



Exploring the applicability of project alliancing to interorganizational projects: An alliance governance design matrix

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ABSTRACT

The academic discussion on relational forms of project governance in general and project alliancing in particular has centred on megaprojects. The applicability of project alliancing to other types of interorganizational projects requires more attention. The aim of project alliancing is to promote goal alignment and innovativeness across project actors by sharing risks and rewards through an alliance contract. As interorganizational projects are prone to inter-actor conflicts, it is necessary to understand the utilization of project alliancing in various kinds of interorganizational projects. The aim of this conceptual study is to scrutinize the applicability of project alliancing to varying interorganizational projects. Building primarily on the project governance, relational contracting, project network, and project alliancing literatures, we analyze the common alliance applicability criteria and relational governance mechanisms, and introduce an alliance governance design matrix. The matrix combines the criteria for alliancing applicability with governance mechanisms and reveals ways of matching them in various interorganizational projects. Evaluating governance mechanisms in project alliancing and their connections with the applicability criteria helps extend the applicability of alliancing to versatile contexts and resolve potential inter-actor conflicts. For practitioners, we offer a framework for assessing the applicability of project alliancing in delivering the expected solutions, choosing appropriate governance mechanisms, and assessing organizations' readiness to participate in alliances.

1. Introduction

Projects vary in their complexity, depending on their size and duration, the uniqueness of the end products, the number of stakeholders involved, and their economic and societal impacts on the participating actors (Shenhar, 2001). In today's economic environment, decision makers ponder on risks and options, considering which projects to implement and how their implementation should be managed from the project front end to the commissioning phases. For example, various urban development projects, such as housing projects, must fulfil the needs of both citizens and the organizations that implement them. Such projects are interorganizational, as multiple organizations (often from the public, private, and non-profit sectors) work together to coordinate the development of the final products (Clegg et al., 2002; Sydow & Braun, 2018). Research has shown that especially megaprojects involving multiple organizations are characterized by a high risk of failure (Davies et al., 2009; Flyvbjerg, 2014) due to, among other factors, the complexity caused by the multitude of heterogeneous

participants with partially diverging goals. Despite academics' and practitioners' considerable efforts to develop practices for managing complex projects, there is still a need to better understand how the goals of the participating organizations can be aligned.

This paper concerns relational contracting in various types of inter-organizational projects (IOPs). To address the challenge of actors' alignment in IOPs, the project network and project governance literature has explored governance approaches in projects of different types and sizes (DeFillippi & Sydow, 2016; Kujala et al., 2021; Miller & Hobbs, 2005; Müller et al., 2017; Song et al., 2022). Project governance often refers to the set of activities, guidelines, and rules that determine how projects are planned, executed, and managed across the participating firms (Miller & Hobbs, 2005; Müller et al., 2017). Various governance mechanisms have been suggested in the literature to achieve project goals, including contractual and relational mechanisms (Ahola et al., 2014; Steen et al., 2018). The rich discussion on project governance highlights the flexibility of governance mechanisms (Müller et al., 2017; Williams et al., 2010), the interplay between different mechanisms

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(Benítez-Ávila et al., 2018; Trauernicht et al., 2024; Zwikaël & Smyrk, 2015), and their dependence on different levels of analysis (project, portfolio, programme, or organizational; Derakhshan et al., 2019; Martinsuo, 2023; Müller et al., 2017).

In this study, we focused on project governance in an interorganizational context and paid special attention to the stream of literature on relational governance. We focused on a specific relational project delivery model, namely project alliancing. In this paper, project alliancing refers to a project governance approach that highlights collaborative activities between the participating organizations with a goal of making best-for-project and unanimous decisions on all key project delivery issues (DIRD, 2015; Walker et al., 2024b). Project alliance refers to a specific inter-organizational contract type where the key project actors commit to delivering the expected project outcome jointly and agree to share the risks and benefits of the entire project (Lahdenperä, 2012). The discussion on project alliancing has focused on practices for aligning the objectives of project actors to achieve a project's goals, ways to manage the relationships between actors, and actors' embeddedness beyond single projects (Jefferies et al., 2014; Lahdenperä, 2012; Walker et al., 2015).

Over the past two decades, project alliancing has received considerable academic attention, as the practitioner field has utilized project alliancing to govern various types of projects in different countries. Project alliancing has proven to be useful in governing large IOPs, such as infrastructure projects (Klakegg et al., 2016; Lahdenperä, 2012; Matinheikki et al., 2019; Walker et al., 2015), which often include long-term ownership arrangements concerning the delivered infrastructure. The numerous benefits of project alliancing, including the timely and budget-conscious completion of projects, have sparked a discussion among practitioners about its potential application to other types of projects, particularly those smaller in scale than megaprojects. Project alliancing can be inherently costly and laborious (for example, the establishment of an alliance organization) for organizations participating in an alliance (Bygballé & Svärd, 2019; Pargar et al., 2019), decreasing their motivation to establish alliances. A common argument for project alliancing, mainly in megaprojects, is related to increased alignment of goals of public and private sector actors and obtaining better value for money, especially from public projects (Jefferies et al., 2014; Walker et al., 2015). However, few empirical studies have explored the applicability of project alliancing (Chen & Manley, 2014; Chen et al., 2012; Jefferies et al., 2014). Thus, questions remain open regarding how applicable project alliancing is, why project alliancing is not more widely utilized across projects of various sizes and scopes, and what changes the approach might require to be more broadly utilized. In project alliancing, various innovative relational governance mechanisms are often utilized (such as the big room approach, team working, and cost and benefit sharing mechanisms), and the choice of mechanisms is highly dependent on the context (Lahdenperä, 2012; Walker & Lloyd-Walker, 2016). Consequently, this study aimed to scrutinize the applicability of project alliancing and its specific governance mechanisms by identifying commonly discussed applicability criteria for project alliancing and linking them to common alliance governance mechanisms. The goal was to develop a framework for assessing the applicability of project alliancing to different IOPs and selecting suitable governance mechanisms depending on the nature of each project. We posed the following research questions:

1. *How can project actors assess the applicability of project alliancing to various IOPs?*
2. *How can project actors choose relational governance mechanisms for project alliancing in various IOPs?*

We approached the phenomenon conceptually based on research published in journals oriented towards project organizing, focusing on empirical studies on relational project governance and project alliancing. We conducted a conceptual literature review to selectively identify

studies consistent with our research aim (Callahan, 2010) instead of seeking comprehensiveness through a systematic review (Elsbach & van Knippenberg, 2020). Our analysis focused on the project level in inter-organizational settings. The implementation of project alliancing in real-life contexts is associated with specific success factors that are beyond the scope of this study.

This study contributes to the ongoing discussion on relational governance (Song et al., 2022; Valkokari et al., 2024) and project delivery arrangements (Davies et al., 2019; Walker et al., 2024) by assessing the applicability of project alliancing across differing IOPs. The study highlights that project alliancing can be inherently customizable in its nature and could be applied more broadly to varying IOPs depending on the identified criteria. After the identification of governance mechanisms often utilized in project alliancing, we present an alliance governance design matrix that links these mechanisms to the applicability criteria to assess their connections. We contribute to recent project alliancing discussions (Aaltonen & Turkulainen, 2022; Kadefors et al., 2024; Nwajei et al., 2022; Tulokas et al., 2024; Walker et al., 2022) by addressing the flexible nature of project alliancing and exploring whether and how it could be utilized more widely across various IOPs. Thus, we also answer the call for more studies on relational governance in IOP settings (DeFillippi & Sydow, 2016; Kujala et al., 2021; Song et al., 2022), indicating potential gaps in the understanding of project alliancing and its applicability. For practitioners, the proposed matrix offers a novel way of assessing the applicability of project alliancing as a project delivery arrangement and selecting suitable governance mechanisms for projects in which this model may not have been utilized. We identify further gaps in the relational project governance and project alliancing literature to be addressed in the future.

The structure of this paper is as follows. We first discuss the theoretical premises of project governance research, focusing on relational governance in interorganizational settings. We then discuss empirical studies on project alliancing and assess the applicability and characteristics of project alliancing. Subsequently, we describe the proposed alliance governance design matrix. Finally, we discuss the implications of our study for research and practice and suggest avenues for future research.

2. Relational governance in IOPs

2.1. Relational governance

It has been suggested that long-term collaboration and trust between the actors involved in economic transactions are likely to contribute to favorable collaboration outcomes (Benítez-Ávila et al., 2018; Müller et al., 2017). In line with this reasoning, the interpersonal and inter-organizational relationships between contract parties are considered important determinants of the contract formation process (Macneil, 1977). Besides the explicit terms stated in a contract, the implicit understandings and expectations of the actors involved are likely to influence their behavior in the contractual relationship.

Scholars viewing project organizing through the relational governance lens have characterized IOPs as nexuses of transactions between the actors involved (Winch, 2006). Consequently, the discussion on relational governance in a project context addresses the interplay between the relational ties connecting the participating actors and their behavior in the project. A project governance structure may also include mechanisms based on relational norms of reciprocity, such as cross-organizational problem-solving teams and a no-blame culture (Brady et al., 2007). Overall, the purpose of a project governance structure is to enable the coordination, monitoring, and safeguarding of the activities that take place in an IOP.

2.2. IOP governance

Relational governance does not exclusively concern a specific firm's

relationships with others but extends to versatile relationships in an interorganizational network (DeFillippi & Sydow, 2016; Jones et al., 1997). Although not all projects are interorganizational, a crucial aspect of most projects is their association with other actors outside the focal firm's boundaries (Sydow & Braun, 2018). An IOP can be defined as a temporary endeavor that involves multiple organizations working together to achieve a common goal (Ahola, 2018; Hellgren & Stjernberg, 1995). IOPs temporarily combine the expertise of various actors to deliver a solution that cannot be produced by a single organization. However, as each organization is guided by its own objectives, it is necessary to align the interests of the various actors (Ahola, 2018). The governance of project networks is context-dependent (DeFillippi & Sydow, 2016; Guo et al., 2014; Kujala et al., 2021) and dynamic within and across individual projects and temporally embedded in history and previous experiences (Aaltonen & Turkulainen, 2022; Adami & Verschoore, 2018; Engwall, 2003; Hellgren & Stjernberg, 1995; Stjerne & Svejenova, 2016). Thus, managing the interorganizational relations of the participating actors becomes crucial.

IOP governance has versatile requirements. In a project context, governance is considered a multilevel phenomenon that encompasses the governance of the parent organization, any contractors or suppliers, and the relationships between them (Müller et al., 2017). Project networks are structurally embedded (through actors' mutual connections and differences in their centrality) and relationally embedded (through actors' different relationships) (DeFillippi & Sydow, 2016; Jones & Lichtenstein, 2008; Kujala et al., 2021; Manning, 2008; Matinheikki et al., 2016). The literature now distinguishes between the governance of a single project (i.e., internal to the project) and the governance of multiple projects by an organization (i.e., external to specific projects)—for example, in programmes or portfolios (Ahola et al., 2014; Biesenthal & Wilden, 2014; Müller et al., 2017).

The internal governance of an IOP implies that the project becomes an actor in its own right, formed by multiple organizations and directed through shared goals (Ahola et al., 2014). Such projects need to adopt tools and mechanisms for coordinating, controlling, and aligning the participating organizations' tasks and to ensure the pursuit of the set shared goals, as organizations may have conflicting goals (Gulati et al., 2005). DeFillippi and Sydow (2016) categorize the governance mechanisms of project networks into four dimensions: responsibilities (contract-based governance), routines (established project work activities and their monitoring), roles (authority assignments), and relations (social modes of governance). Kujala et al. (2021) divided the various dimensions of project network governance into goal setting, rewarding, monitoring, coordination, roles and decision-making, and capability building. These mechanisms operate both at the project and network levels and are partly determined and partly emergent in nature. Network can be governed by sharing the governance among participating organizations, assigning it to a leading organization, or using a separate network governance organization (Braun, 2018; Steen et al., 2018).

Research suggests that IOPs require both control-oriented and trust-oriented governance and that governance is inherently embedded in the institutional context. For example, Miller and Hobbs (2005) advocated building a governance framework that fits the circumstances of each large project and is allowed to develop and evolve over time. According to Brunet and Aubry (2018), IOPs interpret and "translate" the institutionalized governance framework that the owner organization may already have for their specific needs, and they must remain flexible to changing contexts. Benítez-Ávila and Hartmann (2023) demonstrated that managers used their agency and power in molding a project's working conditions by either enacting or driving change in the given governance framework in public-private partnership projects, which required moving between the project level and the organizational level. Ruijter et al. (2021) revealed practices of trust development and buffering potential trust losses in a Dutch infrastructure megaproject. These studies indicate that governance is context and situation specific and evolves over time through the actions and interpretations of the actors

involved in an IOP. Companies engaged in project networks would eventually need to acknowledge a longer-term view where network governance spans across multiple sequential or parallel projects (DeFillippi & Sydow, 2016).

The scale and scope of a project pose their own challenges to IOP governance. According to Ruuska et al. (2011), the management of contracts, supply networks and risks, work monitoring, organization of procurement and communication, and collaboration between project actors becomes crucial for the governance of large projects. From the goal alignment perspective, project partners need to find a balance between their own interests, the needs of others, and the needs of the project (Ligthart et al., 2016). Moreover, in the case of a public project, the participants may need to consider its societal impacts. Specifically, they need to consider how different governmental (such as local governments) and societal (such as NGOs and communities) actors also affect governance structures (Derakhshan et al., 2019; Di Maddaloni & Sabini, 2022; Ma et al., 2017; Song et al., 2022). Research has highlighted the specific industry and country contexts for governing IOPs, suggesting that the direct transfer of a governance framework from one country or industry to another may not be feasible (Klakegg et al., 2016; Ruuska et al., 2011).

With complex IOPs, organizations have noticed that the foundations for trust and relational capital are already built when they select partners and design and negotiate the contract that guides the project work (Aaltonen & Turkulainen, 2018). Matinheikki et al. (2016) highlight the cognitive dimension at the project front-end, where the shared vision is formed and can build trust between the involved actors. The project actors' socialization efforts continue during project development, when the project deliverable (e.g., a system or solution) is determined (Aaltonen & Turkulainen, 2018). Some good practices of control and trust have developed into principles of specific delivery models, contract formats, and governance models used in IOPs. Among them, we explored project alliancing.

2.3. Project alliancing as a governance approach

Various relational contracting approaches or collaborative project delivery models have been discussed (Engebø et al., 2020; Lahdenperä, 2012). Examples of such approaches are project partnering, project alliancing, and integrated project delivery (Lahdenperä, 2012). Citing the Department of Infrastructure and Regional Development of the Australian Government (DIRD, 2015, pp. 9–10), we can describe project alliancing as a relational governance approach in which "all parties are required to work together in good faith, acting with integrity and making best-for-project decisions. Working as an integrated, collaborative team, they make unanimous decisions on all key project delivery issues [...] Alliance agreements are premised on the joint management of risk for project delivery. All parties jointly manage that risk within the terms of an 'alliance agreement' and share the outcomes of the project."

The fundamental motivation for project alliancing often stems from recognizing the mutual benefits that arise from cooperative relationships between organizations (Engebø et al., 2020; Lahdenperä, 2012; Rahman & Kumaraswamy, 2002). As a way of organizing, project alliancing commonly relies on various governance mechanisms, such as the early involvement of actors, risk and reward sharing, joint decision-making, transparent financial information sharing, and collaborative agreements between multiple parties (Lahdenperä, 2012; Walker & Lloyd-Walker, 2016). These mechanisms aim to address the challenges of high uncertainty and often risky IOPs and to potentially improve project performance. Various projects have been completed successfully through alliancing—for example, in terms of time and budget (Bygballe & Svärd, 2019; Lahdenperä, 2017; Walker et al., 2015)—suggesting that project alliancing can successfully deliver large projects. However, projects utilizing alliancing exceeding budgets and/or schedules have also been reported (Walker et al., 2015). Systematic analyses of the success of different kinds of alliance projects in

various contexts are limited and biased towards the Australian context (Engbø et al., 2020). Thus, further studies in other contexts are needed.

Previous studies on project alliancing have focused on large or very large projects in different contexts. These studies have examined various aspects, such as value creation dynamics (Pargar et al., 2019), managing institutional complexity (Matinheikki et al., 2019), collaborative project identity formation (Hietajärvi & Aaltonen, 2018; Nyameke & Haapasalo, 2022), and collaboration and opportunism in alliance contracts (Galvin et al., 2021). Such studies have paid less attention to assessing the applicability of project alliancing to the investigated projects. Some basic characteristics of project alliancing have been identified, such as the need for better risk management through collaboration, the need for certainty in managing costs and completion times, increased project complexity, the need for innovation, complex stakeholder environments, and transparency requirements (Bresnen & Marshall, 2000; Hutchinson, 2024; Lahdenperä, 2012; Lu & Yan, 2007; Walker et al., 2015).

Especially in the practitioner field, questions have been posed regarding whether project alliancing is applicable to smaller-scale projects, such as housing projects. For example, Fernandes et al. (2018, p. 494) concluded that “the application of project alliancing to other everyday or routine building projects may well be pertinent and should be seriously considered.” In the health and social care sector, alliancing has also been utilized to bring together various organizations to improve the lives of the homeless and those suffering from mental illness (Hutchinson, 2024), thereby supporting the idea that alliancing is applicable beyond megaproject or infrastructure project contexts. Previous studies have reported issues that might hinder the implementation of project alliancing, such as insufficient time and governance of project consortia, a lack of experience with project alliancing, resistance to new ways of working, and inability to respond to changes (Bygalle & Svärd, 2019; Chen et al., 2012; Hietajärvi & Aaltonen, 2018; Pargar et al., 2019). In conclusion, we need a better understanding of the contextual elements and factors that promote (or hamper) alliancing in various projects.

3. Method

This study relied on a review of the literature on project alliancing, project organizing, project networks, and relational governance. A central objective of this review was to conceptually explore the relationship between relational governance mechanisms and alliance applicability criteria to advance the discussion on the use of project alliancing in various types of projects. Thus, our method resembled a conceptual framework development approach in which we carefully selected literature consistent with our research aim (Callahan, 2010). We combined theory adaptation (i.e., project alliancing complemented with the viewpoint of governance mechanisms) with framework development (i.e., identifying key requirements for and features of interorganizational alliances) from the alternative types of conceptual studies (by Jaakkola, 2020). In doing so, we combined separate knowledge bases in the narrow context under investigation to develop a conceptual argument, instead of seeking comprehensiveness through a systematic review (Elsbach & van Knippenberg, 2020). The integrative, conceptual approach is used for increasing knowledge and characterizing project-based firms' option space in choosing alliancing and its governance mechanisms. It does not, however, offer prescriptive guidance or explain the success potential in the use of alternative mechanisms, which will require further research.

To achieve our objective, we searched for empirical studies on project alliancing, with a focus on the reasoning behind choosing the alliance model and the kinds of governance mechanisms used in projects. We included only content written in English and published in peer-reviewed journals and books. We first reviewed papers published in journals such as the *International Journal of Project Management*, *Project Management Journal*, the *International Journal of Managing Projects in*

Business, *Project Leadership and Society*, and *Construction Management and Economics*. Subsequently, we adopted a snowball approach, exploring the reference lists of relevant articles to identify additional papers. We started the search using search terms directly derived from the project alliancing and relational governance literature (e.g., *project alliancing*, *alliance projects*, *relational governance*, *governance mechanisms*, and *alliance governance*). We then continued our search more liberally, selecting articles that covered these themes implicitly. We mostly excluded articles dealing with other types of collaborative project delivery models (such as project partnering, integrated project delivery, and lean project delivery), except when discussing the premises of project alliancing and closely related concepts. After manually screening each article's title, abstract, and keywords, we included 35 articles in the analysis.

When analyzing the articles, we systematically considered multiple factors, including the context of each study (e.g., construction industry), the size and scope of each project, governance mechanisms, the reasoning behind the choice of project delivery model, and the organizations involved. The settings examined in the selected studies were diverse, and not all issues were covered in every study. We employed an iterative analysis process involving several meetings in which we discussed the emerging concepts and their interconnections. This process resulted in the identification of the applicability criteria for project alliancing discussed in the included studies. We categorized these criteria into six groups (see Fig. 1, letter codes A..F will be used to refer to each criterion) by first identifying the individual arguments for choosing the project alliancing as governance approach and then grouping similar factors. We assessed the similarity of arguments by focusing on each project's scope, process complexity, outcomes, stakeholder environments, risks, innovations, and the competencies of the involved actors, as these factors tended to be central to the discussions in the included studies.

Subsequently, we focused on identifying the governance mechanisms discussed in the project alliancing literature. We identified most of these mechanisms based on Lahdenperä (2012), supplemented by more recent conceptual and empirical studies. We slightly modified Lahdenperä's (2012) categorization of mechanisms into six groups to suit the purposes of our study (numbers 1...16 will be used to refer to each mechanism). Finally, we linked the governance mechanisms to the identified alliance applicability criteria (Table 1) by cross-tabulating article by article carefully which governance mechanisms (number codes 1..16) were covered in conditions of specific alliance applicability criteria (letter codes A..F). Since several different studies covered multiple combinations of mechanisms, we report a list of articles for each combination of mechanisms and applicability criteria. We compiled the results into one column of Table 1 by reviewing the empirical papers and their discussions on governance mechanisms and specific applicability criteria.

For example, Aaltonen and Turkulainen (2018) state, “Procurement workshops were the key events to facilitate the shared understanding between the buyer and the supplying consortium” (p. 1397). We coded this to relate governance mechanism 15 to applicability criterion C by alleviating the creation of a strong shared understanding and working relationships between stakeholders. Similarly, Love et al. (2016) state, “Paper-based manuals were replaced with a customized series of web-based process flowcharts to improve process clarity.” We coded this as mechanism 16 and applicability criterion B, as this mechanism potentially reduces process uncertainty. Furthermore, Jefferies et al. (2014) discussed the establishment of specific targets and their division into smaller “tranches” throughout a project as a success factor in project alliancing. We interpreted this result concerning applicability criterion A and mechanism 1, which aligns ways of working especially in long-term projects. The project studied in the paper can be considered both large and lengthy in duration.

Although the included studies did not consistently address these issues explicitly, we conducted a detailed analysis of the article content, contextual factors, and governance mechanisms to uncover relevant

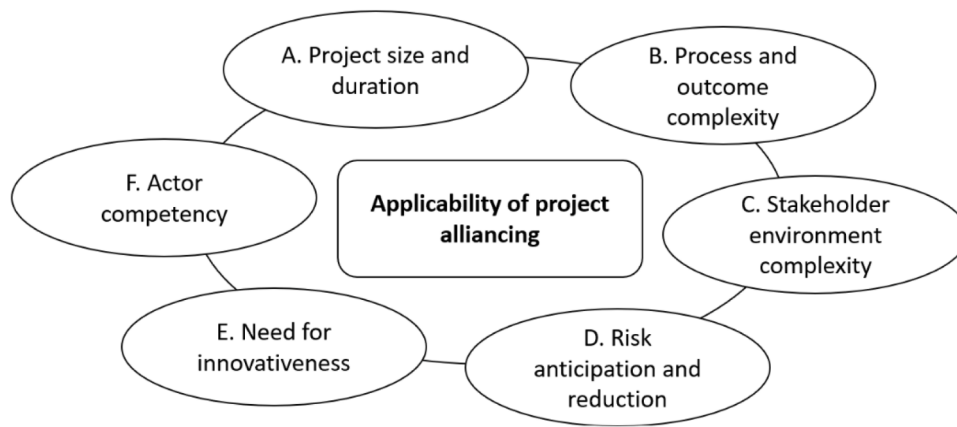


Fig. 1. Project alliancing applicability criteria.

connections and assess their applicability. Instances where a specific issue was not addressed in any study are denoted by a dash (–), indicating that neither the authors nor the empirical data in the analyzed papers discussed the corresponding connection.

In the final step of this phase, we created a matrix (Fig. 2) to visually present the conclusions drawn from our analysis. We assessed the use of each mechanism in relation to specific applicability criteria by evaluating the extent and relevance of the discussions in the included studies. The objective was to highlight associations between different types of situations where alliancing has been deemed as applicable and the mechanisms that were reported being used in such situations in the previous research. This is indicated in the matrix by color codes. The black boxes indicate an aspect whose importance was highlighted in several papers and, thus, a mechanism's relevance to a certain applicability criterion was considered as high. The white boxes indicate minimal or no discussion, thus, low relevance. The grey boxes represent cases in which the relationship was unclear, or the effects of certain mechanisms were inconsistent or contradictory, and we indicated this as moderate relevance.

To assess the validity of the developed framework, we conducted a step of (beta) testing that is typical to design science research (Romme & Holmström, 2023). According to Romme and Holmström (2023), various scientifically suitable methods can be used for beta testing, when creating frameworks and tools that may be intended both for theoretical and practical use. With this purpose, we organized a two-hour workshop with experts to validate and test the alliance governance design matrix as a framework. These two experts work for a large construction company and have extensive experience in several alliance projects throughout their careers. The workshop was facilitated by two researchers and began with a discussion on the criteria for alliance applicability. The experts were asked to share the criteria they have encountered in various alliance projects. The second discussion topic focused on alliance governance mechanisms and the design matrix. The experts identified any missing mechanisms, discussed how various mechanisms could be utilized in different alliance projects, and evaluated the importance of these mechanisms in terms of the applicability criteria. The workshop was recorded and transcribed. The main revelations from this workshop are included in the respective sections in the discussion chapter.

4. Applicability of project alliancing to IOPs

4.1. Assessing the applicability of project alliancing

To better understand how project alliancing can be applied to various projects, it is necessary to identify the relevant criteria. Various endogenous and exogenous criteria have been discussed (see, e.g., Chen

et al., 2012; DIRD, 2015; Hutchinson, 2024). A summary of these criteria is presented in Fig. 1. The most commonly discussed criteria that are suitable for assessing the applicability of project alliancing to IOPs are related to the size and duration of a project, the complexity of the process and its outcomes, the complexity of the stakeholder environment, the anticipation and reduction of risks, the requirement for innovativeness, and the competency of the actors involved. We acknowledge that the criteria concerning the applicability of alliancing are to some extent interconnected as illustrated in Fig. 1. A single criterion would not determine the choice of project alliancing but is likely to be a combination of various criteria. Moreover, it is also questionable to put the criteria in any particular order in terms of priority as the contexts (for example, project type or decision-making process) where alliancing is utilized vary. The broader institutional context in terms of historical, country, or cultural factors may also affect whether project alliancing is chosen or not (Kadefors et al., 2024; Walker et al., 2024). How different criteria affect each other and how this in turn affects the choice of project alliancing are out of the scope of this study.

Alliancing has mostly been employed in megaprojects, which require large investments and aim for the long-term use of project outcomes. According to the DIRD (2015), project alliancing is not applicable to small projects. Research on project alliancing has often focused on large infrastructure projects, such as railroads (Aaltonen & Turkulainen, 2018, 2022; Plantinga & Dorée, 2016), water infrastructure (Jefferies et al., 2014; Love et al., 2016), and road tunnels (Aaltonen & Turkulainen, 2022; Kivilä et al., 2017; Lahdenperä, 2017; Matinheikki et al., 2019). The reasons for employing alliancing in these types of projects are often related to potential scope changes during long-term projects, which require actors to quickly adapt to environmental changes (Brookes et al., 2017), or to the cost of forming alliances (DIRD, 2015). Regarding project duration, it has been debated whether it affects the choice of alliancing (aiming for quick results vs committing to long-term relationships between alliancing partners; Che Ibrahim et al., 2017; Walker & Lloyd-Walker, 2016). These examples show that, although alliancing is generally studied in the context of large or very large projects, size has not been explicitly suggested as a fundamental reason for choosing this model, as even the definition of a megaproject (or even a large project) varies.

Many scholars agree that the complexity of a project's process and its expected outcomes largely determine whether alliancing is selected. Complexity may refer to technological, outcome, or the delivery process complexity (Che Ibrahim et al., 2017; Chen et al., 2012; Galvin et al., 2021; Walker et al., 2024a). For example, according to Turner and Simister (2001), high process and product uncertainty favours project alliancing, as this uncertainty can be shared between and managed by the project participants. Similarly, according to Walker et al. (2015), selecting the alliance approach is conditional on contextual factors (e.g.,

Table 1

Alliance governance mechanisms and their relation to applicability criteria.

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
Planning emphasis			
1. Goal alignment	The project goals are jointly developed	Chen et al. (2012); Hietajärvi et al. (2017); Jefferies et al. (2014); Kivilä et al. (2017); Kujala et al. (2021); Love et al. (2010); Walker et al. (2024b)	A: Aligns ways of working, especially in long-term projects B: Reduces project outcome uncertainty C: Increases familiarity with project stakeholders and their goals in advance D: Improves risk anticipation E: Clarifies potential innovation needs and goals; helps to find innovative ways of working F: –
2. Agreeing on a shared vision and culture for the project	Ultimately concerns why the project is carried out; culture refers to ways of working in alliance projects	Clegg et al. (2002); Hietajärvi and Aaltonen (2018); Hutchinson (2024); Kujala et al. (2021); Love et al. (2016); Winch and Leiringer (2016)	A: Helps to plan working, especially in long-term and public projects B: Directs the way of working and reduces process complexity C: Aligns the interests of all stakeholders and justifies the need for the project (especially in the case of public projects) D: Reduces the risk of a project being illegitimate and unaccepted; managing the reputational risk E: Embraces innovative ways of working F: –
3. Involvement of external alliance consultants (facilitators, experts)	External partners may need to be involved to facilitate the formation of the alliance and/or work	Aaltonen and Turkulainen (2018); Jefferies et al. (2014); Kujala et al. (2021); Lahdenperä (2012)	A: Clarifies the formation of the alliance, especially in large projects B: Reduces uncertainty about how to form an alliance and how to work in it C: Facilitates stakeholder collaboration D: Contributes to risk identification E: – F: Identifies partners' previous experiences with project alliancing
Administrational consistency			

Table 1 (continued)

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
4. Establishment of an alliance organization	Removing attachments to individual organizations and adopting, for example, a single alliance name	Aaltonen and Turkulainen (2018, 2022); Che Ibrahim et al. (2017); Chen and Manley (2014); Hietajärvi et al. (2017); Jefferies et al. (2014); Kujala et al. (2021)	A: Clarifies the ways of working and liabilities, especially in large alliance consortiums B: Aligns ways of working and reduces process uncertainty C: Enhances collaboration between stakeholders D: Facilitates risk sharing and anticipation E: Enables better innovation process outcomes through closer collaboration F: Facilitates partners' competence utilization
5. Joint decision-making	Each party has a say, and decisions are made unanimously or on a majority basis	Aaltonen and Turkulainen (2022); Chen and Manley (2014); Chen et al. (2012); Kivilä et al. (2017); Lahdenperä (2012); Love et al. (2016)	A: – B: Reduces uncertainty about what has been agreed C: Allows all stakeholders' opinions to be heard; commits stakeholders to the decisions made D: Facilitates discussion on potential risks; decisions on managing risks are made unanimously E: Enables unanimous decision-making for innovation practices F: –
Commercial unity			
6. Alliance contract / mutual liability waivers	Concerns the signing of a formal contract between partners; needs to include a pain/gain sharing mechanism; partners agree on no litigation or arbitration between them	Aaltonen and Turkulainen (2022); DIRD (2015); Hietajärvi et al. (2017); Lu and Yan (2007); Suprpto et al. (2016); Yeung et al. (2007)	A: Defines liabilities, especially in large-scope projects B: Addresses project complexities and uncertainties; some flexibility needs to be accepted C: Defines the stakeholders under the alliance contract D: Includes a risk management plan E: – F: Defines partners' resources and competencies
7. Risk- and opportunity-sharing /	Defines shared savings and overruns	Bresnen and Marshall (2000); Chen and Manley	A: Defines an incentive scheme for all project

(continued on next page)

Table 1 (continued)

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
incentive scheme and continuous performance monitoring	according to the realized cost performance of the project in relation to set target outrun costs; various qualitative key performance indicators can also be included	(2014); Chen et al. (2012); Guo et al. (2014); Jefferies et al. (2014); Kujala et al. (2021); Nwajei et al. (2023); Pargar et al. (2019); Walker et al. (2015)	phases B: Addresses uncertainties, contributes to potential risk sharing, and enables up-to-date information on performance C: Clarifies stakeholders' responsibilities, ability to bear potential risks, and performance throughout the project D: Defines risks and opportunities/ incentives and how they are shared E: May provide incentives for innovation F: –
8. Open book principle / transparent financials	A partner's costs are known to all other key partners, meaning that they operate on an open book basis	Aaltonen and Turkulainen (2022); Chen et al. (2012); Galvin et al. (2021); Hutchinson (2024); Kujala et al. (2021); Lahdenperä (2012); Love et al. (2011)	A: Monitors financials and progress especially in large-scope projects B: Reduces uncertainty about information asymmetry and potential opportunistic behaviour among partners C: Focuses on getting information from all stakeholders under the alliance contract D: Reduces risks of opportunistic behaviour; enables up-to-date information on potential shared financial risks; data security needs to be addressed E: – F: Defines partners' ability to share information and capabilities of using appropriate information-sharing systems
Cooperative culture			
9. Continuous communication among all stakeholders	The project participants actively share information with each other and with external stakeholders	Che Ibrahim et al. (2017); Chen and Manley (2014); Chen et al. (2012); Kivilä et al. (2017); Kujala et al. (2021); Lloyd-Walker et al. (2014);	A: – B: Reduces process-related uncertainties and outcome uncertainty in case of changes C: Focuses on external communication

Table 1 (continued)

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
		Love et al. (2010); Walker et al. (2024b)	about project status and societal impacts in the case of public projects D: Facilitates risk management, as potential problems are continuously discussed E: Continuous discussion with various stakeholders facilitates learning that support innovation processes F: Promotes the utilization of partners' knowledge
10. Flexibility and adaptability	All participants adapt to flexible ways of working and potential changes	Galvin et al. (2021); Hutchinson (2024); Jefferies et al. (2014); Kujala et al. (2021)	A: – B: Enables partners to adapt to uncertain situations and react to changes C: Allows adjusting working cultures between organizations D: Increases readiness to anticipate and react to potential risks E: Enables innovative ways of working and innovative solutions throughout the project F: Highlights partners' history of and readiness for flexible ways of working
11. Strong commitment, trust building, and conflict resolution principles	The participants are highly committed to project goals and trust each other; effective conflict resolution principles are developed	Aaltonen and Turkulainen (2022); Chen et al. (2012); Galvin et al. (2021); Hietajarvi et al. (2017); Hutchinson (2024); Jefferies et al. (2014); Kujala et al. (2021); Lahdenperä (2012); Lloyd-Walker et al. (2014); Suprpto et al. (2016)	A: Facilitates the completion of large and long-term projects B: Enables partners to handle uncertainties C: Enables better resolution of internal conflicts and trust-based working relations between partners D: Enables open communication about project risks E: – F: Trust and relational capital may have been built in previous projects (experience of working together)

Team formation and team working premises

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Table 1 (continued)

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
12. Early actor involvement	The project actors are already involved in the early phases of the project (planning, bidding, design)	Che Ibrahim et al. (2017) ; Kier et al. (2023) ; Lahdenperä (2012, 2017) ; Walker et al. (2024a)	A: Commits partners early, especially in long-term projects and projects with high societal impacts B: Diminishes project-related uncertainty among partners by enabling them to handle it early on C: Familiarizes internal and external stakeholders with each other early on D: Reduces potential design and planning risks E: Enables the search for innovative practices and the delivery of innovative end products F: Identifies the availability of resources in the early phases
13. Careful team selection	Alliance partners are carefully chosen to maximize the performance required to achieve the project goals; personnel need to be team players	Aaltonen and Turkulainen (2018) ; Chen et al. (2012) ; Guo et al. (2014) ; Hietajärvi et al. (2017) ; Hutchinson (2024) ; Jefferies et al. (2014) ; Kujala et al. (2021) ; Nwajei et al. (2022) ; Suprpto et al. (2016) ; Walker et al. (2024b)	A: Highlights the availability of key actors throughout long-term projects B: Supports the achievement of project goals through teams' independence and the selection of the most suitable working methods C: Promotes compatibility between stakeholders D: Supports better risk management, especially during project implementation E: Promotes innovative ways of working, as teams can select their own working methods F: Highlights a "team player" attitude and the availability of the best key individuals
Operational procedures			
14. Big room or co-location approach	Partners share the same working premises	Aaltonen and Turkulainen (2018, 2022) ; Galvin et al. (2021) ; Jefferies et al. (2014) ; Lahdenperä	A: Facilitates collaboration, especially in long-term and large projects B: Enables the reduction of uncertainties, as

Table 1 (continued)

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
		(2012) ; Pargar et al. (2019)	people work close to each other; makes the status of the project constantly visible (big room approach) C: Facilitates collaboration, especially if the number and variety of internal stakeholders increase; enables effective cross-team communication D: Enables more effective risk management through closer collaboration E: Promotes innovative working practices F: Highlights the cost of establishing co-location premises and binds resources outside the focal organization
15. Workshopping across the project's life cycle	Regular workshops are held in each project phase to create strong working relationships and solve problems	Aaltonen and Turkulainen (2018, 2022) ; Chen and Manley (2014) ; Hietajärvi et al. (2017) ; Jefferies et al. (2014) ; Kier et al. (2023)	A: – B: Enables problem-solving and the clarification of objectives in high-uncertainty situations C: Creates strong working relations and a shared understanding between the participating organizations D: Enables risk identification and the planning of risk management practices, especially in early workshops E: Promotes innovative problem-solving F: Highlights resource requirements for every workshop; benefits need to exceed costs
16. Use of building information modelling and similar collaborative technologies	Suitable technologies are used to increase information availability and facilitate information flow	Aaltonen and Turkulainen (2022) ; Chen and Manley (2014) ; Jefferies et al. (2014) ; Kujala et al. (2021) ; Lahdenperä (2012) ; Love	A: – B: Increases information availability and facilitates information flow; potentially increases process clarity C: Facilitates

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Table 1 (continued)

Alliance governance mechanism	Description	Sources	Relations to alliance applicability criteria
		et al. (2016); Walker et al. (2024b)	information flow across stakeholders D: Enables better risk anticipation and management E: Supports innovative working practices and innovative project outcomes, especially in the design phase F: Determines the availability of suitable technologies, partners' readiness to use them, and their costs

history, political environment), including a high level of uncertainty, and Hutchinson (2024) states that if there is a lot of certainty or little need for change, alliance is not necessarily needed. High uncertainty requires contract flexibility to enable adaptation to new conditions

(Rahman & Kumaraswamy, 2002).

To complement the previous point, the stakeholder environment in IOPs is often complex. Many different stakeholder groups may participate in a project, creating the need to manage individual requirements and set common goals for the project to succeed (Che Ibrahim et al., 2017; Klakegg et al., 2016). The alliance model has been proven to be applicable to such situations due to its focus on a collaborative “best for project” environment and common goals rather than individual actors’ goals (Lahdenperä, 2012; Walker et al., 2015). Moreover, especially public projects are connected to wider institutional environments (Aaltonen & Turkulainen, 2022; Engwall, 2003; Hutchinson, 2024; Matinheikki et al., 2019; Walker et al., 2024a), thus creating complexity in managing various interorganizational relationships and interfaces throughout a project. Project alliancing can enable better collaboration between public and private sector actors, considering public opinion when a project has wider societal impacts (Hutchinson, 2024; Kivilä et al., 2017; Sanderson et al., 2018; Walker & Lloyd-Walker, 2016).

The anticipation and reduction of risks are often discussed in the context of project alliancing, as this approach may be very useful for managing known and unknown risks in various phases of a project. The risks of project alliancing may be relational (such as having an unskilful or uncooperative partner) or may be related to performance (not achieving the alliance’s objectives, even when partners cooperate; Langfield-Smith, 2008). The impossibility of identifying all the risks beforehand (Gil, 2009) favours relational contracting approaches (Galvin et al., 2021). At the core of project alliancing is an agreement to share the risks and benefits between project participants from the

		Alliance applicability criteria					
		A. Project size and duration	B. Process complexity and outcome	C. Stakeholder environment complexity	D. Risk anticipation and reduction	E. Need for innovativeness	F. Actor competency
Alliance governance mechanisms	1. Mutual goal alignment						
	2. Agreeing on shared vision and culture of the project						
	3. Involvement of external alliance consultants						
	4. Establishment of the alliance organization						
	5. Joint decision-making						
	6. Alliance contract / Mutual liability waivers						
	7. Risk and opportunity sharing / Incentive scheme and continuous performance monitoring						
	8. Open book principle / Transparent financials						
	9. Continuous communication to all the relevant stakeholders						
	10. Flexibility and adaptability						
	11. Strong commitment, trust building, and conflict-resolution principles						
	12. Early actor involvement						
	13. Careful team selection						
	14. Big room or co-location approach						
	15. Workshopping across project life cycle						
	16. Use of BIM and similar collaborative technologies						

Fig. 2. Alliance governance design matrix.

beginning of a project (DIRD, 2015; Galvin et al., 2021; Hutchinson, 2024), as proper risk sharing often plays an important role in achieving positive project alliancing outcomes (Chen et al., 2012; Guo et al., 2014; Love et al., 2011; Turner & Simister, 2001).

In terms of the requirement for innovativeness, collaborative project delivery approaches have been seen to foster innovation in projects (Che Ibrahim et al., 2017; Lloyd-Walker et al., 2014) as actors are working closely together towards common goals and at the same time, sharing the risks and rewards. Innovations are sought for both the designed and delivered solutions and the practices of planning and implementing the project itself. For example, Kivilä et al. (2017) reported that a tunnel project sought and achieved innovations in solution delivery to minimize project costs. Innovative project delivery approaches can provide new ways of collaborating and improve performance (Poirier et al., 2016). Project alliancing is thought to improve innovation processes through closer team collaboration and highly integrated teams (Walker & Lloyd-Walker, 2016; Walker et al., 2024b), as this way of working combines the expertise of various partners (Lahdenperä, 2012). Thus, project alliancing may be more applicable to projects that seek innovative outcomes and practices throughout their life cycles.

The competency of the actors involved, past alliancing experiences, and resource availability have also been discussed as factors affecting whether to choose the project alliancing approach (Bygballé & Svärd, 2019; Lu & Yan, 2007). A project owner's familiarity with the ways of working related to project alliancing may favour utilizing this approach in the future, especially if previous results have been positive (Bresnen & Marshall, 2000; Vaez-Alaei et al., 2022; Vilasini et al., 2014; Walker & Lloyd-Walker, 2016). The experience of partners in previous projects may also encourage them to utilize project alliancing, if they trust each other (Aaltonen & Turkulainen, 2022; Galvin et al., 2021; Walker & Lloyd-Walker, 2016). Moreover, the resources available to project participants should be considered, as commitment is a key principle that requires sufficient resources (DIRD, 2015; Lu & Yan, 2007). Alliancing requires commitment to collaboration from the participating organizations, and more importantly, willingness to establish an alliance from the commissioner and other collaborating actors (Hutchinson, 2024). Access to the expertise of various actors may also encourage the choice of alliancing, as the alliance model inherently promotes information sharing and trust building among participants (Walker et al., 2024a).

4.2. Identification of governance mechanisms in project alliancing and their relatedness to applicability criteria

For a deeper understanding of relational governance in project alliancing, it is necessary to thoroughly investigate the governance mechanisms employed in different IOPs, as the applicability of the alliancing approach is manifested through the use of these mechanisms. Table 1 summarizes the frequently utilized governance mechanisms identified in previous research based on Lahdenperä's (2012) categorization. The mechanisms are numbered from 1 to 16. The applicability criteria shown in Fig. 1 are labelled A–F (A=project size and duration, B=process and outcome complexity, C=stakeholder environment complexity, D=anticipation and reduction of risks, E=requirement for innovativeness, F=competency of actors).

4.2.1. Planning emphasis

An emphasis on planning practices early on promotes the joint establishment of a project's goals, a common culture, and shared ways of working agreed upon by all stakeholders involved. This helps reduce uncertainty about project outcomes and align the interests of the various stakeholders from the beginning (Hietajärvi & Aaltonen, 2018; Lahdenperä, 2012; Love et al., 2010). Hutchinson (2024) emphasizes that while properly established project alliance possesses a strong sense of identity and cohesion from the outset, achieving this is neither easy nor quick. This is particularly important for long-term projects and projects in which both public and private sector actors are involved. The

careful planning of project alliancing can also be considered crucial for risk management; hence, the alliance model has often been adopted in complex infrastructure projects (Vilasini et al., 2014) that concern society at large and in which various types of risks exist (e.g. risks related to the use of public money and environmental concerns). In the early phases, sometimes external partners (consultants, coaches) may need to be involved to facilitate the formation of an alliance (Aaltonen & Turkulainen, 2018), revealing and formulating the goals of the participants, and potentially coach and mentor the participants of project alliancing working culture (Walker et al., 2024b). However, empirical evidence of their role seems to be scarce.

4.2.2. Administrative consistency

Administrative consistency is aimed at tackling issues related to the establishment of an alliance organization, joint decision-making processes and ensuring the equality of the actors involved (Lahdenperä, 2012; Yeung, 2007). The basic premises of alliancing are that a separate alliance organization is established, in which each party has a say, and decisions are jointly made (Chen et al., 2012; Walker & Lloyd-Walker, 2016). This organization can consist of several levels such as alliance leadership team, alliance management team, and an alliance manager or director (Hutchinson, 2024). Alliance organizations and joint decision-making have been discussed particularly in terms of improving collaboration between stakeholders and increasing their commitment to the decisions made (Jefferies et al., 2014; Sakal, 2005). The establishment of an alliance organization is most strongly linked to project size and duration and the management of complex stakeholder environments and the participating actors' competencies. Joint decision-making helps to anticipate risks and manage various complexities in terms of the process, outcomes, and stakeholders. These mechanisms may also promote innovative practices and outcomes (Kivilä et al., 2017), as the mechanisms force the actors to work closely together towards the same goals. More research is needed to gain a deeper understanding of innovation practices in alliance organizations and how various organizational arrangement fosters innovation.

4.2.3. Commercial unity

Mechanisms related to commercial unity concern especially negotiating an alliance contract and a risk- and opportunity-sharing scheme between participating actors (Lu & Yan, 2007; Pargar et al., 2019) to avoid divergences in interpretation of the scheme. Moreover, alliances often adhere to open book principles, whereby all partners are made aware of each other's financials (Galvin et al., 2021). Most of these mechanisms concern risk management and aim to reduce uncertainties and complexities in project alliancing. The role of each actor is specified in the contract, which also stipulates how risks should be shared throughout a project (Love et al., 2010; Suprpto et al., 2016; Walker et al., 2015). However, a relational governance perspective suggests that not everything can be specified in a contract. Contracts and legal agreements support collaboration but cannot, by themselves, create it (Hutchinson, 2024). For this reason, partners also rely on collaborative approaches and collective ownership, especially in cases of unexpected events (Galvin et al., 2021; Love et al., 2011). Moreover, a transparent governance structure has been found to promote the development of trust-based relationships (Galvin et al., 2021). However, few studies have examined how an alliance contract supports innovative practices or promotes project outcomes or whether these principles can also be applied to smaller-scale projects.

4.2.4. Cooperative culture

At the core of project alliancing are mechanisms designed to establish and maintain cooperation between participants. In project alliancing, a cooperative culture is fostered through continuous communication among all stakeholders to ensure transparency and collaboration (Chen et al., 2012; DIRD, 2015). The aim of project alliancing is to enable the participants to adapt to flexible ways of

working and potential changes, which may help to align working cultures between organizations (Brunet & Aubry, 2018; Walker & Lloyd-Walker, 2016) and increase their readiness to anticipate and react to potential risks (Lahdenperä, 2017). A strong commitment to project goals, trust building, and effective conflict resolution principles are also essential (DIRD, 2015). Stakeholders' experiences of working in alliance projects and relevant competencies are related to the use of such mechanisms and the way in which a cooperative culture is created (Vaez-Alaei et al., 2022). Especially in sequential alliance projects, partners know each other from previous projects, which may promote a cooperative culture in future projects (DIRD, 2015; Lahdenperä, 2012). A cooperative culture has been suggested to be a key factor in enabling innovative practices in project alliancing (Che Ibrahim et al., 2017; Hietajärvi et al., 2017). The no-blame culture and supportive environment where information is actively shared have been suggested to result in organizational learning that supports also innovation (Lloyd-Walker et al., 2014). However, the formation of such a culture is challenging and often takes time (Clegg et al., 2002; Hutchinson, 2024; Jefferies et al., 2014).

4.2.5. Team formation and team working premises

Team working and how teams are formed are essential elements of project alliancing. It has been shown that it is crucial for key actors to be involved in the initial phases of planning, bidding, and design so that all stakeholders are aligned and can contribute effectively from the outset (Aaltonen & Turkulainen, 2018; DIRD, 2015). This necessitates the careful selection of alliance partners to achieve a project's goals. Partners should be chosen not only for their technical expertise but also for their ability to collaborate. Moreover, it is important for personnel to have a "team player" attitude and that the team is highly integrated and multi-disciplinary by nature so that a wide variety of perspectives are explored (Walker et al., 2024b). Successful team selection can contribute to mitigating uncertainties and complexities (e.g. design mistakes) in alliance projects by enabling the early utilization of actors' expertise (Lahdenperä, 2012; Walker et al., 2024a). It has been suggested that project alliancing thrives when relationships between people are strong, and the early relationship building helps to develop resilience to face the challenges later on (Hutchinson, 2024). The competency of the involved actors is highlighted when selecting members for the alliance. However, the early involvement of actors and the formation of well-working teams can also be costly and may take time (Hutchinson, 2024; Nwajei et al., 2022).

4.2.6. Operational procedures

Lastly, operational procedures refer especially to mechanisms designed for the implementation phase of the projects including mechanisms such as co-locating people, workshoping and the utilization of various technologies for collaboration. Projects utilising alliancing often adopt the big room or co-location approach, whereby partners share working premises to enhance collaboration and communication (Galvin et al., 2021; Pargar et al., 2019). Regular workshops throughout a project's life cycle can help to build strong working relationships and resolve any issues that arise (Aaltonen & Turkulainen, 2018; Kier et al., 2023). Various operational procedures and governance mechanisms can mitigate alliance-related risks and uncertainties by enabling effective cross-organizational and cross-team communication. However, some mechanisms (e.g. big room or co-location approach) may be costly, especially for smaller projects. Moreover, merely adopting the co-location approach is not sufficient; emphasis should also be placed on various socializing mechanisms (Aaltonen & Turkulainen, 2018). Building information modelling (BIM) and similar collaborative technologies have also been utilized in many projects, as they can increase information availability and flow between actors (Chen & Manley, 2014), thus, facilitating the integration and learning across organizations (Walker et al., 2024b). However, more research is needed to identify the technologies that best support alliancing and to determine

how they can be used and how they can mitigate (or not) complexities in various projects.

5. Discussion

5.1. Assessing the project alliancing applicability

As a form of governance approach, project alliancing can address challenges related to goal alignment between actors and promote a cooperative culture to ensure that a project brings value to all parties involved. Although the applicability of project alliancing has received some attention, this study was motivated through the need to systematically identify its criteria for different circumstances. In this study and in relation to the first research question, we attempted to fill this gap by analyzing academic literature discussing project alliancing. Our analysis revealed six distinct criteria and the results suggest that project alliancing could be applied more broadly to various IOPs depending on the various criteria and contextual factors.

Our analysis shows that the discussion on project alliancing has focused on large and very large projects, especially in the construction sector in Australia and the Nordic countries (Kadefors et al., 2024). However, some examples of alliancing were also found, for example in the health and social care sector (Hutchinson, 2024) and renovation project context (Fernandes et al., 2018). A common argument seems to be that project alliancing is not suitable for projects smaller in scope. Based on the analysis, scope is not necessarily the fundamental reason to accept or reject project alliancing as a relational project delivery approach as many other factors, such as complexity of the offering or the process, need to be considered as well. Our analysis acknowledges the interconnectedness of the criteria, indicating that multiple criteria must be considered simultaneously when decision makers contemplate choosing project alliancing.

In addition to more product or process related aspects, the analysis revealed a variety of human factors affecting the governance choices. For example, as one of the criteria, actor competencies and project owners' or contractors' previous experiences and preferences (Bresnen & Marshall, 2000; Vilasini et al., 2014; Walker & Lloyd-Walker, 2016) influence the choice of project alliancing as a governance approach. In project network discussions, cognitive embeddedness of the actors is highlighted in establishing a shared vision of the project (Matinheikki et al., 2016) and too little overlap in the expertise and knowledge areas between actors may hinder collaboration (DeFillippi & Sydow, 2016). Even though our analysis did not strongly highlight cultural factors, these may also favor or hinder the choice of project alliancing. For example, cultural barriers (including a lack of trust, misunderstandings, and communication issues) have been shown to be among the most common hindrances to partnering models in general (Mollaoglu et al., 2015).

Overall, our analysis highlights the need for a systematic approach that can enable decision makers to tailor the most suitable delivery arrangement to a project. Project alliancing is one approach to relational project governance and other collaborative project delivery arrangements (such as project partnering or integrated project delivery) (Davies et al., 2019; Kadefors et al., 2024; Lahdenperä, 2012; Nwajei et al., 2022; Walker et al., 2024). These arrangements are more or less interconnected, with slight differences in their governance approaches and the aspects they emphasize. Besides project alliancing, other relational governance structures have been shown to be highly context specific (Brunet & Aubry, 2018; Klakegg et al. 2016; Song et al., 2022; Valkokari et al., 2024; Walker et al., 2024), and room needs to be left to develop the arrangements over time (Benítez-Ávila & Hartmann, 2023; Miller & Hobbs, 2005). This study did not aim to make a comprehensive comparison of these approaches but to highlight the discussion of project alliancing research.

Based on the organized testing workshop, the participants agreed on the identified criteria but did not express a need to prioritize any one of

them. They emphasized that each alliance they have been involved in has been different, and there is no universal model for project alliancing. For example, using project alliancing in hospital construction, where the complexity of the stakeholder environment is emphasized, is very different from more traditional housing construction projects. The owner or customer largely defines the governance approach, making it crucial to involve the actors as early as possible to agree on the project's shared goals. If the customer has already defined the project's goals and specifications in detail before involving other actors, project alliancing might not be the best approach, as others might not be dedicated to these goals, and the goals may not be genuinely shared. They also agreed that in smaller projects, establishing an alliance might be too expensive or labor-intensive. Regarding actor competency, the experts discussed the expertise and readiness of the involved actors to implement project alliancing, noting that the assessment extends to the individual level (i. e., who will be the individuals working in the alliance). They concluded that the available resources and funding dictate what can be achieved with project alliancing. Sometimes, customers might have overly high expectations of what can be achieved, so it is essential to make individual and common goals transparent.

5.2. Alliance governance design matrix

The second research question related to choosing suitable governance mechanisms in project alliancing. Our analysis indicates that many relational governance mechanisms utilized in project alliancing are suitable for various types of IOPs. Building on our analysis, we propose an alliance governance design matrix (Fig. 2) to facilitate the selection of the suitable governance mechanisms for each project, considering specific alliance applicability criteria. We labelled it alliance governance design matrix, to emphasize the necessity of alliance partners to design (i.e., plan and configure) their governance structure to match the requirements of the alliance context. In the matrix, the colors represent each mechanism's degree of relevance to the applicability criteria (white: low relevance; grey: moderate relevance; black: high relevance) presented in Table 1.

The matrix addresses the need to assess the nature of each IOP to choose the most suitable governance mechanisms. The categorization of applicability criteria serves as the basis for carefully assessing which of the 16 governance mechanisms shown in Table 1 could be suitable for a project according to the applicability criteria. Selecting the appropriate mechanisms may increase the effectiveness of the governance and reduce the related costs, thus, contributing to the overall success of the project. The matrix is not intended to establish deterministic or prescriptive relationships. Rather, it aims to illustrate the breadth and frequency of discussions in the literature regarding these connections.

In the heart of the discussion on choosing the governance mechanisms tends to be goal-setting and unanimous decision-making for decreasing uncertainty between the participating organizations. An emphasis on project planning may contribute to the establishment of shared goals and can be beneficial to various IOPs (Tulokas et al., 2024; Winch & Leiringer, 2016). However, involving professional facilitators or consultants may not be realistic in all kinds of projects due to budget, time, and resource constraints (Aaltonen & Turkulainen, 2018). Moreover, establishing a formal alliance organization may not be feasible for smaller projects (DIRD, 2015) as it can be very costly and time-consuming (Aaltonen & Turkulainen, 2022; Hutchinson, 2024) and require extensive tailoring. Nevertheless, some small-scale or more flexible organizational arrangements can be made and when there is trust and established relationships between organizations, the organizational structure can also be planned to be lighter and relying on these relationships (DeFillippi & Sydow, 2016; Walker et al., 2022).

It can be concluded that flexible contracts, open book principles, and mechanisms that promote a cooperative culture can be employed in various kinds of IOPs. Regarding commercial unity, project alliancing requires a contract between partners (Lahdenperä, 2017). However, an

easily accessible contractual basis that can be utilized in different projects is yet to be developed. Open book principles may not be realistic for all kinds of IOPs, but more empirical research is needed to verify this. An incentive scheme or other pain/gain-sharing mechanisms may contribute to the success of many kinds of IOPs by promoting partners' commitment to the established shared goals. A cooperative culture that can be implemented in many—often flexible—ways in IOPs is encouraged. Strong trust-based relationships are sought for in many kinds of projects besides project alliancing (Biesenthal & Wilden, 2014; Galvin et al., 2021; Ruijter et al., 2021) to reduce, for example, opportunistic behaviour. A cooperative culture may support the formation of an alliance by building trust between partners, potentially rendering the use of rigid governance mechanisms unnecessary.

Our analysis acknowledges that many relational governance mechanisms in project alliancing, such as the big room and co-location approaches and workshoping, are resource intensive. Thus, careful consideration is needed to balance the potential advantages and trade-offs of each mechanism in relation to the specific context. Consequently, the attractiveness of project alliancing may be reduced by resource constraints. Furthermore, it may not always be possible to assign the most suitable people (e.g. in terms of a "team player" attitude) to a project (Aaltonen & Turkulainen, 2018; Lahdenperä, 2012). Moreover, involving actors early in a project is not always possible, and careful consideration is needed to determine who to involve and when—for example, in the early design phases. Additionally, some technologies (such as BIM) are not easily scalable due to, for example, high investment costs, high customization needs, and difficulties in integration with existing systems. Using various cooperative technologies and, for example, establishing a virtual big room may increase the attractiveness of project alliancing for various IOPs. However, this depends also on the technological compatibility between organizations and their readiness to utilize various technologies (Whyte, 2019).

The test workshop participants verified the list of identified mechanisms and did not find any particular mechanism missing. They emphasized that the most important mechanism is goal alignment between actors, as it largely dictates how unified the alliance is and whether all actors are dedicated to achieving the goals. Therefore, it is crucial, especially in the design phase, to allocate sufficient time for aligning the goals and to clarify how the achievement of goals will be rewarded. The experts mentioned that managing change across the project life cycle is important and that various workshops are useful for clarifying the goals of the actors and managing various problems that arise in projects. Workshops are often organized and facilitated by the alliance members themselves, with the role of external consultants considered rather minor. More workshops could also be organized during the later phases of the projects, not just at the beginning. This is particularly important for information flow, as there tends to be information shortages when moving from one project phase to another. Regarding the design matrix itself, the experts found it promising but noted that it would require some time to properly fill out. The relevance of each mechanism was considered to vary depending on the project, and the discussion reinforced the vision of this paper that the matrix should be filled out on a case-by-case basis.

6. Conclusions

6.1. Theoretical contributions

This conceptual study contributes to the discussion on the choice of project delivery arrangements (Davies et al., 2019) and relational governance in IOP settings (Song et al., 2022; Valkokari et al., 2024) by assessing the applicability of project alliancing to the governance of differing IOPs. Our study questions previous assumptions by suggesting that project alliancing can be utilized outside traditional alliance project contexts (i.e., megaprojects), thus also showing that project alliancing can be inherently flexible in its nature. We found that few studies have

examined the applicability of the alliance model per se (Lahdenperä, 2012; Lu & Yan, 2007; Walker et al., 2015), with many studies focusing on certain aspects of project alliancing and briefly discussing why the approach was chosen, for example, in an empirical setting. Our conclusion is that, for example, the size of a project is not the sole determinant of whether project alliancing is suitable, given that it has been employed in projects of various sizes (Fernandes et al., 2018; Hutchinson, 2024) and types (such as IT projects; Lappi et al., 2019). The choice depends on various criteria and their interconnectedness and needs to be assessed on a case-by-case basis.

The aim of this paper was not to introduce new relational governance mechanisms, but rather to integrate contextual factors (i.e., alliance applicability criteria) with commonly discussed governance mechanisms in project alliancing studies. Project (Ahola et al., 2014; Derakhshan et al., 2019; Guo et al., 2014) and project network governance (Adami & Verschoore, 2018; Braun, 2018; DeFillippi & Sydow, 2016; Kujala et al., 2021; Matinheikki et al., 2016) discussions have offered extensive analysis of various governance mechanisms in IOPs. In line with, for example, Kujala et al. (2021), we argue that alliance governance is inherently dependent on the participating actors' choices and how they design the governance structure to achieve the project's planned goals. With this in mind, the proposed alliance design matrix may serve as a useful tool for decision-makers in IOPs to develop customized governance structures tailored to the specific needs of each individual project. Our study also highlights the need to assess the suitability of governance mechanisms for specific factors (e.g., uncertainties) and governance needs (Nikulina et al., 2022; Roehrich et al., 2023; Song et al., 2022; Valkokari et al., 2024).

Altogether, the contribution of this study to the project governance discussions is to highlight project alliancing to be seen as a collection of activities for governance rather than a rigid contractual issue. This in turn encourages employing project alliancing more widely across various IOPs as project alliancing governance structures can be tailored to the specific needs of the project. Particularly for future research, this study identifies potential gaps (as indicated by blanks in Table 1 and the proposed matrix) in the understanding of project alliancing applicability and the roles of related governance mechanisms in mitigating uncertainties and complexities in such projects. For instance, our analysis highlights that the roles of external actors (such as consultants) and alliance contracts in fostering innovation and innovative practices within project alliancing remain understudied in addition to a need for further investigation into project alliancing across projects of varying sizes.

6.2. Practical implications

The alliance governance design matrix developed in this study serves two practical functions. First, it supports decision makers in determining whether a specific project should be implemented using the project alliancing approach. Project alliance was earlier defined as a contract type where key project actors commit to delivering the expected project outcome jointly and agree to share the risks and benefits of the entire project. The matrix uses six alliance applicability criteria to guide this decision. If several or all of these criteria can be characterized as "high," the alliance form should be chosen. Conversely, if several or all criteria can be characterized as "low," the alliance form should not be chosen.

Second, the matrix offers guidance to managers on which specific governance mechanisms could be useful in the focal project. Tailoring these mechanisms is crucial due to the significant costs and administrative complexity associated with their implementation. For example, agreeing on a shared vision and culture for the project (mechanism 2) is likely to require organizing multiple meetings or workshops, demanding the commitment of key personnel for several working days. While, according to our analysis, it is justified to utilize most (if not all) of the sixteen governance mechanisms in large and complex projects characterized by complex stakeholder environments, high risks, and a high

need for innovativeness, smaller projects with less complexity and risk may be governed with only a handful of mechanisms selected from the sixteen available. Therefore, the optimal approach in most situations is not necessarily to maximize the number of governance mechanisms applied. This aligns with Fernandes et al. (2018), who, in their analysis of an apartment renovation project, do not highlight evidence of using governance mechanisms such as the big room approach or external alliance consultants. The matrix presented in this study provides guidance for this selection by highlighting connections between specific alliance applicability criteria (such as stakeholder network complexity) and specific governance mechanisms (such as using open book principles in cost reporting).

Finally, as organizations and individual decision-makers tend to repeat successful patterns of action until evidence of failure, the alliance design matrix supports decision-makers in learning to utilize the alliance form more effectively in subsequent projects as it facilitates the critical evaluation of dyadic relationships between individual alliance applicability criteria and specific governance mechanisms. As such, the matrix can be used to highlight the main differences between the current project and past projects, indicating where adjustments in governance may be required.

6.3. Limitations and avenues for future research

Being conceptual in nature, this study does not draw on empirical data. Moreover, we made certain choices to focus the analysis on six applicability criteria. Some studies may feature additional criteria (such as cultural factors) that deserve more attention. Furthermore, we focused on relational governance mechanisms, but certain more formal and contractual related mechanisms are also needed in project alliancing. Relational and contractual mechanisms have been shown to be complementary rather than mutually exclusive (Cao & Lumineau, 2015; Eriksson et al., 2023; Nikulina et al., 2022). Thus, our analysis could be expanded to analysing the complementarity of various mechanisms when forming the governance structure in various IOPs.

Future research is encouraged to empirically test the validity of our framework and provide further empirical support for the applicability of the alliance model to diverse IOPs. For example, fuzzy-set qualitative comparative analysis (fsQCA) techniques could be utilized to empirically validate our findings, thus, continuing our testing with the experts. Moreover, further systematic analysis of the relationships between individual governance mechanisms and applicability criteria is needed. Unexplored areas include the use of incentive schemes in smaller IOPs, the cost-efficient utilization of organizational arrangements such as alliance boards of directors, and the evolution of governance mechanisms throughout a project's life cycle. We did not focus on project life cycle to avoid an overexpansion of our analysis, thus, the analysis could be expanded to dynamic aspects of governance and in multi-project settings. Future longitudinal studies could investigate how vision, goals, and culture can be maintained across all phases of a project. Moreover, our findings indicate a scarcity of empirical studies on how project alliancing and related governance mechanisms can support innovation and innovative practices. Future research could also investigate how various technologies (such as AI tools) may encourage or discourage project alliancing in various contexts.

CRedit authorship contribution statement

Matias Stähle: Writing – original draft, Visualization, Methodology, Formal analysis, Conceptualization. **Tuomas Ahola:** Writing – original draft, Visualization, Validation, Funding acquisition. **Miia Martinsuo:** Writing – original draft, Visualization, Validation, Conceptualization.

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References

- Aaltonen, K., & Turkulainen, V. (2018). Creating relational capital through socialization in project alliances. *International Journal of Operations & Production Management*, 38(6), 1387–1421.
- Aaltonen, K., & Turkulainen, V. (2022). Institutionalization of a collaborative governance model to deliver large, inter-organizational projects. *International Journal of Operations & Production Management*, 42(8), 1294–1328.
- Adami, V. S., & Verschoore, J. R. (2018). Implications of network relations for the governance of complex projects. *Project management journal*, 49(2), 71–88.
- Ahola, T. (2018). So alike yet so different: A typology of interorganisational projects. *International Journal of Project Management*, 36(8), 1007–1018.
- Ahola, T., Ruuska, I., Artto, K., & Kujala, J. (2014). What is project governance and what are its origins? *International Journal of Project Management*, 32(8), 1321–1332.
- Benítez-Ávila, C., & Hartmann, A. (2023). Managerial agency (re)producing project governance structure and context: Public-private partnerships in The Netherlands. *International Journal of Project Management*, 41(4), Article 102468.
- Benítez-Ávila, C., Hartmann, A., Dewulf, G., & Henseler, J. (2018). Interplay of relational and contractual governance in public-private partnerships: The mediating role of relational norms, trust and partners' contribution. *International Journal of Project Management*, 36(3), 429–443.
- Biesenthal, C., & Wilden, R. (2014). Multi-level project governance: Trends and opportunities. *International Journal of Project Management*, 32(8), 1291–1308.
- Brady, T., Davies, A., Gann, D., & Rush, H. (2007). Learning to manage mega projects: The case of BAA and Heathrow Terminal 5. *Project Perspectives*, 29, 32–39.
- Bresnen, M., & Marshall, N. (2000). Motivation, commitment and the use of incentives in partnerships and alliances. *Construction Management and Economics*, 18(5), 587–598.
- Brookes, N., Sage, D., Dainty, A., Locatelli, G., & Whyte, J. (2017). An island of constancy in a sea of change: Rethinking project temporalities with long-term megaprojects. *International Journal of Project Management*, 35(7), 1213–1224.
- Brunet, M., & Aubry, M. (2018). The governance of major public infrastructure projects: The process of translation. *International Journal of Managing Projects in Business*, 11(1), 80–103.
- Bygballé, L. E., & Swärd, A. (2019). Collaborative project delivery models and the role of routines in institutionalizing partnering. *Project Management Journal*, 50(2), 161–176.
- Callahan, J. L. (2010). Constructing a manuscript: Distinguishing integrative literature reviews and conceptual and theory articles. *Human Resource Development Review*, 9(3), 300–304.
- Cao, Z., & Lumineau, F. (2015). Revisiting the interplay between contractual and relational governance: A qualitative and meta-analytic investigation. *Journal of Operations Management*, 33, 15–42.
- Che Ibrahim, C. K. I., Costello, S. B., Wilkinson, S., & Walker, D. (2017). Innovation in alliancing for improved delivery of road infrastructure projects. *International Journal of Managing Projects in Business*, 10(4), 700–720.
- Chen, G., Zhang, G., Xie, Y.-M., & Jin, X.-H. (2012). Overview of alliancing research and practice in the construction industry. *Architectural Engineering and Design Management*, 8(2), 103–119.
- Chen, L., & Manley, K. (2014). Validation of an instrument to measure governance and performance on collaborative infrastructure projects. *Journal of Construction Engineering and Management*, 140(5), Article 04014006.
- Clegg, S. R., Pitsis, T. S., Rura-Polley, T., & Marosszeky, M. (2002). Governmentality matters: Designing an alliance culture of inter-organizational collaboration for managing projects. *Organization Studies*, 23(3), 317–337.
- Davies, A., Gann, D., & Douglas, T. (2009). Innovation in megaprojects: Systems integration at London Heathrow Terminal 5. *California Management Review*, 51(2), 101–125.
- Davies, A., MacAulay, S. C., & Brady, T. (2019). Delivery model innovation: Insights from infrastructure projects. *Project Management Journal*, 50(2), 119–127.
- DeFillippi, R., & Sydow, J. (2016). Project networks: Governance choices and paradoxical tensions. *Project management journal*, 47(5), 6–17.
- Department of Infrastructure and Regional Development. (2015). *National alliance contracting guidelines – A guide to alliance contracting*. Australian Government. Available: https://www.infrastructure.gov.au/sites/default/files/migrated/infrastructure/ngpd/files/National_Guide_to_Alliance_Contracting.pdf.
- Derakhshan, R., Turner, R., & Mancini, M. (2019). Project governance and stakeholders: A literature review. *International Journal of Project Management*, 37(1), 98–116.
- Di Maddaloni, F., & Sabini, L. (2022). Very important, yet very neglected: Where do local communities stand when examining social sustainability in major construction projects? *International Journal of Project Management*, 40(7), 778–797.
- Elsbach, K., & van Knippenberg, D. (2020). Creating high-impact literature reviews: An argument for 'integrative reviews'. *Journal of Management Studies*, 57(6), 1277–1289.
- Engelbø, A., Lædre, O., Young, B., Larssen, P. F., Lohne, J., & Klakegg, O. J. (2020). Collaborative project delivery methods: A scoping review. *Journal of Civil Engineering and Management*, 26(3), 278–303.
- Engwall, M. (2003). No project is an island: Linking projects to history and context. *Research Policy*, 32(5), 789–808.
- Eriksson, P. E., Pesämaa, O., & Larsson, J. (2023). Governing technical and organizational complexity through supply chain integration: A dyadic perspective on performance in infrastructure projects. *International Journal of Project Management*, 41(4), Article 102479.
- Fernandes, D. A., Costa, A. A., & Lahdenperä, P. (2018). Key features of a project alliance and their impact on the success of an apartment renovation: A case study. *International Journal of Construction Management*, 18(6), 482–496.
- Flyvbjerg, B. (2014). What you should know about megaprojects and why: An overview. *Project Management Journal*, 45(2), 6–19.
- Galvin, P., Tywoniak, S., & Sutherland, J. (2021). Collaboration and opportunism in megaproject alliance contracts: The interplay between governance, trust and culture. *International Journal of Project Management*, 39(4), 394–405.
- Gil, N. (2009). Developing cooperative project client-supplier relationships: How much to expect from relational contracts? *California management review*, 51(2), 144–169.
- Gulati, R., Lawrence, P. R., & Puranam, P. (2005). Adaptation in vertical relationships: Beyond incentive conflict. *Strategic management journal*, 26(5), 415–440.
- Guo, F., Chang-Richards, Y., Wilkinson, S., & Li, T. C. (2014). Effects of project governance structures on the management of risks in major infrastructure projects: A comparative analysis. *International Journal of Project Management*, 32(5), 815–826.
- Hellgren, B., & Stjernberg, T. (1995). Design and implementation in major investments—A project network approach. *Scandinavian journal of management*, 11(4), 377–394.
- Hietajärvi, A. M., & Aaltonen, K. (2018). The formation of a collaborative project identity in an infrastructure alliance project. *Construction Management and Economics*, 36(1), 1–21.
- Hietajärvi, A. M., Aaltonen, K., & Haapasalo, H. (2017). What is project alliance capability? *International Journal of Managing Projects in Business*, 10(2), 404–422.
- Hutchinson, L. (2024). *Alliance contracting in health and social care: A practical guide to commissioning for collaboration*. Oxford, UNITED KINGDOM: Taylor & Francis Group.
- Jaakkola, E. (2020). *Designing conceptual articles: Four approaches*, 10 pp. 18–26). AMS Review.
- Jefferies, M., John Brewer, G., & Gajendran, T. (2014). Using a case study approach to identify critical success factors for alliance contracting. *Engineering, Construction and Architectural Management*, 21(5), 465–480.
- Jones, C., Hesterly, W. S., & Borgatti, S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of management review*, 22(4), 911–945.
- Jones, C., & Lichtenstein, B. B. (2008). Temporary inter-organizational projects: How temporal and social embeddedness enhance coordination and manage uncertainty. In S. Cropper, M. Ebers, C. Huxham, & P. S. Ring (Eds.), *The Oxford handbook of inter-organizational relations* (pp. 231–255). Oxford, England: Oxford University Press.
- Kadefors, A., Aaltonen, K., Gottlieb, S. C., Klakegg, O. J., Lahdenperä, P., Olsson, N. O., Rosander, L., & Thuesen, C. (2024). Relational contracting in Nordic construction – A comparative longitudinal account of institutional field developments. *International Journal of Managing Projects in Business*, 17(8), 22–46.
- Kier, C., Aaltonen, K., Whyte, J., & Huemann, M. (2023). How projects co-create value with stakeholders: The role of ideology and inquiry in spanning the temporary-permanent boundary. *International Journal of Project Management*, 41(5), Article 102482.
- Kivilä, J., Martinsuo, M., & Vuorinen, L. (2017). Sustainable project management through project control in infrastructure projects. *International Journal of Project Management*, 35(6), 1167–1183.
- Klakegg, O. J., Williams, T., & Shiferaw, A. T. (2016). Taming the “trolls”: Major public projects in the making. *International Journal of Project Management*, 34(2), 282–296.
- Kujala, J., Aaltonen, K., Gotcheva, N., & Lahdenperä, P. (2021). Dimensions of governance in interorganizational project networks. *International Journal of Managing Projects in Business*, 14(3), 625–651.
- Lahdenperä, P. (2012). Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery. *Construction Management and Economics*, 30(1), 57–79.
- Lahdenperä, P. (2017). Towards a coherent theory of project alliancing: Discovering the system's complex mechanisms yielding value for money. *Construction Economics and Building*, 17(2), 41–61.
- Langfield-Smith, K. (2008). The relations between transactional characteristics, trust and risk in the start-up phase of a collaborative alliance. *Management Accounting Research*, 19(4), 344–364.
- Lappi, T. M., Aaltonen, K., & Kujala, J. (2019). The birth of an ICT project alliance. *International Journal of Managing Projects in Business*, 12(2), 325–355.
- Ligthart, R., Oerlemans, L., & Noorderhaven, N. (2016). In the shadows of time: A case study of flexibility behaviors in an interorganizational project. *Organization Studies*, 37(12), 1721–1743.
- Lloyd-Walker, B. M., Mills, A. J., & Walker, D. H. (2014). Enabling construction innovation: The role of a no-blame culture as a collaboration behavioural driver in project alliances. *Construction management and economics*, 32(3), 229–245.
- Love, P. E., Davis, P. R., Chevis, R., & Edwards, D. J. (2011). Risk/reward compensation model for civil engineering infrastructure alliance projects. *Journal of Construction Engineering and Management*, 137(2), 127–136.
- Love, P. E., Mistry, D., & Davis, P. R. (2010). Price competitive alliance projects: Identification of success factors for public clients. *Journal of Construction Engineering and Management*, 136(9), 947–956.
- Love, P. E., Teo, P., Davidson, M., Cumming, S., & Morrison, J. (2016). Building absorptive capacity in an alliance: Process improvement through lessons learned. *International Journal of Project Management*, 34(7), 1123–1137.

- Lu, S., & Yan, H. (2007). A model for evaluating the applicability of partnering in construction. *International Journal of Project Management*, 25(2), 164–170.
- Ma, H., Zeng, S., Lin, H., Chen, H., & Shi, J. J. (2017). The societal governance of megaproject social responsibility. *International Journal of Project Management*, 35(7), 1365–1377.
- Macneil, I. R. (1977). Contracts: Adjustment of long-term economic relations under classical, neoclassical, and relational contract law. *Northwestern University Law Review*, 72(6), 854.
- Manning, S. (2008). Embedding projects in multiple contexts—a structuration perspective. *International journal of project management*, 26(1), 30–37.
- Martinsuo, M. (2023). Portfolio and program governance. In R. Müller, S. Sankaran, & N. Drouin (Eds.), *Research handbook on the governance of projects* (pp. 308–317). Edward Elgar.
- Matinheikki, J., Aaltonen, K., & Walker, D. (2019). Politics, public servants, and profits: Institutional complexity and temporary hybridization in a public infrastructure alliance project. *International Journal of Project Management*, 37(2), 298–317.
- Matinheikki, J., Artto, K., Peltokorpi, A., & Rajala, R. (2016). Managing inter-organizational networks for value creation in the front-end of projects. *International journal of project management*, 34(7), 1226–1241.
- Miller, R., & Hobbs, B. (2005). Governance regimes for large complex projects. *Project Management Journal*, 36(3), 42–50.
- Mollaoglu, S., Sparkling, A., & Thomas, S. (2015). An inquiry to move an underutilized best practice forward: Barriers to partnering in the architecture, engineering, and construction industry. *Project Management Journal*, 46(1), 69–83.
- Müller, R., Zhai, L., & Wang, A. (2017). Governance and governmentality in projects: Profiles and relationships with success. *International Journal of Project Management*, 35(3), 378–392.
- Nikulina, A., Volker, L., & Bosch-Rekveltd, M. (2022). The interplay of formal integrative mechanisms and relational norms in project collaboration. *International Journal of Project Management*, 40(7), 798–812.
- Nwajei, U. O. K., Bolviken, T., & Hellström, M. M. (2022). Overcoming the principal-agent problem: The need for alignment of tools and methods in collaborative project delivery. *International Journal of Project Management*, 40(7), 750–762.
- Nyameke, E., & Haapasalo, H. (2022). Identity formation and maintenance in a large hospital construction project. *Project Leadership and Society*, 3, Article 100058.
- Pargar, F., Kujala, J., Aaltonen, K., & Ruutu, S. (2019). Value creation dynamics in a project alliance. *International Journal of Project Management*, 37(5), 716–730.
- Plantinga, H., & Dorée, A. (2016). Procurement strategy formation: (Re-)designing rail infrastructure project alliances. *International Journal of Managing Projects in Business*, 9(1), 53–73.
- Poirier, E., Forgues, D., & Staub-French, S. (2016). Collaboration through innovation: Implications for expertise in the AEC sector. *Construction management and economics*, 34(11), 769–789.
- Rahman, M. M., & Kumaraswamy, M. M. (2002). Joint risk management through transactionally efficient relational contracting. *Construction Management & Economics*, 20(1), 45–54.
- Roehrich, J. K., Davies, A., Tyler, B. B., Mishra, A., & Bendoly, E. (2023). Large interorganizational projects (LIPs): Toward an integrative perspective and research agenda on interorganizational governance. *Journal of Operations Management*, 70(1), 4–21.
- Romme, A. G. L., & Holmström, J. (2023). From theories to tools: Calling for research on technological innovation informed by design science. *Technovation*, 121, Article 102692.
- Ruijter, H., van Marrewijk, A., Veenswijk, M., & Merkus, S. (2021). Filling the mattress: Trust development in the governance of infrastructure megaprojects. *International Journal of Project Management*, 39(4), 351–364.
- Ruuska, I., Ahola, T., Artto, K., Locatelli, G., & Mancini, M. (2011). A new governance approach for multi-firm projects: Lessons from Olkiluoto 3 and Flamanville 3 nuclear power plant projects. *International Journal of Project Management*, 29(6), 647–660.
- Sakal, M. W. (2005). Project alliancing: A relational contracting mechanism for dynamic projects. *Lean Construction Journal*, 2(1), 67–79.
- Sanderson, M., Allen, P., Gill, R., & Garnett, E. (2018). New models of contracting in the public sector: A review of alliance contracting, prime contracting and outcome-based contracting literature. *Social Policy & Administration*, 52(5), 1060–1083.
- Shenhar, A. J. (2001). One size does not fit all projects: Exploring classical contingency domains. *Management Science*, 47, 394–414.
- Song, J., Song, L., Liu, H., Feng, Z., & Müller, R. (2022). Rethinking project governance: Incorporating contextual and practice-based views. *International Journal of Project Management*, 40(4), 332–346.
- Steen, J., DeFillippi, R., Sydow, J., Pryke, S., & Michelfelder, I. (2018). Projects and networks: Understanding resource flows and governance of temporary organizations with quantitative and qualitative research methods. *Project management journal*, 49(2), 3–17.
- Stjerne, I. S., & Svejenova, S. (2016). Connecting temporary and permanent organizing: Tensions and boundary work in sequential film projects. *Organization Studies*, 37(12), 1771–1792.
- Suprpto, M., Bakker, H. L., Mooi, H. G., & Hertogh, M. J. (2016). How do contract types and incentives matter to project performance? *International Journal of Project Management*, 34(6), 1071–1087.
- Sydow, J., & Braun, T. (2018). Projects as temporary organizations: An agenda for further theorizing the interorganizational dimension. *International Journal of Project Management*, 36(1), 4–11.
- Tulokas, M., Haapasalo, H., & Tampio, K. P. (2024). Formation and maintenance of organizational culture in collaborative hospital construction projects. *Project Leadership and Society*, 5, Article 100125.
- Turner, J. R., & Simister, S. J. (2001). Project contract management and a theory of organization. *International journal of project management*, 19(8), 457–464.
- Vaez-Alaei, M., Deniaud, I., Marmier, F., Gourc, D., & Cowan, R. (2022). A partner selection framework for strategic alliances based on project complexity and partner's past experience. *Enterprise Information Systems*, 16(6), Article 1889038.
- Valkokari, K., Paasi, J., Nysten-Haarala, S., Nuottila, J., & Hurmerinta-Haanpää, A. (2024). Governance mechanisms and practices in project-based interorganizational collaboration for innovation. *International Journal of Project Management*, 42(8), Article 102652.
- Vilasini, N., Neitzert, T., & Rotimi, J. (2014). Developing and evaluating a framework for process improvement in an alliance project: A New Zealand case study. *Construction Management and Economics*, 32(6), 625–640.
- Walker, D. H., & Lloyd-Walker, B. M. (2016). Understanding the motivation and context for alliancing in the Australian construction industry. *International Journal of Managing Projects in Business*, 9(1), 74–93.
- Walker, D. H., Love, P. E., & Betts, M. (2024). *Strategic integrated program delivery: Learning from the level crossing removal project*. Taylor & Francis.
- Walker, D. H., Love, P. E., & Betts, M. (2024b). LXP Project-Program Integration. *Strategic integrated program delivery* (pp. 74–90). Routledge.
- Walker, D. H., Love, P. E., Betts, M., & Jacobsson, M. (2024a). LXP delivery choices. *Strategic integrated program delivery* (pp. 53–73). Routledge.
- Walker, D. H., Vaz Serra, P., & Love, P. E. (2022). Improved reliability in planning large-scale infrastructure project delivery through Alliancing. *International Journal of Managing Projects in Business*, 15(5), 721–741.
- Walker, D. H. T., Harley, J., & Mills, A. (2015). Performance of project alliancing in Australasia: A digest of infrastructure development from 2008 to 2013. *Construction Economics and Building*, 15(1), 1–18.
- Whyte, J. (2019). How digital information transforms project delivery models. *Project Management Journal*, 50(2), 177–194.
- Williams, T., Klakegg, O. J., Magnussen, O. M., & Glasspool, H. (2010). An investigation of governance frameworks for public projects in Norway and the UK. *International Journal of Project Management*, 28(1), 40–50.
- Winch, G. (2006). The governance of project coalitions — Towards a research agenda. In D. Lowe, & R. Leiringer (Eds.), *The commercial management of projects: Defining the discipline* (pp. 324–343). Wiley.
- Winch, G., & Leiringer, R. (2016). Owner project capabilities for infrastructure development: A review and development of the “strong owner” concept. *International Journal of Project Management*, 34(2), 271–281.
- Yeung, J. F., Chan, A. P., & Chan, D. W. (2007). The definition of alliancing in construction as a Wittgenstein family-resemblance concept. *International Journal of Project Management*, 25(3), 219–231.
- Zwikaal, O., & Smyrk, J. (2015). Project governance: Balancing control and trust in dealing with risk. *International Journal of Project Management*, 33(4), 852–862.