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A clash of clans: an empirical study of conflicting institutional logics and their impact on megaproject collaboration

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Abstract

Purpose – Managing megaprojects is challenging due to their inherent complexity and uncertainty. Collaborative project delivery models have been introduced as an alternative to traditional project management in public infrastructure megaprojects and are often realized through collaborative contracts. These project organizations act as institutional arenas for logic interaction as actors with differing institutional backgrounds interact within the project. This paper aims to study the delivery phase of three megaprojects through an institutional lens, investigating the institutional interaction and alignment of logics therein.

Design/methodology/approach – A multiple case study was employed to reach deep insight into the phenomenon. Sixty-one interviews were conducted over 3 cases with representatives from all levels of the project hierarchy. Respondents were selected through snowball sampling. In two cases, observations of the shared project office were conducted. Data analysis built on first-order codes and second-order themes, collected into a theoretical framework.

Findings – The empirical evidence demonstrates the dynamics shaping institutional logics and gives evidence for changing logics in projects with a well-applied collaborative contract. However, there is a risk of resistance and a return to traditional logics since institutional change is slow and an unsuitably applied collaborative contract can lead to adherence to the conventional way of work.

Originality/value – Current research has focused on the regulatory framework and procurement phase of such models, but little attention has been given to the delivery phase and the interaction of conflicting logics. This paper can serve as an exemplar of the different logics found within public infrastructure projects and their interaction and alignment. Contributions include a heightened emphasis on the start of the project as a meeting point for differing institutional logics and the role change necessary when using a collaborative contract.

Keywords Construction management, Construction megaprojects, Inter-institutional project, Inter-organizational projects, Institutional logics, Megaprojects, Project delivery methods, Project management

Paper type Research paper

Introduction

The conflict of institutional logics inherent in megaprojects constitutes a major challenge for their successful delivery. These inter-organizational and society-impacting major

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undertakings involving multiple organizations working in collaboration are created to answer to the arduous requirements of meeting complex, large-scale goals that no single actor can shoulder alone (Denicol *et al.*, 2020; Flyvbjerg, 2014; Jones and Lichtenstein, 2008). Due to their role in societal transformation, economy and achieving public goals, megaprojects are particularly pertinent for Sustainable Development Goals 8, 9, 11 and 12. Their number and size have grown over the past decades (Flyvbjerg, 2014), as has the amount of research into them (Denicol *et al.*, 2020). As megaprojects grow in size and scope, they are increasingly seen as programmes of sub-projects, managed by a central organization rather than as singular projects (Denicol *et al.*, 2021; Frederiksen *et al.*, 2021). This apparent shift in focus emphasizes the importance of intra- and inter-organizational collaboration and coordination: a key characteristic of megaprojects (Denicol *et al.*, 2021; Jones and Lichtenstein, 2008), which rests on common language and a shared understanding of expected roles and behaviours (Jones and Lichtenstein, 2008). However, the multitude of participating actors and stakeholders all come from separate institutional backgrounds and are thus approaching the project from different viewpoints, challenging this important key characteristic.

Megaprojects are especially prevalent in infrastructure delivery, a field characterized by long-term and complex projects (Qiu *et al.*, 2019) and global yearly spending needs in the trillions of US dollars (Flyvbjerg, 2014). Moreover, infrastructure delivery projects, such as the development of transport infrastructure, often have a society-wide impact (Matinheikki *et al.*, 2019; Walker *et al.*, 2015). In an effort to manage the inter-organizational interfaces characteristic of megaprojects, collaborative project delivery models (CPDM) have been introduced in infrastructure delivery (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015). Such models are often gathered under the heading of "collaborative contracts" and include alliancing (Matinheikki *et al.*, 2019; Walker *et al.*, 2015), early contractor involvement (Eadie and Graham, 2014), integrated project delivery (Hall and Scott, 2019) and partnering (Bygballe and Swärd, 2019), all characterized by early inclusion of key actors and shared project space, both physical and processual (Lahdenperä, 2012).

When introducing new project delivery models, established processes and roles in the field change (Walker and Lloyd-Walker, 2015), transforming the institutional context and leading to shifting patterns of organizational and individual behaviour (Biesenthal *et al.*, 2018; Meyer and Rowan, 1977). What was acceptable no longer works and the prevailing institutional logic, or shared understanding and expectation of the institution (Thornton *et al.*, 2012), shifts. This institutional shift is, however, little understood (Biesenthal *et al.*, 2018), especially in the context of megaprojects which impact their context by their mere existence (Söderlund and Sydow, 2019), encompass a multitude of different logics (Biesenthal *et al.*, 2018; Qiu *et al.*, 2019), and whose formation and delivery thus can be viewed as challenging current institutions. This has both theoretical and practical implications. From a theoretical perspective, a more complete understanding of how actors approach conflicting logics could help us understand how institutional change occurs in and through projects. From a practical perspective, a more comprehensive understanding of these new collaborative contract models can support organizations in navigating the field of CPDM. Moreover, understanding how project actors navigate conflicting logics can help design better organizations and practices to mitigate the pitfalls thereof, thus improving project delivery.

Recent studies in the field have investigated governance models (Denicol *et al.*, 2021), the role of formal and informal relationships (Matinheikki *et al.*, 2019) and institutional complexity (Qiu *et al.*, 2019) in megaprojects. The delivery of megaprojects has received less focus, although much of the tension of conflicting institutional logics is evident only in this stage of the project. There have consequently been calls for more insight into organizing and managing megaprojects (Söderlund *et al.*, 2017) and empirical studies of how megaproject actors navigate conflicting institutional logics that arise in inter-organizational and -institutional contexts (Biesenthal *et al.*, 2018). The aim of this paper is to answer this call

for further empirical studies and thus add to the field of institutional theory by investigating conflicting logics in a megaproject, as well as contribute to the practical aspects of megaproject management by clarifying how collaborative contracts are used with respect to institutional logics. The following research question was developed to meet this aim:

RQ1. How are collaborative contracts used to mitigate conflicting institutional logics in megaproject organizations?

The research method is a multiple case study of three infrastructure delivery projects utilizing collaborative contracts. By focusing on a specific contract model, this research furthermore provides a greater understanding of the role collaborative contracts play in resolving conflicts between institutional logics as encouraged by Matinheikki *et al.* (2019).

The paper is structured as follows. The second section gives an overview of the theoretical framework of institutional theory and institutional logics. In the third section, I present data collection and analysis. The fourth section elaborates on findings, after which they are discussed in relation to the theoretical framework in the fifth section. Finally, I offer conclusions, contributions and avenues for future research.

Theoretical background

Institutions in infrastructure delivery megaprojects

The institutional context guides project actors' actions through individuals' negotiations, organizations' coordination and institutions' framing (Thornton *et al.*, 2012), easing social interaction due to the heuristics they comprise which in turn aligns people's actions and their perception of their context (Kadefors, 1995; Meyer and Rowan, 1977). Established concepts and expectations facilitate in predicting behaviour (Kadefors, 1995; Powell and Oberg, 2018; Söderlund and Sydow, 2019) and reduce the need for information processing and aligning conduct (Zheng *et al.*, 2021). Institutions can thus be described as the products of social interaction (Meyer and Rowan, 1977; Scott, 2014), where regulations, norms and culture rely on and inform expected behaviours and reactions (Powell and Oberg, 2018).

Megaprojects are, however, unique institutional contexts due to a lack of formal bureaucratic power (Matinheikki *et al.*, 2019), their transient, yet permanent, nature (Jones and Lichtenstein, 2008; Söderlund and Sydow, 2019; Sydow and Braun, 2018), the need to temporarily align multiple stakeholders (Biesenthal *et al.*, 2018; Jones and Lichtenstein, 2008) and their impact on society (Flyvbjerg, 2014). In the absence of formal bureaucratic power – and as faithful adherence to institutional procedures restricts actor's actions (Meyer and Rowan, 1977) – social acceptance and shared understanding become more important (Matinheikki *et al.*, 2019), increasing the importance of relational governance, the impact of which grows due to temporal restriction and the need for project-wide alignment. These temporal, relational ties provide a mechanism to manage uncertainty in projects (Jones and Lichtenstein, 2008; Qiu *et al.*, 2019) – although the multitude of stakeholders involved all but guarantees conflict of institutional logics. Quoting Qiu *et al.* (2019), "in the context of megaprojects, institutional complexity comes from the institutional differences among actors, groups, political regimes, and the macro-environments that can bring about conflicts and uncertainty" (p. 427).

Institutions thus influence megaproject delivery (Biesenthal *et al.*, 2018; Matinheikki *et al.*, 2019; Söderlund and Sydow, 2019) and megaprojects can therefore be defined by the contradictory social context they are situated in, their existence and delivery dependent on dreams and wishes of those who fund and found them (Biesenthal *et al.*, 2018). Since institutions, projects and their social context are in constant interaction, studying this interplay and understanding the social context of projects can help contribute to broader theoretical fields (Glynn and D'aunno, 2023; Söderlund and Sydow, 2019).

With the conflicting institutional logics as our focus, the temporal nature of projects (Söderlund and Sydow, 2019) may further illuminate the conflict as well as the establishment of new norms and behaviours. Taking a perspective based on institutional logics helps us focus on the social aspects of the project, with the project becoming a stage on which institutional tensions play out.

An especially interesting empirical setting for research into conflicting institutional logics is the infrastructure delivery industry in general and the construction field in particular. This context combines project-based organizations (Eccles, 1981; Söderlund and Sydow, 2019) with megaprojects (Biesenthal *et al.*, 2018; Zheng *et al.*, 2021) and recently the novel delivery model CPDM (Bygballe and Swärd, 2019; Kadefors *et al.*, 2023) and its operationalization through collaborative contracts.

Infrastructure projects are generally complex (Qiu *et al.*, 2019), involve several stakeholders (Biesenthal *et al.*, 2018), impact their environment noticeably and are often managed by inexperienced actors (Eriksson, 2015). To classify as megaprojects, they should furthermore span many years or even decades, have a significant economic impact and be societally transformational (Flyvbjerg, 2014). Infrastructure delivery projects are moreover often public undertakings due to their size and impact on their environment and society (ibid.). Public agencies involved in infrastructure projects shape the context in which the projects are delivered (Biesenthal *et al.*, 2018). Moreover, infrastructure delivery projects in general – and megaprojects in particular – can be viewed as quasi-stable organizations due to their long lifespan (Eriksson, 2015; Flyvbjerg, 2014), moving them somewhat from a purely temporary project-based context towards permanence.

Actor roles

Construction projects are based on the relationships between three main actors: the client, the contractor and the design engineering consultant (Eccles, 1981; Hughes and Murdoch, 2003; Kadefors, 1995), none of which have complete control over the project as a whole (Kadefors, 1995) but must still be coordinated (Eccles, 1981).

The client establishes the project (Denicol *et al.*, 2021; Hughes and Murdoch, 2003). Recent research has clarified between different roles in this aspect, delineating between owner, sponsor and client (Denicol *et al.*, 2021). The term "client" was chosen in this paper due to the focus on the temporal project setting over alternatives such as "owner" or "sponsor". The client role comprises representative functions, such as client project manager and site agent, but can also include advisor and third-party representatives (Hughes and Murdoch, 2003).

The contractor is responsible for delivering the finished works as the builder. Their role includes managing and executing the delivery process. The delivery process is often divided into sub-contracted parts, necessitating contract management and organizational planning which often creates long-lasting relationships with the contractor's sub-contractors (Eccles, 1981).

The design engineer is often a sub-contracted service provider. The role includes leading the design works as for example the architect or design lead, as well as administrative tasks such as planning supervisor and ensuring quality by for example acting as site inspector (Hughes and Murdoch, 2003). Since this paper will not focus on pre-project stages, pre-project advisory roles the design engineers can be engaged in have been omitted.

Successful delivery of the project needs the input of several project roles, depending on the delivery model chosen. Project roles are here defined as the relationship between a project actor and a project activity, with corresponding responsibilities. The project manager is for example responsible for managing the whole project, while the design manager is responsible for co-ordinating the design process and the construction manager organizes delivery. There might be centralized support functions, such as cost planning and human resource

coordination as well as supply chain management (Hughes and Murdoch, 2003). Megaprojects moreover often have a *leadership team*, comprised of representatives from all participating organizations (Walker *et al.*, 2015). Collaborative contracts introduce new roles and processes and thus a need for new divisions of responsibilities and duties in the project organization.

Project routines and behaviours

Routines are collectively negotiated and recognized patterns of interdependent actions and in projects utilizing a collaborative contract, the conscious establishment thereof can help in creating a mutual understanding of the project (Bygballe and Swärd, 2019). Behaviours are the actions participants take and reactions they have according to internal and external stimuli, among which especially communication is important in a megaproject setting (Zheng *et al.*, 2021).

In conventional infrastructure delivery projects, *the client* will shape the project during procurement and early project stages (Denicol *et al.*, 2021; Järvenpää *et al.*, 2022; Kadefors, 1995) before taking a more distant role during delivery. Traditionally their routines and behaviours focus on establishing and monitoring the project (Denicol *et al.*, 2021), managing the regulative interface (Hughes and Murdoch, 2003) and taking possession of the finished product after delivery (Denicol *et al.*, 2021). The client furthermore certifies, monitors and supervises and finally signs off on the project (Hughes and Murdoch, 2003). The client is thus engaged in the beginning and end phases of a traditional infrastructure delivery project.

The contractor procures and operates the delivery phase (Hughes and Murdoch, 2003). Their routines and behaviours are based on participating in a linear progression of projects due to their project-based organizational context (Lundin *et al.*, 2015), while their project-specific processes often are linear, with clear start and end points (Hughes and Murdoch, 2003; Löwstedt and Räisänen, 2014). Their core is based on a practice-based view and a strong in- and out-group identification (Löwstedt and Räisänen, 2014). The contractor is conventionally involved in the second phase of the project, delivery.

The design engineer's routines and behaviours can both involve advising the client and design development and production, depending on their role in the specific project (Hughes and Murdoch, 2003). Depending on the project and the individual designer's expertise, they can be engaged in a full-time role or in a part-time specialist role (Hughes and Murdoch, 2003). The design engineer is mainly engaged in the first phase of a project, design development.

Thus, there are several separate actors and roles engaged in infrastructure projects, with their own routines and behaviours. Järvenpää *et al.* (2022) call this "clan control" due to the specific social aspects which direct activities within a specific setting. In megaprojects, this number may rise significantly (Denicol *et al.*, 2021). Infrastructure delivery projects are thus characterized by a multitude of inter-organizational interfaces (Jones and Lichtenstein, 2008; Sydow and Braun, 2018), for which a shared understanding of the context is essential.

Institutional logic in megaprojects

Institutional logics are "the set of material practices and symbolic systems including assumptions, values, and beliefs by which individuals and organizations provide meaning to their daily activity, organize time and space, and reproduce their lives and experiences" (Thornton *et al.*, 2012, p. 12) of a particular institution, collectively created and upheld, that shape both the end and the means of individual and organizational behaviour (Friedland and Alford, 1991). Institutional logics are thus context-bound, both defined by and defining the beliefs, values and assumptions of the individuals and organizations enacting them.

Institutional logics impact projects through socially negotiated collective identification, individual and organizational drivers for power and consequence and collectively accepted

categories and sorting mechanisms (Thornton *et al.*, 2012). The meeting of and adapting to different norms and expectations within megaprojects creates institutional pressures (Lin *et al.*, 2021) due to competing logics (Qiu *et al.*, 2019), although this can be alleviated through conscious organizational efforts. For example, Matinheikki *et al.* (2019) found that jointly crafted mechanisms helped mitigate internal conflicts and establish new institutional logics. Moreover, people in equivalent structural positions are theorized to act in accordance with similar institutional logics (Powell and Oberg, 2018). An institutional logics perspective consequently emphasizes the social aspect of institutions as behaviour regulators and foundations of identity, institutional transformation and the link between different analytical levels (Matinheikki *et al.*, 2019; Thornton, 2004), rather than the organization-focused discussion on institutional isomorphism (Glynn and D'aunno, 2023).

Institutional logics in infrastructure delivery projects

Of the seven spheres of institutional logic identified by Thornton *et al.* (2012), expanding on the seminal work of Friedland and Alford (1991), three spheres are especially pertinent in the context of public megaprojects: *corporate market logic*, *bureaucratic state logic* and *professional logic* (Matinheikki *et al.*, 2019).

Firstly, the public client turns to the market to find service providers to deliver their project. Markets are based on self-interest and transactional relationships, legitimized by economic indicators such as share price, and are organized as marketplaces. Corporate institutions are shaped by the market, legitimized by the market position of the firm and are based on both employment relationships as well as formal organizations (Thornton, 2004). In this paper, I will follow Matinheikki *et al.* (2019) in discussing the logic of markets and corporate institutions as *corporate market logic* due to their overlap and the influence of markets on corporations. Corporate institutions influencing infrastructure megaprojects are market forces, such as supply chain (Denicol *et al.*, 2020) and employment dynamics, the participating organizations' market power and position (Thornton *et al.*, 2012), and market drivers of efficiency and legitimacy (Brunet, 2021). The client, often a public organization, mainly acts as a service procurer in the commercial sphere (Denicol *et al.*, 2021). The contractor and design engineer are both project-based organizations (Lundin *et al.*, 2015), providing services in the marketplace.

Secondly, state institutions such as those directing megaprojects (Matinheikki *et al.*, 2019) are based on citizenship and legal bureaucracy, are legitimized by democratic participation and have significant political power (Thornton, 2004). State institutions influencing the construction industry include governmental regulations, industry standardization, procurement systems and the roles and routines in the project (Kadefors, 1995). The client acts in the space framed by regulations and legislation and may wield significant political power, depending on the structure of project delivery and final ownership (Denicol *et al.*, 2021). The contractor and design engineer both act in the same regulative space as the client. The CPDM philosophy has been introduced in part to support innovation and flexibility in public projects (Kadefors *et al.*, 2023; Fred, 2020).

Thirdly, professions are relational networks, based on personal reputation and legitimized by personal expertise and professional association (Thornton, 2004). Together, these three spheres of logics direct the delivery of public megaprojects. Institutional forces related to professions affecting megaprojects include the "four sublimes" of technological, political, economic and aesthetical forces driving megaproject development (Flyvbjerg, 2014), as well as organizational identities (Hietajärvi and Aaltonen, 2018) and the formalized educational processes informing participants, such as MBA programmes. The client and design engineer are often characterized by high levels of formal education and membership in professional bodies, while the contractor is defined as being a "doer" and "tend to be fostered in building

and infrastructure projects, where they acquire their accreditation for promotion" (Löwstedt and Räisänen, 2014, p. 1101). Infrastructure delivery megaprojects are both megaprojects, but also often public projects.

As with other megaprojects, the field of infrastructure delivery is characterized by inter-organizational interfaces (Denicol *et al.*, 2021; Jones and Lichtenstein, 2008) and the uncertainty unique projects face (Flyvbjerg, 2014). Moreover, as public projects, a key challenge of public infrastructure projects is aligning and combining the efforts and resources of multiple organizations on different institutional and organizational levels (Brunet, 2021; Matinheikki *et al.*, 2019). The number of interfaces combined with the public characteristic of such projects increases institutional complexity (Biesenthal *et al.*, 2018) and introduces competing logics (Frederiksen *et al.*, 2021; Matinheikki *et al.*, 2019).

Megaprojects are consequently sites of conflicting institutional logics due to their context, size, duration and the wide disparity between participating actors (Biesenthal *et al.*, 2018; Frederiksen *et al.*, 2021). The difficulties encountered in public infrastructure projects may originate in differences between the institutional logics of the participating actors, which requires relational mitigating mechanisms in addition to the traditional governance mechanisms based on contracts and established ways of working (Matinheikki *et al.*, 2019). In infrastructure delivery, we can thus define three separate actors (client, contractor, design engineer) and the corporate market, bureaucratic state and professional logics impacting them. These are presented in Table 1.

Changes introduced by collaborative contracts

The introduction of collaborative contracts affects the field of infrastructure delivery and is predicted to have far-reaching effects (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015). Collaborative contracts rely on relational governance (Lahdenperä, 2012) and the trust and communication enabled thereby (Lin *et al.*, 2021). Collaborative contracts aim to accommodate differing actor logics, facilitating resource sharing and the establishment of a common goal and unanimous decision-making. The key changes are the introduction of new project roles and processes, in addition to a focus on relationships and informal organizing (Lahdenperä, 2012; Matinheikki *et al.*, 2019; Walker and Lloyd-Walker, 2015).

First, project roles change with the introduction of collaboration coordinators and other project roles concerned with relational processes (Walker and Lloyd-Walker, 2015). Responsibilities can be divided between roles in unusual ways since the models emphasize a single organization rather than mirroring parallel organizations (Lahdenperä, 2012). The roles also change due to the process change introduced by CPDM. Due to the novel division of responsibilities and roles, I might expect uncertainty and conflict as different expectations are met.

	Corporate market	Bureaucratic state	Professional
Client	Acts in the market space, procures services	Public actor or organization acts in a space framed by state regulations	White-collar; bureaucracy; educated; iterative
Contractor	Project-based private firm, service provider	Acts in a space framed by state regulations	Blue-collar; practical; linear
Design Engineer	Project-based private firm, service provider	Acts in a space framed by state regulations	White-collar; bureaucracy; educated; iterative

Note(s): Based on Hughes and Murdoch (2003), Lundin *et al.* (2015), Matinheikki *et al.* (2019)
Source(s): Created by author

Table 1. Different logics affecting the actors

Second, collaborative contracts emphasize the early inclusion of key actors as well as collaborative spaces (Lahdenperä, 2012; Matinheikki *et al.*, 2019; Walker and Lloyd-Walker, 2015), changing the traditional sequential project process. The model furthermore encourages joint tools (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015), such as document management platforms and design software. As the actors involved come from different logical contexts, we might expect conflict to arise when deciding on the execution of these aspects.

Third, strong relationships are perceived as facilitating teamwork and collaboration (Matinheikki *et al.*, 2019). Teamwork and collaboration rely on a shared understanding and a cohesive social group (Hietajärvi and Aaltonen, 2018; Walker and Lloyd-Walker, 2015) which in turn builds on the individuals partaking in the project (Matinheikki *et al.*, 2019). The relational ties within a project are "vehicles for the flow of information, knowledge, resources and reputation" (Powell and Oberg, 2018, p. 460) and enable the spread of logics, stories and rationalized myths (Meyer and Rowan, 1977). As we may expect conflict to arise due to the aforementioned points regarding conflicting institutional logics, the necessary strong relationships might be difficult to build.

Methodology

A case study is a suitable tool to answer the aims of this paper due to the contextual concentration and the inherent search for a broader theoretical understanding (Flyvbjerg, 2006; Ketokivi and Choi, 2014). Since the focus of this paper is to elaborate on the concept of institutional logics in the megaproject context and as people in equivalent structural positions are theorized to act in accordance with similar institutional logics (Powell and Oberg, 2018), a multiple case study can assist the investigation through analysis of several projects with multiple actors with the same role in order to uncover similarities or differences in their behaviour, as well as identify how the project organization deals with conflicting logics. Moreover, a case study building on qualitative methods can give deeper insight into the institutional logics as they are subjective.

Case study selection

The study is based on three public infrastructure delivery megaprojects using collaborative contracts. The studies are presented in detail below. All projects are located in densely developed urban areas and have several public stakeholders involved in the process. The projects can be classified as a megaproject due to their role in the local modal shift towards rail transport, size in their national context as well as the complexity of delivering new infrastructure in an urban context. The projects were moreover all divided into sub-projects. All projects are divided into three phases: procurement, Phase 1 (design and planning), followed by a go – no-go decision, and Phase 2 (detailed planning and construction). In this paper, I will not focus on procurement and pre-project planning, but on Phase 1 and Phase 2 as commonly used in collaborative contracts for infrastructure megaprojects as these constitute project delivery, the focus of the research question. The projects were organized around a collaborative space in Phase 1, where all key actors were expected to attend for activities commonly agreed upon. During Phase 2, the project organization dispersed into separate sub-project offices due to the geographical scale of the projects.

Case 1: shaft. The goal of the project is to build a new light rail line in a major metropolitan area. The project is located in the United Kingdom and is part of High Speed 2, a high-speed railway construction programme. The studied project employs a collaborative contractor joint venture, and the project organization consists of the client and the contractor, who

subcontract the design works. The project crosses multiple city and borough lines, engaging several political processes and has a budget of approximately 5bn euros. Procurement and pre-project planning commenced in 2013 and Phase 1, detailed planning, in 2017. Phase 2, delivery, started in 2020 and the project is expected to finish in 2029 and be operational in 2033.

The project employs shared document platforms and a co-located project office in Phase 1. The client and contractor were seated at the co-located space, while the design engineer attended mainly for meetings. During Phase 2, the project is divided into three main sub-projects with their own project offices. The three main sub-projects are further divided into 22 subdivisions in total. The project also had a steering group comprising senior actors from the participating organizations, who met regularly. Daily operations are managed by a project manager and their management team.

Case 2: station. The goal of the project is to refurbish a central railway station and deliver part of a new rail line in a major metropolitan area. The project shares interface with several other major projects in the vicinity. The project employs an adapted version of early contractor involvement. The project organization consists of the client organization and a contractor firm, who subcontracts the design work. The project's budget is approximately 450 million euros. Procurement and pre-project planning commenced in 2014 and Phase 1, detailed planning, in 2016. Phase 2, delivery, started in 2018 and the project is expected to finish in 2026.

The project employs shared document platforms and a co-located project office in Phase 1. The client, contractor and design engineer were seated in the co-located space. During Phase 2, the project is divided into two sub-projects with their own project offices. The project also had a steering group comprising senior actors from the participating organizations, who met regularly. Daily operations are managed by a project manager and their management team.

Case 3: speed. The goal of the project is to deliver a new light rail line in a major metropolitan area. The project crosses city lines, dividing both responsibility and budget between the two municipal organizations. The project employs an alliance contract and the project organization consists of two municipalities, two design engineering consultancies and two contractor firms. The project's budget is approximately 500 million euros. Procurement and pre-project planning commenced in 2016 and Phase 1, detailed planning, in 2018. Phase 2, delivery, started in 2019 and the project is expected to finish in 2023 and be operational in early 2024. The project finished before schedule and slightly below the projected target price.

The project employs shared document platforms and a co-located project office in Phase 1. The client, contractor and design engineer were seated in the co-located space. During Phase 2, the project is divided into five sub-projects with their own project offices. The project also had a steering group comprising senior actors from the participating organizations, who met regularly. Daily operations are managed by a project manager and their management team.

Data collection and analysis

The study was performed abductively, moving between theory and empirical data. Data collection included interviews, observations (in two cases) and document analysis. Data collection for case *Station* occurred first, between June and October 2019. Data collection in case *Speed* took place between August 2019 and January 2020. Data from case *Shaft* was collected between May and August 2022. A first theory reading gave a framework for our interview guide which was then developed through a pilot study and further theoretical reading. The COVID-19 pandemic disrupted the intended research process but also offered an opportunity for a new perspective on theory which in turn gave a new perspective to the gathered data from cases *Station* and *Speed* and developed the interview guide further for case *Shaft*.

The main data collection method was semi-structured interviews due to the insight into the lived world of interview respondents and the possibility of the breadth of coverage available (Bell *et al.*, 2019; Brinkmann and Kvale, 2018). The respondents were chosen by snowball sampling (Bell *et al.*, 2019) originating from the project manager and covering the main participating organizations. Interviewed roles included project managers, directors, experts and team leads. The roles were similar in the different case organizations. 61 interviews were conducted in total; 20 for Station, 24 for Speed and 17 for Shaft, with interviews ranging between 23 and 172 min, with a mean of 66 and a median of 67 min. Respondents were asked for their understanding of the research and their consent to participate. They were furthermore assured of confidentiality. To ensure data safety the interviews were recorded and transcribed (805 pages) and interview notes were kept in both physical and digital form.

Furthermore, to give insight into routines and behaviours unattainable by interviews (Bell *et al.*, 2019), observations were conducted in case of Station (16 h) and Speed (40 h) in accordance with a pre-determined observation guideline in the co-located project office. The project manager granted observation access to the co-located space in both case projects. Although structured observations of the co-located office are lacking in the case Shaft, they give further depth to the case Station and Speed and a deeper understanding of the project process (Bell *et al.*, 2019).

As is customary for abductive research, data analysis occurred partly simultaneously with data collection. Respondents' descriptions of their roles, routines and behaviours, as well as relationships, formed the basis for the first analysis step and first-order codes in NVivo, whereafter the codes were iteratively ordered into second-order themes. Observation notes and sketches were added to the corpus. The coding labels and themes were inspired by literature pertaining to project roles, megaproject management and infrastructure projects, as well as by themes emerging from the data. Data was analysed both with respect to the participating actor organizations (client, contractor and design engineer) as well as to the respondent's role in the project organization. Observations helped triangulate the individual responses and place them in a larger context. The analysis results were validated through in-depth discussions with other researchers participating in the larger research context this study is part of, as well as with an external panel of industry experts (Brinkmann and Kvale, 2018). Interview respondents are presented in Table 2.

Results

Roles

Actor roles: The client respondents recognized a need for role change in all case projects. They expressed unfamiliarity with being constantly present at the project as well as with working in a co-located space, which changed their project roles and how they performed them. This role change was linked to the public nature of their home organization and the decision-making ability of the client representatives as supported by the public rules and regulations governing their home organization.

Among the contractor respondents, participating in Phase 1 and being part of the design work demanded the largest need for role change and new abilities. In all cases contractor leadership, among them the project leader and other contractor managers, saw a necessity for a new approach when working in a collaborative environment; however, this role change was difficult for the contractor. There was a drive to get "the real work" started and especially respondents in operative roles discussed the collaborative efforts in disparaging terms, dismissing the work done in Phase 1 and at the collaborative co-located space as not adding value to the project and paper-pushing, although members of the leadership teams also expressed similar views. Phase 2 was similar to the contractors' traditional work and did not

Project	Actor	Role	Interviews
Shaft	Client	Collaboration coordinator	1
		Director	2
	Contractor	Collaboration coordinator	1
		Director	6
		Manager	3
	Designer	Director	1
		Manager	1
	External	Director	1
		Specialist	1
Station	Client	Collaboration coordinator	1
		Director	1
		Manager	5
		Project manager	1
	Contractor	Director	2
		Manager	3
		Project manager	1
		Team lead	2
	Designer	Director	2
		Manager	2
Speed	Client	Manager	3
		Director	1
		Project manager	1
	Contractor	Collaboration coordinator	1
		Director	2
		Manager	2
		Project manager	1
		Team lead	2
		Specialist	1
	Designer	Collaboration coordinator	1
		Director	1
		Manager	4
		Specialist	1
	External	Project manager	1
		Specialist	2

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Table 2.
Interview respondents

introduce considerable change in their work process. Although the need for role change was recognized, individual change was slow.

The changes in the design engineer role differed somewhat between projects. In the case Station and Speed, representatives from the design engineer organizations were unaccustomed to working on one project at a time, which was not the case in the case Shaft. However, all design engineers were somewhat unfamiliar with working in a co-located office and especially in collaborating with contractors in developing the design in Phase 1 and participating in the detailed design process at the beginning of Phase 2. A design manager in case Station expressed it thus:

> [The design directors in phase 1] lacked relevant experience. They were of course really experienced, but they had only worked with [public organisation] as a client. And as I said earlier, it's much more relaxed [to work with the public client as project client] than working with [contractor] as [project] client. The designers aren't really used to have demands made. Or haven't ever been part of a project where demands were made in that way, I would say. It's clear that they are used to having demands made, but they have never worked contractor-led before.

Project roles: In the case Speed and Shaft, traditional project management roles and methods were described as unsuitable for the collaborative climate of the collaborative contract and new roles were developed and evaluated. In the case Station participants saw the project as a traditional construction project. In all projects, official project roles followed industry practice, such as for example project manager, design manager and block manager. All projects also had a collaboration coordinator which was described both as a new role introduced due to the demands of the collaborative contract, but also as an old role in a new shape due to earlier experience with similar practices and roles. Although a collaboration coordinator is a role specifically recommended by the CPDM philosophy underpinning collaborative contracting, this role was not seen as new:

> And you find that there are pockets in the whole of the world and in industry, where people have been collaborating for years, and it's now becoming a . . . it's something new to do, something special you do. (Director, contractor, Shaft)

The responsibilities between the roles were however divided in novel ways in all three projects, with for example the collaboration coordinator giving their input in relational matters normally handled by the project manager. In cases of Speed especially, the collaborative leadership team, with representatives from all involved organizations, also changed the project manager's role as all the collaborative contract mandated shared responsibility and accountability, and consequently, all participants in the leadership team had to agree on major decisions related to the project.

Routines and behaviours

Actor routines and behaviours: The respondents from the client were unfamiliar with being part of the project during the entire delivery process. They were, however, used to working iteratively and participating in the political process, which influenced all three cases. The client's assumptions and values were centred on their identity as public servants: decisions were mainly to be taken back to their home organization and decisions made there, and they struggled with the novelty of being present at the project office. They arrive at the office usually between 8a.m. and 9a.m.

The contractor respondents were unfamiliar with being part of Phase 1 (strategic design) and working iteratively. They were furthermore unaccustomed to participating in the public process and viewed both aspects as "wastes of time", as multiple contractors from all three cases said. The contractor was used to making decisions in the project organization and being present at the project office, which led to conflict with the design engineer. They were usually the earliest arrivals at the project office, arriving between 7 and 8a.m.

The design engineer respondents were used to the iterative processes in Phase 1, as well as the public dimension of the projects. They were moreover accustomed to both making decisions in the project organization but also to take larger decisions, such as staffing, back to their home organization. The design engineer respondents were not, however, used to work in a co-located space, expressing a resource loss since they could not access their colleagues at their home offices in their usual way. They were also unaccustomed to being present at the project office, especially in Station and Speed, as their normal working time was divided between many different projects simultaneously. Respondents from all cases brought up the impact of changes during the project process on their work and saw an urgent need for change, especially in relation to how they interacted with the contractor as exemplified by a specialist from the client in case Station:

> The contractor needs to understand that it's not a design-build contract, even though the designer sits in their organisation. This is a turnkey contract where both design and construction needs to be part of the delivery of design.

Project routines and behaviours: Project routines and behaviours mainly followed industry practice in all three case projects, although all projects had instituted a collaborative routine through meetings focused on collaboration. Moreover, all projects had a stated goal of openness and collaboration printed out and placed on the wall in the co-located office, as well as schedules, design drawings and other material expressions of the project process. In Shaft, the programme values were integrated into the interior design of the project offices and in Speed, a considerably smaller project, all individuals involved in the project were encouraged to create a presentation and add it to the wall of "People in the project". They also had several internal awards prominently placed in the office, such as "The collaborator of the year". In Station, the collaboration agreement was printed and displayed prominently on the wall. All respondents viewed change as inevitable in construction projects, but the deadline for the project often did not change when surprises came up during the project process. This influenced the routines and behaviours in the project, as processes mandated by the home organizations or instituted by the project organization for example increased lead times in the project. All projects saw changes in pre-project stages which impacted the schedule, but no project changed the final delivery deadline due to these changes.

> And when we got going [with design work] in March [2018] we were in a hurry because construction had to start, since the schedule hadn't changed. 2024 is still the deadline. (Specialist, client, Station)

This increased tension especially between the design engineer and contractor as reported by respondents from both actors in all three cases.

Relationships

Actor relationships: The client interacted mainly internally and with the design engineer. They did see deeper relationships forming in all case projects due to the increase in interactions due to the co-located project offices. The contractor did not see a deepening of relationships, but this was explained as co-location being normal in contracting work. They mainly worked internally and distrusted the design engineer, viewing them as impractical and not grounded in reality.

The design engineer on their part viewed the contractor as not understanding the nature of design work and insensitive to the project and process changes impacting the design process. This led to relational challenges between contractor and designer in all cases. The design manager from the contractor (Shaft) said as follows:

> What I've experienced is that there's a lot of people [from the contractor] who go "Oh, they [the design engineer] just need to get out in the real world, to see what we're working with." And it's my job to say "Yes, but they have their own reality, it's not just your reality that's the one true one. They have a reality with multiple standards and regulations they need to follow. They too have a reality."

Collaborative contracting and the CPDM philosophy were perceived to require collaborative abilities from individuals, reducing the importance of traditional technical competencies. However, all projects noticed resistance to this change and a degree of cynicism, mainly from the contractor.

Project relationships: During the beginning of Phase 1 (strategic design), all projects had seen conflict and some alignment issues. However, after an initial challenging start-up stage, Phase 1 had been characterized by high levels of trust and relationship building in all projects. However, due to external pressures in Phase 2, collaboration and relationships became more strained. A collaboration coordinator in Shaft described how they built collaborative relationships initially:

> [In phase 1] we were embedded in and building the relationships between [design team], HS2 and [contractor], right the way through stage one, particularly towards getting to notice to proceed.

> There was absolute clarity across the piece of the common goal, knew what it was: Notice to proceed. Everybody wanted it. Everybody knew their role in getting to it. There was that complete alignment there of getting to that same goal. So that worked really well, that gelled the different parts of the teams together.

All participants in case Station saw the project as challenging and laden with conflict. The contract was mentioned by all respondents, the majority of whom described it as a challenge and obstacle. However, although there were relational challenges, the general atmosphere of the project was viewed as positive, except for discussions about budget and contract.

In case Speed, both the client and design engineer viewed their relationship as positive, and the developing project culture as good. However, both designers and client representatives were described as delicate by contractor representatives and "not suited to straightforward truths". Administrative aspects, such as contractual matters or power struggles, were seldom discussed, but the project participants did mention how nice and unfamiliar it was to focus on problem-solving and technical aspects of project work rather than conflict and contract-related issues. This openness was attributed to the good collaborative spirit and the trust created within the project organization due to the collaborative contract. A client respondent in Speed compared the project to those they were used to working in:

> In a traditional project meeting, I wouldn't say the same things that I here can say to the contractor and designer, frankly and honestly.

Institutional logics

Corporate market logic. Actors' institutional logics: The client organizations were all public organizations, beholden to democratic processes. They saw their role as shaping the industry and enabling local sustainability within the construction market. They were, however, concerned with the influence of market logics:

> There is personal gain there, depending on the result you deliver. You see it in your salary, sooner or later. Not all, but many of the higher positions have bonus systems. We [the client] don't have anything like that. I don't make money on receiving a notification or change works, if it costs more or less. I just want things to be right and proper. (Project manager, client, Station)

The contractor firms were all incorporated and traded on stock exchanges. They saw their actions as contributing to the financial results of the company and their role as service providers. The design engineer firms were all incorporated and either traded on stock exchanges or privately owned by trusts. They saw their actions as contributing to the financial results of the company and their role as service providers.

The institutional logic of projects: The projects were all created by a public organization and the service providers were chosen by open request for tender. All projects created joint leadership teams in an effort to create a unified project organization. Case Shaft and Speed did moreover strive to mitigate tensions rising from conflicting corporate logics by jointly designed incentive and governance structures. All projects furthermore had challenges in coordinating people from different organizations due to a lack of administrative power. The project model in case Shaft was founded on legislation and although all actors were happy with the model, they feared that the model would not be used henceforth due to the high risk it placed on the client. In case Shaft, the main project was divided into sub-sections due to the size and political goals of the client organization. Case Station was one of the first projects to use a CPDM in its local context. In case Station, the client cancelled future projects slated to use the same CPDM due to their negative experiences in the case. Case Speed was

also one of the first projects to use a CPDM in its local context. The client in Speed is already using the model in subsequent infrastructure delivery projects due to the perceived benefits of the ongoing project.

Bureaucratic state logic. *Actors' institutional logics*: The client organizations were all public organizations. They were directed by the overarching societal need of the project and requirements set by their home organization regarding for example function and environmental footprint. The client in cases Station and Speed did, however, remark on the difficulty of choosing suitable service providers due to regulations concerning public procurement and clauses prohibiting exclusion of candidates. In general, the client felt a duty towards the public. This was however shared by both contractors and design engineers, who wanted to "make good use of the taxpayer's money" as many respondents remarked. The contractors were used to working with public clients in the construction phase, while the design engineers were used to working with public clients in the design phase. The contractors adhered to regulations for example regarding safety and environmental impact. The design engineer followed applicable regulations for example concerning appropriate design dimensions and demands for structural stability.

The institutional logic of projects: How the projects perceived bureaucratic state logic differed the most between projects. This might be connected to the cultural context since case Station and Speed are located in Nordic countries, while Shaft is a British project. Case Shaft was furthermore created by an act of parliament and thus beholden to political dynamics outside the project:

> Well, it's a massive political project. If you took the politics out, everything would be a lot easier. You know, there's managing messages all the time and, and being seen to do the right thing for all the things you should do anyway. (Director, contractor, Shaft)

Case Station was part of a larger, heavily contested public infrastructure programme which influenced their work. Since the project client in case Speed consisted of two neighbouring and somewhat rival municipalities, the subsequent differences brought political challenges to the project. The client organizations did not align their goals before instructing their representatives on the project, causing confusion. This was seen as being rooted in historical incidents of adversity between the organizations, as well as a recent infrastructure project undertaken together that had gone over both budget and schedule. This was, however, seen as a matter outside the project organization proper and merely a challenge to be overcome, even though it had caused some relational friction in the early project stages.

Professional logic. Actors' institutional logics: The client representatives were mainly highly educated, with a majority holding master's level degrees. There were, however, a few who had a bachelor's degree or had graduated from trade school. In the Nordic countries, people working in the public sector are often, but not always, part of a union which doubles as a professional accreditation organizations. In the UK, professional accreditation and membership in professional organizations play a large role. The client identified with both their home organization and the project. They were furthermore mainly focused on societal good due to their role in their home organization.

The contractors' educational level was mainly trade school or bachelor's level. In the Nordic countries, approximately a quarter of contractors are part of a union. The contractors identified mainly with the project due to the project-based nature of their work. They were focused on delivering a good result they could be proud of, but also with being efficient with the public resources involved. The contractor saw a need for change in the professional logic, tied to the need for role change and related to the attitude of working on a collaborative project. As a director from case Shaft said:

> People. It's just the willingness to change, look at things differently. Not everybody wants to do things differently. Getting new ideas, and it's something that's large and this complex is difficult. People are busy, they don't need the extra hassle.

Design engineers often have a masters' degree. In the Nordic countries, people working in construction design are often, but not always, part of a union which doubles as a professional accreditation organizations. In the UK, professional accreditation and membership in professional organizations play a large role. If the design engineer spent the majority of their time at the project, they tended to identify more with the project, as did the leadership team. Specialists who visited the project found it difficult to gain access to the social sphere built there and identified more with their home organization.

The institutional logic of projects: All projects were characterized by their local context and the professional processes prevalent there. In case Shaft, the respondents' educational background were more varied than in case Station and Speed, where most respondents held masters' degrees, even though the interviewees in case Shaft mainly were part of the management team, while the respondents in Station and Speed were both part of the management team but also team leaders and specialists. Respondents from case Station identified the least with their project and many saw it as a traditional construction job. In case Shaft and Speed, respondents identified more with the project although there were challenges:

> It's been painful, that's clear as day. We have seven different cultures here and everyone have their own way of working. And now we're supposed to create this common playbook. And then all the organizations have other projects going on. So there's been some aching. And design engineers and contractors are so different in nature, actually extreme opposites. So it will take some time to get to know each other, that it will. (Project manager, contractor, Speed)

Discussion

A changing institutional context

The empirical findings presented in this paper illustrate both the changing institutional logics within a project organization as well as how the public client uses megaprojects as a tool to change the (local construction industry) institution. More specifically, the empirical data presented highlights the importance of the inter-organizational coordination of client, contractor and design engineer and wider stakeholder management to stabilize the interaction of sometimes conflicting and contradictory institutional logics. Unlike in traditional project organizations, the increased collaboration and shared responsibility prescribed by collaborative contracting causes tensions between the project organization and the participating actors' home organizations. As roles, activities, values, processes, relationships and logics are interdependent, I will discuss them as one.

Changing project actors: The introduction of collaborative contracting and the CPDM philosophy in the construction industry can be understood as the client's intention of initiating change in the institutional field since the change is more thorough than affecting only one project and is predicted to have far-reaching effects throughout the industry. The success of formalizing CPDM's constituent aspect of relational governance (Lahdenperä, 2012) through collaborative tools, such as collaborative contracts, shared document platforms and new roles, such as collaboration coordinators, in the hope to facilitate trust and communication (Lin *et al.*, 2021) depends on the actors' interpretation of the collaborative contract which in turn is informed by both their institutional background and the organizational structure of the project.

Changing project roles: The slow pace of change in highly institutionalized contexts, such as construction, impacts project role change: project actors navigate the existing processes

and expectations stemming from their institutional and organizational background while simultaneously striving to understand the new requirements set by the collaborative contract and the CPDM philosophy. As the empirical data shows, the projects were based on existing organizational structures and roles (the old institutional framework), but many behaviours aligned with the intended new institution. However, due to the recent introduction of the CPDM philosophy, many project participants lack the requisite experience to participate in such projects, influencing the change process as they returned to familiar roles and behaviours, especially in times of uncertainty and conflict.

The client needed to reorganize due to the requirement of increased interaction with the project, which they were unaccustomed to, while the contractor and design engineer were in the process of finding project roles and relationships that enabled aligning their traditional ways of work. The client did view themselves as more aligned with the project in case Shaft and Speed, indicating a change of perspective on the project (institutional change). In case Station, the client viewed the project as a traditional project despite the collaborative contract (no institutional change). However, in all projects, the client's dual role as both a monitor of and participant in the project introduced tensions in the project organization.

Traditionally, the contractor has been mainly involved in the delivery phase and responsible for delivering finished works (Eccles, 1981; Hughes and Murdoch, 2003). The contractual set-up in cases Shaft and Station, where the contractor subcontracted design and held the main contract with the client, might have worked as a stabilizing force, prohibiting the contractor from re-evaluating their role (no institutional change). In case Speed, the discussion regarding roles was much more probing and evaluative, which might indicate a greater readiness to change conventional roles (potential institutional change). Confirmation thereof requires further study.

The project role change for the design engineer focused on heavier involvement in the project process as compared to their traditional role (Hughes and Murdoch, 2003). In case Shaft and Speed, they partook in project leadership, which was a significant change from their earlier, mainly advisory role (institutional change). Design engineers in these projects identified with the project to a higher degree than in case Station, indicating a deeper change of perspective on the project (institutional change).

Changing project process: The largest process change brought by collaborative contracts was in the collaboration in Phase 1. In line with industry convention, all projects started out client-led, the clients' preferred CPDM philosophy forming the basis of the project organization (Denicol *et al.*, 2021; Kadefors, 1995). However, the clients of all projects took on a larger role than conventional during Phase 1 (strategic design) and Phase 2 (delivery), being present at the co-located project office and involved in the daily work. The client's process changed due to the change to being engaged full-time in the project. They participated in daily project activities, rather than merely monitoring and supervising the process (Denicol *et al.*, 2021), especially in case Shaft and Speed. They did manage the regulative interface (Hughes and Murdoch, 2003) and prepared for taking possession of the finished product, but saw benefits in being present and able to answer questions directly. This influenced the process especially in cases Shaft and Speed, since it enabled the sought-for early inclusion of key actors (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015) and permitted quick knowledge and information sharing in the project, the resulting dialogue (Zheng *et al.*, 2021) creating a mutual understanding of the project (Bygballe and Swärd, 2019). In case Station, however, the client's presence at the project did not have an impact on the process and they maintained their traditional arm's length approach (no institutional change). The reason therefore might be found in the contractual set-up, as conflict arose between contractor and client due to contractual disagreements.

The differences in how contractor leadership perceived the need for processual changes, with case Speed focusing mainly on the way the project was organized and case Shaft mainly

on perceived actor characteristics, might be due to differing levels of shared understanding (Hietajärvi and Aaltonen, 2018; Walker and Lloyd-Walker, 2015): case Speed was based on a single, multi-party agreement and case Shaft on sequential bilateral contracts and the collaborative contract thus shaped the projects' organizational structures. However, both cases saw themselves as collaborative and sharing a common understanding as well as having a cohesive social group. In contrast, case Station, based on sequential bilateral contracts, focused mainly on the challenges between client and contractor, although they did see a need for greater alignment between all actors.

The design engineer's process was affected by the early inclusion of actors and especially the expected collaboration with the contractor as well as their increased role in the leadership of the project. Due to unfamiliarity with their routines and behaviours, a clear clash of cultures was visible in the case Shaft and Speed, and to a lesser degree in the case Station. However, the more iterative process required by the CPDM philosophy and early inclusion of actors (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015) introduced challenges in managing the design process. Although all projects experienced schedule changes in the pre-project phase and in Phase 1, in no project did the final deadline change which led to resentment and conflict. This might be due to the size and complexity of megaprojects (Flyvbjerg, 2014; Qiu *et al.*, 2019): in the studied cases, many participants lacked both an overview of the whole project process as well as insight into the other actors' processes and evolving roles. Since institutions prescribe expectations and actions (Meyer and Rowan, 1977; Qiu *et al.*, 2019), the prevalent institutional framework directed actor choices and activities, leading them to adhere to the known and familiar.

Changing project relationships: Strong relationships in the case Shaft and Speed facilitate teamwork and collaboration through creating a cohesive project understanding and cohesive social group, in line with earlier research (Hietajärvi and Aaltonen, 2018; Matinheikki *et al.*, 2019; Walker and Lloyd-Walker, 2015). The projects were, however, marked by their different contractual frameworks since in the case Shaft, the relationship between client and contractor (who shared the contractual relationship) was dyadic rather than incorporating the design engineer in a collaborative multi-party project, while in the case Speed, the client and design engineer shared a deeper bond due to similarities in professional logic rather than contractual relations, since all main actors shared a multiparty contract. In the case Station, the relationships resembled traditional those found in traditional projects.

Institutions and their logic in megaprojects

Shared understanding: A driver of success in the CPDM philosophy is the strong relationships within the project organization creating a cohesive view of the project and a shared understanding of project categories, processes and goals (Lahdenperä, 2012; Walker and Lloyd-Walker, 2015). Cases Shaft and Speed exhibited changed logics (Matinheikki *et al.*, 2019; Thornton, 2004) and managed to create partly successful collective identification due to their emphasis on a collective project culture, as well as mitigating tensions rising from conflicting corporate logics by jointly designed incentive and governance structures (Matinheikki *et al.*, 2019).

Best for project: All projects moreover had joint leadership teams to create a unified project organization and to comply with local regulations and the political nature of the client organization, which required transparency from the projects and decision-making therein. The actors also worked under the institutional demand of creating public good (Matinheikki *et al.*, 2019) due to the public nature of the projects and expressed a wish to create a beneficial societal impact. Biesenthal *et al.* (2018) remark on the importance of considering the regulative and cultural elements in megaproject delivery: public projects are often governed by local legislature and procurement rules (Kadefors, 1995) and rely on contracts (Eccles,

1981) adhering to their institutional context (Kadefors, 1995; Lin *et al.*, 2021). However, the projects could also be seen as influencing industry standards and processes. Since case Shaft, being part of a larger megaproject, was conceived with the intention of impacting local construction industry, the project was grounded in national legislation, thus by its existence having an impact on bureaucratic logic. In the case Speed, the clients used the same CPDM in subsequent projects, indicating an increased acceptance in the industry for the model.

Conflicting logics: However, the difficulty with coordinating inter-organizational actors (Jones and Lichtenstein, 2008) was evident in the tensions brought up in all cases. Both case Shaft and Speed managed to mitigate conflict by creating a shared project culture and minimizing the importance of the contract on the process (Matinheikki *et al.*, 2019). Since construction is an institutionalized field (Eccles, 1981; Kadefors, 1995), shared classification and categorization did not present problems in general. However, the changing roles did present challenges, especially with respect to the required technical expertise and attitude towards collaboration. Nevertheless, individual drivers of status and power, such as career progression and financial benefits (Thornton *et al.*, 2012), were visible, especially in cases Shaft and Station. This might, however, be connected to their cultural context, requiring further study. The contractual framework, coupled with adherence to traditional institutional logics, hindered collective identification and the adoption of new logics in case Station.

Strong relationships aligned logics and key actors found a common tune in cases Shaft and Speed. The increasing identification with the project organization rather than the home organization, as well as the trust and openness of the project culture, supports the impact of shared understanding and collective identity as a cornerstone for institutional logics (Thornton *et al.*, 2012). Furthermore, the tension between contractor and design engineer was based on conflicting institutional logics, emphasizing the role of relational ties in creating shared understanding (Hietajärvi and Aaltonen, 2018; Thornton, 2004) and alignment of logics (Biesenthal *et al.*, 2018). However, the actors did not align their logics entirely, although a deeper understanding was reached. This dynamic could be interesting for further study.

Institutions help streamline human activity by creating commonly understood and accepted heuristics (Kadefors, 1995; Meyer and Rowan, 1977). There are, still, differences between the heuristics adapted in different institutional contexts (Biesenthal *et al.*, 2018; Thornton *et al.*, 2012) and the nexus of institutional creation, where separate heuristics, norms and behaviours meet, can help us understand the forces shaping institutions. A strong project identity minimized role- and process-based challenges of contests for status and power (Thornton *et al.*, 2012) due to the alignment of expectations and behaviour. However, individual and relational dynamics were still visible, as with the impact of personal bonus systems on project behaviour. The uncertainty inherent in the process combined with uncertainties of construction might push actors to return to familiar routines and leadership roles, as exemplified by the conflicts found in case Station.

The creation of a shared project view depended on the project structure, how the actors interacted in the project space and their understanding of other actors. Thus, the findings emphasize the need to plan project governance carefully (Denicol *et al.*, 2020) and to allocate enough time to create the collective identities wished for (Hietajärvi and Aaltonen, 2018), as well as the importance of finding people with a collaborative outlook to participate in the project if, a change from traditional models are wished for. The project dynamics influencing institutional logics in megaprojects can be conceptualized as follows.

The central project organization, consisting of client, contractor and design engineer, enter a formal contractual arrangement to deliver the project. Using a CPDM philosophy and a collaborative contract calls for the key actors to be fully engaged in the project space created by the project process and organization (Walker and Lloyd-Walker, 2015), as well as for collaborative tools and processes to be applied within the project space (Lahdenperä, 2012). These actors are still connected to their home organizations and thence subject to their

institutional dynamics. This, however, leads to institutional complexity in megaprojects (Qiu *et al.*, 2019), especially in the highly institutionalized construction industry and consequently to conflicting institutional logics (Matinheikki *et al.*, 2019). These conflicting logics interact and create both conflict but also new cohesive and collaborative routines and behaviours when a suitable governance model is utilized and a collaborative culture is created.

Consequently, actors fully involved in the project organization must contend with conflicting logics within the project (Matinheikki *et al.*, 2019). However, megaprojects also affect other individuals in the actor organizations (Qiu *et al.*, 2019), such as specialists, experts or members of the leadership team. These are mainly affected by their home organization but must still find their place in the project organization. They are therefore affected by both the logics of their home organization as well as possible new logics arising in the project. Depending on their role, these individuals can furthermore affect the logics within the project by for example a director deciding on incentive structures, affecting corporate logics or a specialist giving input in technical matters, affecting professional logics.

Finally, some individuals are completely outside the project, but who nevertheless exert power over the project. Such individuals are for example engaged in the client organization and make policy decisions or regulations affecting the bureaucratic logic or the CEO of service providers, re-focusing the corporate logics directing their activities. The project organization, based on a collaborative contract, thus creates a separate sphere of influence where institutional logics from the participating actor organizations can meet in an environment which follows the CPDM philosophy of relational governance. The resulting project structure is presented in Figure 1.

These actors come together during the project process, their understanding of the project is shaped by their background. In the beginning, the conflict of several logics is inevitable, but with the right process and collaborative contract, as seen in Shaft and Speed, differing institutional logics can be commonly understood and aligned for the project. If this interaction gives rise to new institutional logics is outside the scope of this paper. In the case Station, the challenge of including all actors in the beginning led to a retreat to familiar institutional logics

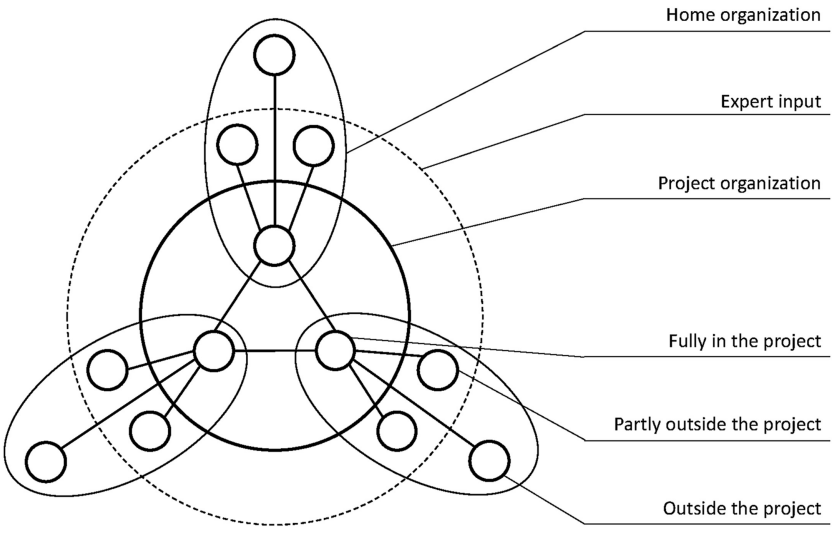

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Figure 1.
Project dynamics impacting institutional logics in megaprojects

and thus no alignment took place. Figure 2 shows the process of aligning logics through the project. Table 3 summarizes the findings and discussion.

Theoretical contributions

Megaprojects function as both an arena of institutional change (Biesenthal *et al.*, 2018) and as a forum for different logics (Matinheikki *et al.*, 2019). This paper makes the following

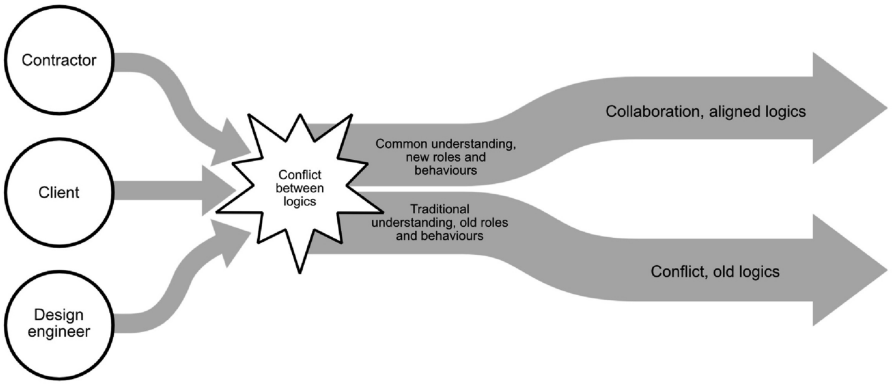

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Figure 2. Alignment of institutional logics through the project

	Client	Contractor	Design Engineer
Roles	Noted a need for more presence at the office, a more collaborative approach and agile decision-making	Noted a need for a more collaborative approach, especially in phase one	Noted a need for more experience in co-location and working with contractors
Process	Unfamiliar with a constant presence at the project office; used to bringing decisions back to their home organization	Familiar with being present at the project office and making project-related decisions there	Unfamiliar with a constant presence at the project office; somewhat familiar with making decisions at the project
Relationships	Interacted mostly with the designer; conflict with contractor re. budget	Interacted mostly internally; conflict with designer re. work and client re. budget	Interacted mostly internally and with the client; conflict with contractor re. work
Corporate market	Acts in the market space, procures services; focus on societal value	Project-based private firm, service provider; focus on monetary value and turnover	Project-based private firm, service provider; focus on monetary value and worked hours
Bureaucratic state	Public actor or organization acts in a space framed by state regulations; sustainability and societal impact emphasized	Acts in a space framed by state regulations; wants to make efficient use of societal resources	Acts in a space framed by state regulations; wants to make efficient use of societal resources
Professional	White-collar; bureaucracy, educated, iterative; wants to do a good job	Blue-collar, practical, linear; wants to do a good job	White-collar, bureaucracy, educated, iterative; wants to do a good job

Source(s): Created by author

Table 3. Summary of the findings

contributions to the field of institutional theory in general and institutional logics in megaprojects in particular. Through the research question, *How are collaborative contracts used to mitigate conflicting institutional logics in megaproject organizations,* the paper expands on our understanding of the alignment of conflicting institutional logics in megaprojects using collaborative contracts and a CPDM philosophy, a novel form of organizing in public infrastructure delivery. This paper answers calls for further insight into megaproject delivery, organizing and management (Biesenthal *et al.*, 2018; Frederiksen *et al.*, 2021; Söderlund *et al.*, 2017) by showing empirical evidence of how megaprojects function as a forum for and tool of alignment of existing logics, and melting pot for new institutional logics.

Practical contributions

This paper makes the following contributions to practice. Firstly, it shows the origins of conflicting institutional logics and emphasizes the interdependence of the project and its surroundings as the interface of logic interaction, thus enabling better project organizing and management. Secondly, it gives an overview of different infrastructure delivery roles, processes and relationships. Thirdly, it shows the importance of accepting the project start as a turbulent phase in the project when institutional logics meet and align, as well as the importance of considering personal characteristics rather than merely technical expertise in selecting people to allocate to a project. Moreover, the practical contributions broaden discussion in relation to Sustainable Development Goals 8, 9, 11 and 12.

Conclusion

The introduction of the CPDM philosophy and collaborative contracts into public infrastructure delivery projects has created a new organizational context and project reality. Such projects require more collaboration than traditional projects and a greater emphasis is placed on social ties and personal characteristics, rather than the conventional focus on technical expertise. The institutional complexity inherent in megaprojects, especially in the institutionalized field of the construction industry, leads to conflicting and evolving institutional logics.

This paper shows how this new context creates new institutional logics through the interaction of corporate, bureaucratic and professional logics in the interface of the project with its surroundings. Furthermore, these conflicting institutional logics interact and create both conflict but also new cohesive institutional logics when a suitable governance model is utilized and the right culture created. The model can contribute to shared understanding and a best-for-project culture. However, both conflicting institutional logics and a change from traditional project logics can create resistance and turbulence in the project organization as people try to find a new equilibrium. This may present as either leadership changes or returning to traditional institutional logics. Thus, collaborative contracts based on the CPDM philosophy can help mitigate conflicting institutional logics in megaproject organizations but are not the sole solution. Their successful implementation requires the right attitude from the participating actors as well as contractual tools.

Limitations and future research

This study is limited by both methodological and practical aspects. Firstly, the multiple case study utilized restricts the generalizability of the findings. However, the deep insight into the cases studied coupled with the unique character of megaprojects can help understand megaprojects in general. Future studies could do a longitudinal study of a single megaproject to see how institutional logics meet and align.

Secondly, the organizational context limits the research since all cases studied are infrastructure delivery construction projects. This limits applicability in other contexts. However, since megaprojects are inter-organizational, this study can still give valuable insight into the megaproject process, regardless of industry. Future studies could compare the findings from this project to megaprojects in other fields.

Thirdly, geographical context limits the research. The cases studied are all infrastructure delivery projects located in the Western hemisphere; two in the Nordics and one in the UK. This limits applicability in other cultural and geographical locations. However, since megaprojects often are inter-cultural organizations, this study can still give valuable insight into the process. Future studies could compare the findings from this project to megaprojects in different geographical locations.

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