and programs tend to have an element of uncertainty; that is, they are not defined perfectly because the environment and the future are partly unknown. This is often reflected in decision-making processes that allow and even assume such uncertainty (Korhonen et al., 2014; Martinsuo et al., 2014; Petit, 2012; Petit & Hobbs, 2010) and create new emerging strategy patterns for the future (Kopmann et al., 2017).

When multiple projects are viewed as a project portfolio of the parent organization, the **resources** are typically owned and managed by the same organization. There have been studies that pointed out challenges with cross-unit resourcing within an organization (Abrantes & Figueiredo, 2015; Engwall & Jerbrant, 2003). The single parent organization’s ownership of the resources of the project portfolios and programs implies internal resource competition and bottlenecks because there are typically more project ideas than what can be realized with the existing resources (Elonen & Arto, 2003; Engwall & Jerbrant, 2003). The resource competition is often resolved through the use of portfolio selection and prioritization procedures and criteria to allocate resources only to the most promising projects (Archer & Ghasemzadeh, 1999b; Cooper et al., 1997b).

The **governance** for managing multiple projects is fairly straightforward to arrange in the context of a single organization. The early studies on project portfolio management dealt particularly with the techniques, mechanisms, and processes for managing the multi-project entity within a firm (Archer & Ghasemzadeh, 1999a, 1999b; Cooper et al., 1997a, 1997b; Teller et al., 2012). Later, the attention shifted to project management offices and their roles in governing the organizational approach to projects (Aubry et al., 2007), various aspects of decision making and control (Kock & Gemünden, 2016; Kopmann et al., 2017; McNally et al., 2013; Müller et al., 2008), and routines and practices (Bredillet et al., 2018; Clegg et al., 2018; Martinsuo, 2013; Vuorinen & Martinsuo, 2018). Governance is considered a multi-level issue, linking the projects with the parent organization (Biesenthal & Wilden, 2014). It is well understood that there is a contingency view to managing multi-project entities; that is, specific practices are needed for a specific context (Martinsuo & Geraldi, 2020). Where governance has often been considered an intra-organizational issue, its connection to the external stakeholders is also understood and is considered an important area for future research (Biesenthal & Wilden, 2014; Derakhshan et al., 2019).

The interest in the context and external connections of portfolios and programs is increasing (Martinsuo, 2013; Martinsuo & Geraldi, 2020; Pellegrinelli, 2002), and some inter-organizational issues are considered part of the intra-organizational multi-project management research. For example, environmental turbulence and contingencies are typically covered as control and moderator variables in portfolio studies (Kock & Gemünden, 2016; Kopmann et al., 2017; Müller et al., 2008; Voss & Kock, 2013). Programs are perceived as vehicles for shaping the context (Pellegrinelli, 2002), context influences programs (Laine et al., 2016; Pellegrinelli et al., 2007), and program managers are expected to be sensitive to what happens in the context (Miterev et al., 2015). External partners have been observed to influence the direction and development of a firm’s project portfolio (Vedel & Geraldi, 2020). Moreover, risk

management, which potentially covers risks originating from outside the organization, has been studied as an antecedent of project portfolio management success (Teller & Kock, 2013; Teller et al., 2014). Customer relationships (Voss, 2012; Voss & Kock, 2013) and supplier involvement are rarely covered specifically as part of project portfolio management. The current understanding, based on such studies, is that these external relationships are important for success in intra-organizational multi-project management and also create increased complexity.

The need for considering contextual connections and involvement of multiple stakeholders has been emphasized both in research on portfolio management (Martinsuo, 2013; Martinsuo & Geraldi, 2020) and program management (Martinsuo & Hoverfält, 2018). Following Arto et al. (2008a, 2008b) and Martinsuo and Geraldi (2020), we anticipate that when the PBF’s number of stakeholders increases in an inter-organizational context, the complexity likewise increases and creates new kinds of requirements for multi-project management.

2.4. Summary

Based on the preceding discussion, PBFs that collaborate with multiple stakeholders in project networks face unique circumstances concerning multi-project management, which requires dedicated attention. Research needs to pay attention to the complexities, uncertainties, and management approaches of multiple projects in parallel and in sequence in PBFs’ inter-organizational contexts, where multiple stakeholders are involved. Fig. 2 summarizes the different types of projects by organizational context and parallel versus sequential nature. The lower part of the figure represents the intra-organizational domain in which multi-project management has received plenty of previous attention. The upper part of the figure brings in PBFs in their inter-organizational contexts as potential arenas of multi-project management research. We will next explain how we mapped and consolidated extant knowledge on this issue.

3. Method

3.1. Conceptual study and approach to literature search

Among the alternative types of conceptual studies, we used theory adaptation as our approach (Jaakkola, 2020). Adaptation is sought by, first, adopting a stakeholder and agency theoretical view of PBFs in their inter-organizational context. With that choice, we extend the knowledge concerning intra-organizational multi-project management (i.e., project portfolio, program, and project lineage management) to the application domain of PBFs’ inter-organizational multi-project management (i.e., managing projects in parallel and in sequence), by bringing in knowledge from PBFs’ inter-organizational contexts.

We carried out three different searches to identify relevant previous empirical studies that dealt with multi-project management in inter-

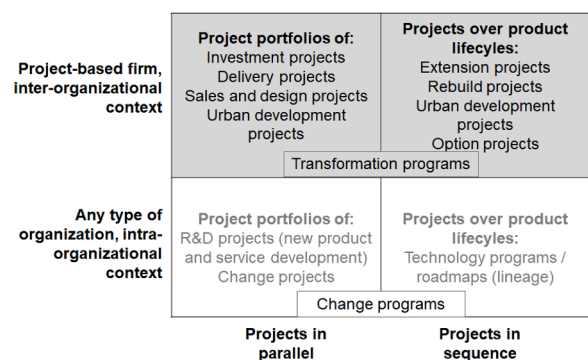


Fig. 2. Expanding the view of multi-project management toward inter-organizational contexts.

organizational contexts. This was because we were aware of the terminological challenges concerning the phenomenon: portfolios are rarely discussed in inter-organizational settings and multi-project phenomena are treated using very different terminology and concepts. First, we selected a few seminal and more recent articles dealing with project ecologies (e.g., Hedborg et al., 2020; Sydow & Staber, 2002) and inter-project cooperation (e.g., Dietrich, 2006; Prencipe & Tell, 2001; Wiewiora et al., 2014) and explored them and their reference lists and followers to identify relevant readings that center on PBFs in their inter-organizational context. Second, we used simple keywords such as “multi-project”, “portfolio”, “program”, together with “inter-organizational” or “network” in project-related journals (*International Journal of Project Management*, *Project Management Journal*, *International Journal of Managing Projects in Business*, *Construction Management and Economics*) to identify additional articles. Third, we conducted a snowball search for other articles and journals on the basis of the reference lists of the identified key articles and peer recommendations to find additional readings and to discard unsuitable articles.

3.2. Article screening and analysis

During the screening of the articles, we selected those that dealt with multiple projects in PBFs and in inter-organizational settings. We specifically identified events that included some kind of multi-project situation and management as part of empirical research, but we also included such conceptual studies and literature reviews that had taken place at the intersection of inter-organizational projects and multi-project management. As a consequence of this screening, we identified 48 articles with relevant contents and included these in our analysis. Appendix 1 includes the list of articles and their positioning with regards to the analysis.

The articles used in the Findings section were read through and initially divided into those dealing with managing projects in parallel and those covering the sequence (temporal order) of projects (some articles dealt with both). We first mapped the kinds of multi-project situations that represented PBFs' inter-organizational projects in parallel and in sequence (summarized in the previous chapter as a background for the analysis, see also Appendix 1). We then used the three main topics of the thematic framework shown in Fig. 1 to identify events concerning the multiple organizations' **strategies**, **resources**, and **governance**. Each of these main categories appeared in the reviewed empirical studies in different ways, and subcategories were developed, where needed.

The subcategories emerged by identifying similarities and differences between the articles and also by considering the content in light of themes from stakeholder and agency theories. For example, in parallel projects governance was coded into four subcategories that represent the governance systems in inter-organizational settings (multiple governance and control mechanisms, contracts governing information exchange) and ways of handling governance (different temporal rhythms, inter-organizational risk mitigation). These subcategories reflect ordinary agency-theoretical considerations in inter-organizational contexts. For sequential projects, resources were coded into four subcategories that reflect the repetition and outcomes of a PBF's external resource use (standardization and efficiency, specialization and innovation), and strength of the inter-organizational relationship (strengthening relational ties, resource lock-ins and risks). These subcategories have clear connections with stakeholder-theoretical themes. Tables 1 and 2 reveal the sub-categories identified in this way, including more detailed examples from the screened articles.

During our analysis of the articles, **learning** emerged as an additional main category particularly in sequential multi-project settings, so we added it to the analysis framework. It deals with the use, accumulation, and transfer of knowledge in the PBF and/or its stakeholders and represents some kind of a change for some of the involved organizations, potentially also concerning some other dimensions of the framework

Table 1

Summary of findings on parallel multi-project management in inter-organizational contexts.

Category	Key themes for projects in parallel	Examples of previous findings
Strategy	Multiple strategies; stakeholders with different value priorities	<ul style="list-style-type: none"> In publicly funded large projects, stakeholders have competing interests in multiple parallel projects that require prioritization and negotiation between the PBF and stakeholders (Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019).
Resources	Synergies	<ul style="list-style-type: none"> PBFs may achieve financial or managerial benefits from using the same contractors repeatedly (Griffith, 2007, 2011). PBFs may use cross-staffing between multiple projects (Hetemi et al., 2022). Multiple urban investment projects decided in the same committee may benefit from synergies (Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019).
	Resource competition and required inter-organizational coordination	<ul style="list-style-type: none"> Multiple urban investment projects decided in the same committee may suffer from resource competition and have interdependencies (Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019). PBFs may face a coordination requirement in multiple projects' interdependent supply chains (Ekeskär et al., 2022; Mello et al., 2015) Cooperative horizontal relationships (i.e., cooperation between competitors) of contractors used in multi-project urban development districts; third-party logistics providers coordinating them (Ekeskär et al., 2022).
Governance	Multiple governance and control mechanisms	<ul style="list-style-type: none"> Project actors have different control and governance mechanisms (Martinsuo & Ahola, 2010; Kujala et al., 2021; Lehtinen & Aaltonen, 2020). Actors may develop shared inter-project routines to manage the clients' interdependent requirements (Hedborg et al., 2020). Actors may share a common project directory and documents (Hetemi et al., 2022; Iftikhar & Ahola, 2022).
	Contracts governing information exchange	<ul style="list-style-type: none"> Contractual arrangements and coordination roles may promote or inhibit information exchange among actors and between projects (Ekeskär et al., 2022).
	Different temporal rhythms	<ul style="list-style-type: none"> Different temporal rhythms and interdependencies between project actors require their alignment and possible problem solving (Dille et al., 2018; Söderlund & Sydow, 2019; Sjørne et al., 2019).
	Inter-organizational risk mitigation	<ul style="list-style-type: none"> Mitigation or sharing of risks and compensating for a financial loss across projects in architectural firms (Bos-de Vos et al., 2019)

(continued on next page)

Table 1 (continued)

Category	Key themes for projects in parallel	Examples of previous findings
Learning	Knowledge and technology sharing across projects (among the stakeholders)	<p>and a transport firm (Olsson, 2008).</p> <ul style="list-style-type: none"> Projects enable innovations and may interact with each other for technology and knowledge transfer during their implementation (Brady, 2011; Davies et al., 2006, 2016; Gann & Salter, 2000; Hobday, 2000). Unsystematic learning from projects (Chronéer & Backlund, 2015).

(strategy, resources, governance). It appeared both in articles concerning parallel and sequential multi-project management and is to some extent featured in previous resource-based or dynamic capability-based views on project portfolios (Killen et al., 2012) and PBFs (Davies et al., 2016; Denicol & Davies, 2022). Here, we will specifically consider inter-organizational aspects of learning in connection with stakeholder and agency theories.

We use this thematic structure in this article to report findings about the PBFs' management of multiple projects in parallel and in sequence in an inter-organizational context. We then discuss the nature and requirements of inter-organizational multi-project management to respond to the research question and identify future-research possibilities.

4. Findings

4.1. Managing multiple inter-organizational projects in parallel

Our analysis reveals that previous literature dominantly discusses PBFs' parallel multi-project management from the perspectives of governance and resources, whereas strategy and learning and considered less. The competition and requirements of coordination between the involved organizations draw attention to their network positions and power and expose the PBFs to various demands and uncertainties.

Table 1 summarizes the previous empirical studies that covered PBFs' inter-organizational projects occurring in parallel, and categorization into the main themes of strategy, resources, governance, and learning. Managing multiple projects in parallel is PBFs' primary way of carrying out their core business and implementing their **strategy**. However, with multiple organizations involved, the different organizations may use different strategies and may require negotiation among themselves to align their strategies and expectations both at the front end of the project and during the project implementation (Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019).

For construction PBFs and related public-sector investors, having parallel projects may be an excellent way of optimizing **resource** use, trying out alternative solutions, and achieving synergies (Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019). The use of preferred contractors may be beneficial particularly in the small building-works portfolio of public-sector clients (Griffith, 2007, 2011). The PBF may benefit from cross-staffing parallel projects and documenting expertise in a directory, to enable projects' access to the right competences (Hetemi et al., 2022). Projects may compete for resources and may need to coordinate interdependent supply chains (Ekeskär et al., 2022; Mello et al., 2015), or parallel projects may depend on each other's resources, posing a prioritization challenge for the PBF (Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019).

When multiple organizations are involved in parallel projects, they need to negotiate with each other and agree on how **governance** will be handled in the different projects. There are indications that the project actors may have different control and governance mechanisms that need

to be agreed upon within and across projects (Martinsuo & Ahola, 2010; Kujala et al., 2021; Lehtinen & Aaltonen, 2020). Firms may, however, share the same project directories and documents (Hetemi et al., 2022; Iftikhar & Ahola, 2022) and develop shared inter-project routines to manage the interdependencies stemming from their clients' requirements (Hedborg et al., 2020). Contractual arrangements and coordination roles may promote or inhibit information exchange among the actors and between the projects (Ekeskär et al., 2022). Having parallel projects may enable risk mitigation or sharing and obtaining compensation for a financial loss in one project, as was discovered in architectural firms (Bos-de Vos et al., 2019) and a transport firm (Olsson, 2008). Some studies point out the different temporal rhythms and interdependencies between the project actors (Dille et al., 2018; Söderlund & Sydow, 2019; Stjerne et al., 2019), requiring their alignment and perhaps problem solving. All these issues expose the PBFs to various demands and uncertainties in coordinating the project network and using its network position and power appropriately. The conceptual studies of Biesenthal and Wilden (2014) and Derakhshan et al. (2019) invite further research on governance arrangements concerning project business in inter-organizational settings and concerning project portfolios.

Knowledge sharing and **learning** may occur between simultaneous projects, particularly if the projects enable innovations and interact with each other for technology and knowledge transfer during their implementation (Brady, 2011; Davies et al., 2006, 2016; Gann & Salter, 2000; Hobday, 2000). The approaches to resourcing and governance-related directories and documentation may be considered as important vehicles for such inter-project knowledge work (Hetemi et al., 2022). Inter-project learning in PBFs, however, may remain highly unsystematic, as reported by Chronéer and Backlund (2015) in engineering and construction firms.

The literature review herein reveals that PBFs engage in multi-project management in their inter-organizational context, but the multi-project settings tend to be examined very vaguely, as contextual conditions surrounding the possible co-occurrence of simultaneous projects. The simultaneity of projects is covered in terms of coordination and prioritization challenges and possibilities for synergies and learning, but it tends to be treated only corollary to some other topics instead of as the main topic of the studies. Certain PBFs or clients are portrayed as powerful hosts that might benefit or suffer from such complex conditions. Yet, the attention is often at the interplay between the PBF with the other actors in the project network. The management of parallel projects in inter-organizational contexts appears as an ungoverned playground or battlefield of multiple PBFs and clients, each with its own strategies, resources, governance systems, and potentially limited readiness to learn.

4.2. Managing multiple inter-organizational projects in sequence

Previous literature has covered PBFs' sequential multi-project management richly and in versatile ways, particularly in terms of resources and learning, but also concerning strategy and governance. The aspiration for future projects and strategy renewal encourage PBFs toward strengthening their stakeholder relationships, replicating network structures, and exploiting and reusing capabilities, but at the same time may cause novel risks and conflicts between projects and stakeholders.

Table 2 summarizes examples of empirical studies that covered PBFs' management of sequential projects in inter-organizational contexts, divided according to the main themes of strategy, resources, governance, and learning. Earlier studies have highlighted the fact that PBFs use sequential projects strategically for exploring new business opportunities and exploiting their core competences (Artto & Turkulainen, 2018; Brady & Davies, 2004; Laurila & Ahola, 2021). In addition to implementing **strategy**, sequential projects, particularly modernization projects, may provide inputs for a firm's strategic renewal (learning through projects; Mutka & Aaltonen, 2013). Sequential projects are also

Table 2
Summary of findings on sequential multi-project management in inter-organizational contexts.

Category	Key themes for projects in sequence	Examples of previous findings
Strategy	Links to strategies of multiple firms	<ul style="list-style-type: none"> Sequential projects are used as vehicles to support the implementation of the parent firms' (Frederiksen & Davies, 2008) or customer firms' (Kujala et al., 2013) strategy.
	Projects renewing strategy and institutions	<ul style="list-style-type: none"> Sequential projects, particularly modernization projects, may provide inputs for a firm's strategic renewal (learning through projects; Mutka & Aaltonen, 2013). Inter-organizational multi-project networks as vehicles for broader societal economic growth (Gann & Salter, 2000) and institutional transformation. Firms use vanguard projects to create a novel demand market and to test out technological options before venturing into larger scale investments (Frederiksen & Davies, 2008). Project actors use complex legitimacy acquisition patterns to respond to industry shifts (Hetemi et al., 2021).
Resources	Standardization and efficiency	<ul style="list-style-type: none"> Sequential projects with similar inter-organizational project networks may promote efficiency of project operations (Eccles, 1981; Manning, 2005; Sydow & Staber, 2002). Sequential projects may provide opportunities for standardizing technological subsystems (Turkulainen et al., 2015).
	Specialization and innovation	<ul style="list-style-type: none"> Sequential projects with similar inter-organizational project networks may reduce the innovativeness of the project outcomes (Sorenson & Waguespack, 2006). Repeated use of the same suppliers may provide opportunities for innovating at a component or subassembly level (Ahola et al., 2008). Specific individuals may, over time, become very specialized in certain kinds of recurring projects. Small and specialized pools of suppliers engage in repeated projects with a high degree of similarity (Manning, 2005). Over time, firms develop specialized integration mechanisms to manage interdependencies between sequential projects (Turkulainen et al., 2015).
	Strengthening relational ties	<ul style="list-style-type: none"> Sequential projects provide opportunities for developing relational ties to actors in the business environment (Bengtson et al., 2018). Relational history has implications on contractors' expectations of and satisfaction with the clients' control system use (Järvenpää et al., 2022). Carrying out sequential projects may reduce the risk of

Table 2 (continued)

Category	Key themes for projects in sequence	Examples of previous findings
Governance	Lock-ins, resource risks	<ul style="list-style-type: none"> discontinuities and sleeping relationships between projects (Hadjikhani, 1996). Project supplier's personnel working at customer site may provide opportunities for strengthening relational ties between the involved organizations (Kujala et al., 2013) Organizational and technological lock-ins may constrain the initiation of projects (Aaltonen et al., 2017). Resources and options may be undervalued by the parent firm. Lock-ins may also relate to the expectations of other firms' behaviors (Aaltonen et al., 2017). Dense networks (characterized by strong relationships between actors) face the risk of inertia, i.e. failure to learn (Sydow & Staber, 2002)
	Replicated structures and responsibilities	<ul style="list-style-type: none"> Specific resources (e.g., managers) are often assigned to projects similar to those carried out in the past (Arto & Turkulainen, 2018; Turkulainen et al., 2015). Project organizations may be transferred from one project to the next instead of rebuilding the organization from "scratch"; PBFs may pursue "strategies of replication" (Davies & Brady, 2016). The governance structures of sequential projects may differ considerably due, for instance, to the changes in the market situation or learning effects (Davies et al., 2009). Differing governance structures between explorative and exploitative projects (Brady & Davies, 2004)
Learning	Differentiated structures and responsibilities	<ul style="list-style-type: none"> Organizations may, over time, develop capabilities to carry out specific types of projects (Davies & Brady, 2016; Zerjav et al., 2018). Firms may develop practices for using inter-organizational projects for executing routine tasks (Bakker et al., 2011) Firms learn to use inter-organizational projects to mobilize key stakeholders (Liefstink et al., 2019) PBFs may benefit from capabilities built during projects when offering project-related services and establishing long-term relationships with their customers (Davies et al., 2006; Gann & Salter, 2000; Kujala et al., 2013). Reusing developed knowledge in subsequent projects; developing repeatable project delivery (Brady, 2011; Davies et al., 2006; Hetemi et al., 2020) Developing and deploying capabilities across multiple projects (Davies et al., 2016; Zerjav et al., 2018) Integrating knowledge from projects into continuous business operations (Gann & Salter, 2000)
	Specialization	
	Exploiting capabilities developed in projects for service business	
	Knowledge reuse and dynamic capabilities	

(continued on next page)

Table 2 (continued)

Category	Key themes for projects in sequence	Examples of previous findings
		<ul style="list-style-type: none"> Project actors purposefully re-use documents from previous related projects (Hetemi et al., 2022)

strategically important at the societal level as they have been said to act as vehicles for societal economic growth (Gann & Salter, 2000) and institutional transformation. Specifically, PBFs use projects as vehicles for testing the market potential of technological options (Frederiksen & Davies, 2008). In addition, projects have a role in establishing legitimacy required for responding to industry shifts (Hetemi et al., 2021).

Sequential projects share complex interdependencies that affect the use of **resources**. For example, PBFs may become locked into the design solutions and/or technologies that they chose in their preceding project (Aaltonen et al., 2017). Such design or technology lock-ins may force PBFs to integrate inferior and possibly less cost-efficient equipment in their offerings. In addition, PBFs may be locked into the organizations that participated in their past project if such organizations hold monopolies for the components that need to be integrated in the new offering (Narasimhan et al., 2009; Sydow & Staber, 2002). Path dependency, the tendency of actors to not make decisions that considerably deviate from their past decisions, may also set limits to project actors. Specifically, Aaltonen et al. (2017) discuss how a project for renovating an urban area was significantly hindered by the incremental development activities that had been carried out in the past.

Repeatedly utilizing the same resources across sequential projects may offer benefits such as efficiency (Manning, 2005), as well as drive the introduction of specialized integration mechanisms (Turkulainen et al., 2015). Additionally, PBFs frequently support their delivered solutions with maintenance and other services during operations, which add revenue, allow the firms to establish a strong presence at their customers' facilities, and enable them to develop closer relationships with their customers (Davies et al., 2006; Gann & Salter, 2000; Kujala et al., 2013). Partnerships with key subcontractors may be used to facilitate the development of the core technologies required in future deliveries. For example, in the context of the shipbuilding industry, Ahola et al. (2008) discuss how a shipyard collaborated with a supplier of cabin areas to support the development of such critical areas. The cabin area supplier invested considerably in the modularization of cabins so that they could be mass produced and so that their installation time onboard would be reduced. When the PBF has personnel working at the customer site through the course of repeated projects, the opportunities for developing relational ties are enhanced (Kujala et al., 2013). Arto and Turkulainen (2018) discuss how Neste, an international oil company, built a series of biodiesel production facilities over time. After piloting and commercially launching the technology in two smaller plants in Finland, it established large refineries in Singapore and Rotterdam. When building the large refineries, Neste relied on replication of the technological core components and reuse of the parts of the organization responsible for building the plants. A key finding here is that in addition to project designs, project **governance** structures may be reused in sequential projects.

Delivering multiple projects that are highly similar to each other often allow for inter-organizational **learning** and increased efficiency of operations. Capability development across sequential projects is broadly discussed in the delivery of complex products and systems (Brady, 2011; Davies et al., 2006, 2016; Gann & Salter, 2000). In complex products, design is a significant cost factor, and repeated deliveries of similar products may allow the reuse of designs and operational practices (Hetemi et al., 2022). Repeatedly carrying out projects for the same customer helps the PBF tackle the problem of discontinuities and sleeping relationships that characterize project business (Hadjikhani, 1996). For example, Kujala et al. (2013) discuss how an automation

supplier was gradually able to become a trusted partner of an oil company through its repeated deliveries of highly similar projects. This business relationship allowed the automation supplier to learn how to work efficiently with its client. Over the course of sequential projects, PBFs may also learn to utilize projects as vehicles for efficiently implementing tasks that are complex, yet routine in nature (Bakker et al., 2011). Repeated deliveries of highly similar projects may also allow PBFs to repeatedly utilize the same subcontractors and mobilize key stakeholders (Liefink et al., 2019). In the construction industry, systems integrator firms typically repeatedly utilize a limited number of strategically important subcontractors (Eccles, 1981). Also, in the context of television and film production, groups of individuals who have worked together in the past are frequently rehired to promote efficiency (Manning, 2005; Sydow & Staber, 2002).

Our analysis revealed that in PBFs' sequential multi-project settings, the previous research to some extent differentiates between clients and PBFs in terms of whose project sequence is discussed, but the issues appear similar in them, and multi-project entities are treated vaguely and even only implicitly. The previous studies revealed tensions and emphasized a need to find an optimal balance between efficiency through standardization, repeated ties, operations, and knowledge sharing on the one hand and innovation through capability specialization, novel ties, sensitivity to unique circumstances, and purposive knowledge acquisition on the other hand. The management of PBFs' sequential projects in inter-organizational contexts appears to consist of reactive attempts to resolve such tensions and of disjointed capability-building mechanisms of PBFs and clients.

5. Discussion

The previous chapters present many examples of how PBFs plan and implement multiple projects in parallel and sequentially in inter-organizational contexts. In the context of inter-organizational projects, PBFs, customers, and other stakeholders interact in networks to design, produce, and operate complex products and systems (Gann & Salter, 2000). As in intra-organizational project portfolios, project initiation and selection, managers' attention, and decision making in inter-organizational multi-project settings are also influenced by the other past and ongoing projects and the future plans. Our analysis showed that multi-project management in an inter-organizational context is vague, reactive to challenges and complexities, and rich with tensions stemming from the different requirements and expectations of the involved stakeholders.

Our research question inquired: *How do project-based firms manage projects in parallel and in sequence in inter-organizational contexts?* Next, we first discuss the key requirements PBFs face, when pursuing multi-project management in an inter-organizational context. As our analysis revealed PBFs' implicit treatment of parallel and sequential projects, we reflect the key observations on stakeholder and agency theory, to pinpoint the theory-driven missions that need to be resolved. Then we discuss the perspectives of strategy, resources, governance, and learning covered in the analysis, to derive propositions and guide further research. We also suggest several pathways for forthcoming research.

5.1. Requirements to project-based firm's multi-project management in inter-organizational contexts

The findings revealed examples where various multi-project issues emerged as part of inter-organizational contexts. The articles reviewed for this study showed that PBFs engage in multiple projects both simultaneously and one after another and involve their stakeholders in and across such projects. The projects may simultaneously be part of multiple organizations' portfolios or programs. While managing a multi-project entity was only vaguely and largely implicitly treated in the previous studies (with Hedborg et al., 2020 as an example exception), the reviewed examples showed that **the simultaneity and sequence of**

projects pose challenges to the PBFs' business in project networks, due to different stakeholders' positions and power, agency relationships, and different and parallel temporal orientations.

Our analysis built upon stakeholder theory and an assumption of PBFs as important focal firms that rely on inter-organizational cooperation and benefit from sharing and capability building across projects (Davies et al., 2006; Gann & Salter, 2000; Hobday, 2000; Whitley, 2006). The findings showed that PBFs' ways of managing multi-project entities are susceptible to the PBF's and its stakeholders' network positions and power in the inter-organizational context. When the projects are hosted not only by the PBF but involve other stakeholders, each actor can have different strategies, roles, and tasks in different project networks. The centrality of the PBF and the position of its stakeholders in the network are linked with the power that they have with regard to the projects (Ahola et al., 2020). The varying power positions across projects imply increasing complexity for PBF's multi-project management. As a rare example of research concerning this complexity, Aaltonen & Kujala (2016) explored the dimensions which can be used to differentiate between project contexts and influence approaches for managing stakeholders in different contexts. PBFs will need ways to balance and sequence their projects in a portfolio, while at the same time coordinating the complex context (Davies & Brady, 2016). The **necessity to acknowledge both PBF's and its stakeholders' position and power** differs clearly from the intra-organizational research on portfolios and programs and causes particular requirements for the PBF's multi-project management.

Agency theory encouraged paying attention to the relationship between the PBF as the principal and each of its stakeholders as an agent. The nature of the PBF's relationship with each stakeholder is colored by unique features: different goals, information needs, and monitoring and control specific to each relationship (Ahola et al., 2021). The findings showed that stakeholders differ in these issues from each other and the PBF, and the PBF will need mechanisms to handle diversity in its agency relationships, also in terms of multi-project management. Contracts specify the relationships between the organizations involved in projects and might be reflected in some project path dependencies but do not necessarily guide the multi-project aspects of management. Participating organizations may engage in co-opetition, that is, compete with each other in one project and collaborate with each other in another project under a different contract (Cassiman et al., 2009). **PBF's multi-project management in and between different agency relationships**, potentially each with their own contractual arrangements, creates completely new requirements compared to managing intra-organizational portfolios and programs. While the earlier research addressing agency relationships of PBFs has primarily concentrated on the management of individual agency relationships (Müller & Turner, 2005) in isolation from each other, our study highlights the need to identify and manage interdependencies between such relationships across multiple projects (in line with Ahola et al., 2021).

Both stakeholder theory and agency theory bring up the issue of goals and strategies as important in the PBF's stakeholder relationships, covering the future direction and performance criteria. Looking at parallel and sequential multi-project management together reveals an inherent uncertainty, evolving nature, and temporal orientation in multi-project management which somehow brings together a portfolio view (coordinating projects in parallel) and program view (allowing new projects and demands to emerge over time). Our analysis highlights the complexity of understanding and managing goal incongruence in multi-actor contexts over the short-term (parallel projects) and long-term (sequential projects). The short-term and long-term objectives of projects as well as their various participating stakeholders may – and frequently do – conflict with each other and evolve over time. **The PBF's necessity to manage the various agency relationships covering both short-term and long-term temporal orientations across multiple projects** brings together ingredients from portfolio and program management and, thereby, novel requirements. Vedel & Gerdaldi (2020)

have drawn attention to firms' contractual paths with stakeholders in project portfolio management and invited further research into such paths.

5.2. Ingredients of multi-project management in project-based firms' inter-organizational contexts

The above discussion suggests that, while PBFs may learn from ordinary intra-organizational multi-project management as summarized in the background of this paper, they also face particular challenges in involving their stakeholders in multiple parallel and sequential projects. The previous chapter suggests factors central in the nature of PBF's multi-project management in inter-organizational contexts. Fig. 3 summarizes the multi-project management issues identified through this review, adding content to the analysis framework used. Below, we discuss each of the issues separately and offer interpretations of the issues, in the form of propositions that could also guide forthcoming research.

In inter-organizational contexts, different organizations have different strategies and goals and different expectations of value (Ahola et al., 2008; Arto et al., 2008a, 2008b; Martinsuo et al., 2019; Vuorinen & Martinsuo, 2019). These different organizations' strategies may differ from and even dramatically conflict with each other due to competition over markets or resources. Yet, firms might need to collaborate with each other in certain projects due to the limited local resource markets, highlighting the need for co-opetition. The creation and roadmap of new projects are influenced by the multitude of firm-specific strategies within the industry and can, over time, bring about societal, economic, and institutional changes. Our findings indicate that PBFs will need to consider their strategy for multiple projects - i.e., multi-project strategy - based on an understanding of their stakeholders' strategies, in addition to their own strategy.

Proposition 1. *In an inter-organizational context, PBFs develop their multi-project strategy based on an understanding of their own and stakeholders' short-term and long-term strategies. Both short-term and long-term temporal orientations are beneficial in multi-project management in inter-organizational contexts: parallel projects can provide opportunities for balancing across strategic goals and priority areas, whereas sequential projects provide opportunities for strategic renewal.*

In a project network, the resources are not controlled by the PBF and can be accessed by multiple stakeholders, thus requiring procurement and contracts. The availability of resources may depend on the network position and relationships of the PBF (Partanen et al., 2018) and on the local labor markets and industry trends. Our analysis showed that the management of resources is challenging in many ways due to different organizations' needs and the conflicting requirements of temporality versus continuity. On the one hand, synergies, standardization, and repeated ties may drive resource efficiency, but on the other hand, cross-project resource use may also lead to resource competition, low innovativeness, risks and lock-ins, and high coordination requirements. In inter-organizational contexts, resources are owned and controlled by multiple organizations with different priorities, which is likely to cause the aforementioned tensions and conflicting requirements. In order to avoid risks and conflicts, the resource-related actions benefit from guidance through the PBF's multi-project strategy.

Proposition 2. *In an inter-organizational context, PBFs build and leverage resources together with their stakeholders over time. Multi-project strategy guides resource management in the inter-organizational context. Management of resources in the PBF's parallel projects is characterized by leveraging of synergies and avoidance of resource conflicts, whereas the management of resources in sequential projects is characterized by efficiency-seeking and specialization.*

In inter-organizational contexts, different organizations have their own governance structures and approaches. When collaborating in a

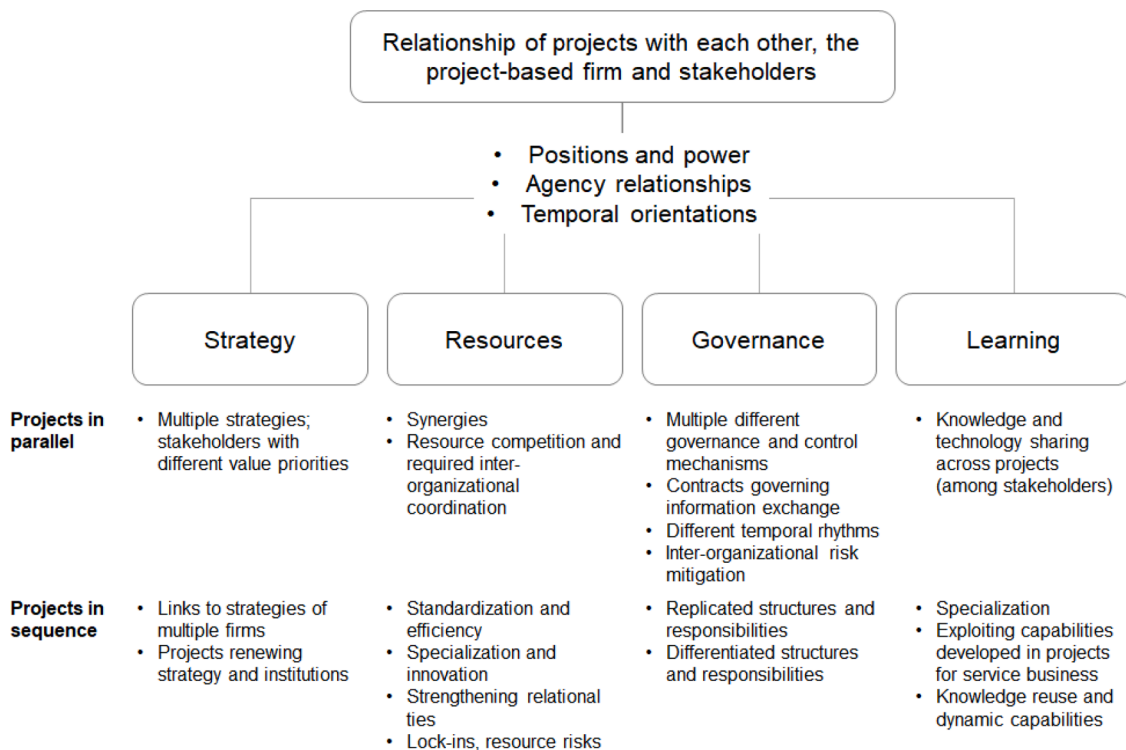


Fig. 3. Summary of multi-project management requirements to be taken into account in inter-organizational contexts.

network, PBFs need collaboration with stakeholders project-specifically to select the mutually suitable governance approach (Ahola et al., 2014), and the choice is also affected by their network position and power. The project delivery modes may vary; partnership contracts, alliances, and procurement approaches all have their specific requirements for the governance approach, sensitive also to the power position of each stakeholder in the project network. Our review showed that firms may replicate or differentiate governance approaches from one project to another depending on what seems more appropriate for the circumstances (e.g., on the basis of their previous knowledge on the other actors, risks, or contracts). In addition, the different temporal rhythms of the involved organizations may influence the selection of governance approaches for specific projects.

Proposition 3. *In an inter-organizational context, PBFs select their governance approach depending on network positions and power in their agency relationships. They may use different governance approaches for different projects and different agency relationships. Governance of PBF's parallel projects is characterized by control and coordination-oriented mechanisms (resembling project portfolio management), whereas governance of sequential projects is characterized by stakeholder role specifications and optimization of project network structures (resembling program management).*

Our exploration of multi-project management in inter-organizational contexts revealed that learning and capability development are central manifestations of project interplay (Davies et al., 2006, 2016; Denicol & Davies, 2022; Gann & Salter, 2000), especially when projects follow one another in sequence. Advancement and maturation of a PBF occurs through the projects that the firm implements over time, particularly if mechanisms are in place for reusing the knowledge obtained from old projects in new projects, transferring the obtained knowledge to life-cycle services, or becoming increasingly specialized in certain types of projects. Learning can also be used as a potential input for PBF's strategy renewal, and multi-project management can be considered as a mechanism for the PBF's survival and growth (Geraldini et al., 2022). However, this learning is emergent and responsive to uncertainties (instead of

planned and governed), both caused by stakeholders' willingness to share knowledge and events occurring in the environment.

Proposition 4. *In an inter-organizational context, PBFs use multi-project management for strategic survival and growth. This occurs through learning both in their relationships and over time across projects. PBFs' learning from parallel projects is primarily efficiency-seeking in nature (knowledge sharing), whereas learning from sequential projects is primarily effectiveness-seeking in nature (exploiting capabilities, specialization).*

5.3. Avenues for future research

The above propositions open up some pathways for developing and testing models on the key aspects of PBF's multi-project management. Further research is encouraged to characterize the parallel and sequential multi-project settings empirically and to map the unique features of different multi-project settings, including public, private, non-profit, and collaborative settings. Potentially the PBFs' and customers' perspectives could be considered separately or in parallel. Table 3 suggests some ideas to explore strategy, resources, governance, and learning in inter-organizational multi-project settings with more detail. Alignment of strategies, sharing of resources, selecting the modes of governance, and learning in sequential projects at the level of project networks involved in multiple projects are of particular interest. We also propose further research to explore the boundaries between different stakeholders' project portfolios and issues concerning how such boundaries are managed, particularly concerning decision making in parallel and sequential project settings.

This study did not delve deeper into the nature of the PBF's different stakeholders or the context more broadly. Stakeholders may include private and public organizations, as well as non-profit organizations, and their relationships with the PBF vary from weak to strong. There is a need to further investigate the stakeholders' unique network positions and power, and relational setting between public and private organizations, as well as politics involved when projects attempt to influence the institutional field. PBFs face the institutional regulations and norms

Table 3
Possible research topics concerning the dimensions of PBF's multi-project management in inter-organizational contexts.

Theme	Possible research topics
Strategy	<ul style="list-style-type: none"> • Strategic steering in inter-organizational multi-project settings. • Temporal orientation to multiple parallel project objectives covering projects in different lifecycle phases. • Political, regional, and institutional transformation initiatives and long-term programs driving multiple projects in PBFs. • Linkage between multi-project strategy and inter-organizational projects both for PBFs and customers. • Projects' contributing to the achievement of multi-project strategies after their completion. • Strategy changes and related changes of project success criteria.
Resources	<ul style="list-style-type: none"> • Consideration of resource priorities in inter-organizational contexts in multi-project settings prior to contracting. • Scheduling of stakeholder-specific resource use to enable efficient multi-project management. • Mobilization of contracted resources vs. volunteer resources in PBF's multi-project settings (e.g., international development).
Governance	<ul style="list-style-type: none"> • Navigating across the different governance approaches in personnel's daily work. • The evolving governance over time across projects in sequence. • Balancing between short-term (parallel projects) and long-term (sequential projects) optimization in project governance.
Learning	<ul style="list-style-type: none"> • Learning as part of intra-organizational portfolios and programs. • Institutional actors promoting learning in inter-organizational contexts: e.g., the role of educational and research institutes, professional associations, and consultants in enabling learning in inter-organizational multi-project contexts. • Mechanisms promoting synergies and transfer of knowledge in inter-organizational multi-project settings.

of the broader environment (Söderlund & Sydow, 2019; Sydow & Staber, 2002), potentially sharing the need to respond to institutional requirements and pressures or diverging in them. We did not cover project ecologies and the institutional field, and further research is encouraged specifically with clarity on the multiple projects and their parallel and sequential management in such contexts. Also, we did not cover the technologies and materials used and developed in the projects, but the socio-materiality in inter-organizational projects could offer additional relevant viewpoints for further research. Since both contractual and informal relationships exist in PBF's inter-organizational relationships, there is a need to further investigate the ramifications of the different types of relationships on the PBF's multi-project management.

6. Conclusion

This article contributes to the discussion on multi-project management by expanding the viewpoint from the projects of one parent organization to PBFs cooperating with their stakeholders in inter-organizational contexts. Thereby, this study responds to previous requests to expand the portfolio and program discourse toward stakeholders (Martinsuo & Geraldi, 2020; Vedel & Geraldi, 2020). In particular, we brought in stakeholder and agency theoretical perspectives (Ahola et al., 2014, 2021; Biesenthal & Wilden, 2014; Derakhshan et al., 2019; Martinsuo & Geraldi, 2020) and uncovered requirements specific to PBFs' multi-project management in inter-organizational contexts. In contrast to multi-project management in an intra-organizational context, multi-project management in the inter-organizational context poses additional challenges stemming from the versatility of the stakeholders involved (instead of only the parent organization), their position and power in the project network, different agency relationships, and different temporal orientations. These factors cause unique requirements for PBFs' multi-project management and offer a theoretical contribution to the dominantly intra-organizational multi-project management research.

Our analysis of the management of projects in parallel and in sequence yielded a framework of multi-project management requirements that should be taken into account in inter-organizational contexts. The PBF needs to acknowledge multiple organizations' strategies, resources, and governance and learning, when designing and implementing its own multi-project strategy. We revealed somewhat different managerial challenges when considering multiple projects in parallel vs. in sequence and the particular requirements covered in the research to date. While parallel projects tend to face versatile governance demands from the participating organizations and require exploitative approaches and negotiation, the management of sequential projects faces resource- and learning-related tensions and possibilities and is more explorative in nature and yet path dependent. A key contribution of this study is the thematic framework that combines the portfolio view (parallel) with a program-oriented lifecycle view (sequence) and adds learning as an issue to be considered as part of multi-project management. The framework could be used in mapping and analyzing multi-project circumstances in the forthcoming research. The developed propositions and new research ideas could be used in directing future research.

This study was limited in the sense that it did not cover first-hand empirical data. Identifying source materials for the study proved to be quite challenging because the concept of multi-project management is not used broadly or explicitly in inter-organizational contexts even if there have been empirical studies that explored situations where PBFs carried out several projects in parallel and/or in sequence. Indeed, we suggest forthcoming research to investigate these inter-organizational multi-project circumstances more and explicitly use concepts such as multi-project management and multi-project strategy (concerning a PBF), and inter-organizational portfolio and inter-organizational program (concerning a project network).

The conceptual framework developed in this study offers some practical implications for managers involved in PBFs' strategic management. Firstly, the framework advises clarity and explicitness in the multi-project strategy of the PBF. Managers of PBFs should not plan projects merely as reactions to customer requests, but they should steer and select projects based on strategic and long-term interests of capability building. Secondly, our framework guides managers to acknowledge the particular features in their inter-organizational context, when designing and implementing the multi-project strategy. In particular, there is a need to understand the PBF's and stakeholders' network positions and power, nature of the agency relationships, and different organization's unique temporal orientations. Thirdly, the framework provides guidance on how managers can take the different stakeholder and agency relationships into account in the project network, when implementing the multi-project strategy in resourcing, governance, and learning processes. The framework includes issues covered in previous research. Naturally, each organization needs to analyze its own inter-organizational context and consider their implementation practices selectively.

Declaration of Competing Interest

There are no conflicts of interest. Martina Huemann has handled the paper.

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Appendix. Articles included in the conceptual analysis and their classification according to the covered multi-project viewpoint

Authors	Method and context	Projects in parallel	Projects in sequence
Aaltonen et al. (2017)	Process-based case study in a city district development project	1	1
Ahola et al. (2008)	Qualitative case study focusing on a buyer-supplier dyad in project context		1
Ahola et al. (2013)	Qualitative case study focusing on a specific project supplier's entry to the Russian oil and gas market		1
Artto & Turkulainen (2018)	Single embedded case focusing on Neste Oil		1
Bakker et al. (2011)	Survey of inter-organizational projects, two waves	1	1
Bengtson et al. (2018)	Longitudinal case study of the relationship connections between three Swedish construction projects.		1
Bos-de Vos et al. (2019)	Exploratory interview study with architectural firms and among their clients	1	
Brady & Davies (2004)	Two case studies conducted in the telecommunication industry		1
Brady (2011)	Case study of a British airport operator, a program to develop a standardized approach to routine projects	1	1
Chronér & Backlund (2015)	Multiple-case study in Swedish engineering and construction firms implementing projects	1	
Davies & Brady (2016)	Conceptual paper		1
Davies et al. (2006)	Case study with five manufacturing and service firms delivering complex products and systems	1	1
Davies et al. (2009)	Single case study of Heathrow T5 project		1
Davies et al. (2016)	Longitudinal case study, British Airport Authority and the London Heathrow T5 project	1	1
Dille et al. (2018)	Case study of an emergency communication system in Norway	1	
Eccles (1981)	Interview study of homebuilders in the US.		1
Ekeskär et al. (2022)	Case study in a Swedish urban development district	1	
Frederiksen & Davies (2008)	Two illustrative examples drawn from the UK energy industry		1
Gann & Salter (2000)	Exploratory and multiple case study in design, engineering and construction firms	1	1
Griffith (2007)	Multi-method study in UK, small building works in construction industry	1	
Griffith (2011)	Longitudinal multiple-case study with three publicly procured small building works in construction industry	1	
Hadjikhani (1996)	Conceptual paper with two short illustrations of project deliveries (in Tunisia and China)		1
Hedborg et al. (2020)	Case study on a project ecology concerning an urban development district in Sweden; 11 parallel projects	1	
Hetemi et al. (2020)	Case study of Madrid-Barcelona high speed train		1
Hetemi et al. (2021)	Case studies of two high speed rail projects (Spain and Netherlands)		1
Hetemi et al. (2022)	Case study of Madrid-Barcelona high speed train	1	1
Hobday (2000)	Case study in a German equipment supplier firm producing complex products and systems	1	
Iftikhar and Ahola (2022)	Single case study of Lahore Orange Line Metro train project, interviews	1	
Järvenpää et al. (2022)	Case study of six infrastructure projects, with Swedish Transport Authority as the client		1
Kujala et al. (2013)	Qualitative case study, three cases		1
Kujala et al. (2021)	Case study in a large tunnel construction project in Finland, alliance contract	1	
Lehtinen & Aaltonen (2020)	Multiple-case study of two transport infrastructure projects in Northern Europe	1	
Lieftink et al. (2019)	Longitudinal case study, architectural firm, interorganizational projects		1
Ligthart et al. (2016)	Case study of shipbuilding in Netherlands, one interorganizational project		1
Manning (2005)	Structural network analysis of a German tv-production company		1
Martinsuo & Ahola (2010)	Multiple-case study of two complex delivery projects (international)	1	
Martinsuo et al., (2019)	Multiple-case study of three infrastructure project front ends, Finland	1	
Maurer (2010)	Survey, 218 projects in 144 firms in German engineering industry		1
Mello et al. (2015)	Multiple case study of six shipbuilding projects, Norway	1	
Mutka & Aaltonen (2013)	Qualitative case study (with five embedded cases)		1
Olsson (2008)	Action research concerning the project portfolio of a transport solution supplier firm	1	
Sorenson & Waguespack (2006)	Statistical analysis of US film industry data from 1982 to 2001		1
Stjerne et al. (2019)	Longitudinal case study of a transformation program concerning manufacturing industries, with 93 projects	1	
Sydow & Staber (2002)	Conceptual paper that draws examples from two German regions in which tv-production is carried out		1
Söderlund & Sydow (2019)	Conceptual paper; special issue editorial	1	
Turkulainen et al. (2015)	Single case study focusing on Neste Oil's biodiesel investments in Finland and abroad		1
Vuorinen & Martinsuo (2019)	Multiple-case study of three infrastructure projects, Finland	1	
Zerjav et al. (2018)	Inductive qualitative study of the delivery of London Heathrow Terminal 2		1

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