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Megaprojects as organizational platforms and technology platforms for value creation

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Highlights

- This study advances knowledge on value creation in megaprojects research
- Megaproject's organization is conceptualized as an organizational platform
- We derive 5 propositions from our empirical analysis that explain how actors create value
- Actors create value through jointly planned and governed design principles
- Actors create value through value-leveraging activities

Megaprojects as organizational platforms and technology platforms for value creation

Abstract

Megaprojects are multi-actor and multi-technology constellations that create value for society. Previous research on joint and coordinated activities to create value for multiple actors in megaprojects over system lifecycle is scarce. This study explores how the actors in a megaproject jointly create value. We analyze value creation in megaprojects by theorizing on the research on organizational platforms, which draws together knowledge from research on other types of platforms, ecosystems and networks. In our empirical study, we analyze a city district renewal megaproject, by focusing on the actors' joint activities that contribute to synergetic project processes, solutions and outcomes both tangible and intangible that participating actors find beneficial. We derive five propositions that explain how actors in a megaproject create value by establishing inter-organizational bodies and joint routines and activities that share ownership and decision-making. Findings also explain how leading actors facilitate megaproject actors' competition and value capture that determine most suitable participants to value-creating activities.

Keywords: megaprojects; organizational platforms; technology platforms; value creation; innovation; ecosystems.

1. Introduction

Megaprojects are multi-billion dollar, long-lasting endeavors that are established to create long-term value in society (Orr et al., 2011). In megaprojects, constellations of multiple actors delivers the long-term value, for example by establishing modern public transportation systems, novel digitalized technologies, massive events like Olympics, and healthcare solutions (Rego et al., 2017; Sergeeva and Zanello, 2018). Value in megaprojects is created jointly among the participating actors, and such value is not only limited to pecuniary value, but it also includes long-term societal and even global benefits among actors who are not actively participating in the megaproject (Laursen, 2018). Nonetheless, megaproject actors have their own objectives, expectations, interests, planning horizons, and motives that may be aligned or in conflict and thus, they can influence value creation (Artto and Kujala, 2008). Thus, megaprojects are managed as multi-actor and multi-technology constellations with an emphasis on value creation (Zhai et al., 2009).

There is a wealth of research on how single strong firms like contractors or systems integrators (Davies, 2004) coordinate value creation, and create value for the megaprojects' sponsors (Eweje et al., 2012). However, less attention has been directed to how multiple actors coordinate together and create value jointly for many actors in megaprojects, without few exceptions (Artto et al., 2016; Laursen, 2018; Matinheikki et al., 2016) that focus on value-creating activities only in a single project phase at a time. Based on the above, the evident theoretical and practical problem for managing megaprojects is the challenge for multiple actors to conduct joint activities over system lifecycle that create value for many actors. To obtain a more complete and profound understanding of value creation in megaprojects, we address the following research question: How do the actors in a megaproject jointly create value?

In addressing the research question, we apply a broad perspective to value creation and value to enable rich theorizing and abundant exploration, by focusing on the participating actors' joint activities that

contribute to synergetic project processes, solutions and outcomes both tangible and intangible that participating actors find beneficial. In our study, we theorize on the research on organizational platforms. The organizational platform research draws together concepts and assumptions from research on other types of platforms (Gawer and Cusumano, 2014 on technology platforms; Thomas et al., 2014 on platform ecosystems), ecosystems (Autio and Thomas, 2014 on innovation ecosystems; Iansiti and Levien, 2004; Moore, 2006, 1996, 1993 on business ecosystems) and networks (Gulati et al., 2012). In essence, an organizational platform is an organizational structure that stores multiple actors and their intangible and tangible resource constellations with the purpose to create value jointly (Lusch and Nambisan, 2015; Perks et al., 2017; Thomas et al., 2014).

Our empirical inquiry is on a single case study of the Tapiola project—a megaproject initiated for renewing the Tapiola district in the metropolitan area of Finland. The project started in 2004 and will be completed in 2020 with a total investment of EUR 3.4 billion. We collected qualitative data about the Tapiola project from 2004 until 2017. The primary data came from 27 interviews conducted from 2011 to 2017, which we supported with archival data. In our analysis, we focused on the organizational-level by scrutinizing individuals, actions, purposes, intentions, and distinct events related to the management of the megaproject and its organizational platform.

The findings from the empirical analysis unravel five propositions that explain how actors in a megaproject create value. First, our findings show that megaproject actors create value through jointly planned and governed design principles. These design principles include independent and self-managed trajectories where actors establish inter-organizational bodies, joint routines and activities that emerge from the platform actors' interactions. Jointly established bodies and activities help actors to complement each other and develop their resources in synergetic ways. Second, our findings point out that megaproject

actors create value through value-leveraging activities. These value-leveraging activities are leading actors' coordination, competition among megaproject actors and megaproject actors' value capture that is connected to megaproject's certain partial products, technologies and solutions. Megaproject actors' value capture connected to certain outcomes provides single actors the motivation to participate and contribute into the joint activities and organizational bodies, whereas competition among actors then determine the most suitable final contributors for joint activities and organizational bodies. Leading actors coordinate and facilitate megaproject actors' value capture and competition.

We have organized the paper as follows. First, we review literature on value creation in megaprojects research to introduce our phenomenon and to position our paper in relation to existing body of knowledge. Second, we review research on organizational platforms to derive focal characteristics, and understanding of value-creating mechanisms for our empirical study. Third, we introduce the method and analyze our empirical case. Fourth, we introduce our findings in form of a narrative. Fifth, in the discussion, we translate our findings into contributions, and provide implications to practitioners. Finally, we conclude with future research directions and limitations.

2. Conceptual background

2.1. Value creation in megaprojects research

Urban development, novel technologies, energy and raw-material production plants, huge constructions and vessels, massive events and healthcare solutions are examples of megaprojects (Davies et al., 2009; Morris and Hough, 1987; Stinchcombe and Heimer, 1985). According to Flyvbjerg (2014), megaprojects cost over billion dollars, take years to develop and complete, involve continuously changing actor network and have a great impact to society. Megaprojects can be defined as invariably changing systems (Morris, 2013), where new actors with new or alternative technologies continuously enter these systems while

other actors leave (DeFillippi and Sydow, 2016). Hence, megaprojects have highly dynamic boundaries. Based on the above characterization, megaprojects are complex multi-actor and multi-technology constellations with a purpose to create and deliver long-term value for multiple actors and for the society as a whole (Zhai et al., 2009).

Value creation in megaprojects has been approached from outcome-based and system lifecycle-based perspectives. From the outcome-based perspective, a megaproject creates value after the project's completion for the organizations participating in it, when it achieves the desired outcomes set initially in strategic front-end phase (Edkins et al., 2013). The desired outcomes revolve around single actors' pecuniary value and short-term project success criteria, such as staying in schedule, budget and scope. The outcome-based view emphasizes the sponsor's role with a notion that the project must create value for the project's sponsor (Eweje et al., 2012).

The system lifecycle-based perspective (Artto et al., 2016) enables a multifaceted value conception: to look at longer into the future, i.e. by looking at the value and its creation not only during the project, but also after the project is completed in operations phase (Matinheikki et al., 2016). Here, value is not limited to monetary value for the participating actors, but it also includes tangible value (Morrow, 2011). For instance, actors may develop new long-term innovations and solutions, such as modern transportation facilities that emphasize joint benefits among actors in the megaproject (Brady et al., 2005), but they can also provide different benefits to actors in broader environment and society (Eskerod and Ang, 2017). The value definition also takes into account intangible value (Artto et al., 2016). This means that value includes also immaterial offerings, such as new valuable relationships and knowledge among actors, and the resultant organization in operations phase (Laursen, 2018). Since our research is very explorative in nature, we adopt a broadminded view on value to enable rich theorizing, and not to delimit our findings

in advance of analysis. We define value as synergetic project processes, solutions and outcomes both tangible and intangible that participating actors find beneficial.

Megaproject actors can create value by conducting activities together (Matinheikki et al., 2016) and by seeking to align single actors' goals and creating a clear strategic vision of the project's outcome (Shenhar and Holzmann, 2017). However, megaproject actors may also destruct value by acting against each other's interests, or violate the value of the whole system when pursuing their own interests only. That is to say, megaproject's actors often use their own objectives, business interests, planning horizons, and motives as primary drivers, which stem from different actor-specific business and value creation logics that may fall outside the scope of the project operations (Artto and Kujala, 2008). Hence, megaproject actors negotiate who can capture value, and based on value propositions, actors assess whether it is worthwhile to participate to value-creating activities (Laursen, 2018). If we accept the notion that value creation in megaprojects requires active involvement of all participating actors doing the project together, then we can define value creation as joint activities among several actors, which contribute to synergetic project processes, solutions and outcomes both tangible and intangible that participating actors find beneficial.

Value creation in a megaproject unfolds as a process (Davies, 2004), which may be coordinated by an actor that integrates actors and their inputs into the megaproject (Davies and Mackenzie, 2014). Nonetheless, knowledge of the concrete activities and mechanisms that constitute the value creation process is far from complete. Matinheikki et al. (2016) analyzed the early front-end phase of a large healthcare campus project and found four management activities, such as assigning a leader role to a focal actor, that contributed to value creation through relational, cognitive and structural network attributes. Laursen (2018) analyzed the execution phase of two mid-sized cultural projects and found five distinct activities from service-dominant logic perspective, such as developing network infrastructure that

focused on creating nonfinancial value during the project. Artto et al. (2016) focused on large shopping center project's late operations phases, and found four integration mechanism themes, such as coordinating body that create value from systems view. Based on the above literature review, we argue that the existing megaproject management research will benefit from a more complete and in-depth understanding of value creation over the system lifecycle.

2.2. Value creation in organizational platform research

The platform research explains the competitive advantage and success of single firms through technology, market, and product platforms (Cusumano and Gawer, 2002; Gawer and Cusumano, 2014; Meyer and Lehnerd, 1997) that enable single firms to achieve business growth and capture value (Gawer and Cusumano, 2014; Nambisan and Sawhney, 2011). While existing platform research focuses on single firm's value capture perspective, recent advancements have taken a value creation perspective, for instance Perks et al., (2017) on value platforms and Thomas et al., (2014) on platform ecosystems that describe the combination of different platforms, where organizations and technologies are designed to create value.

From value creation perspective to platform research, we derive the concept of organizational platform, which is an organizational structure that stores multiple actors and their intangible and tangible resource constellations with the purpose to create value jointly (Lusch and Nambisan, 2015; Perks et al., 2017; Thomas et al., 2014). Value is contextual, phenomenological and unique (Lusch and Vargo, 2014: axiom 4), meaning that it includes both tangible (e.g. pecuniary value, technologies, innovations, products and constructs) and intangible (e.g. operational systems, services, solutions, relationships and knowledge) offerings, of which benefit actors define in distinct ways. An organizational platform includes actors from the production (e.g., contractors and technology providers) and consumer (e.g., end-user and customer)

sides (Thomas et al., 2014). Hence, organizational platforms resemble similar kinds of entities as megaprojects.

Actors in organizational platform have two key characteristics, specialization and complementarity. Specialization means that actors and their distinct technological or other resource inputs are specialized, and as such, a specific actor and its input are extremely essential for the platform's existence (Thomas et al., 2014). Specialization enhances individual actors' innovation and operational efficiency that promote opportunities for value creation at platform level (Autio and Thomas, 2014). Complementarity (also: co-specialization) denotes that the actors and their distinct inputs in organizational platforms match each other well, to produce a valuable output that is more than the sum of its inputs (Autio and Thomas, 2014; Gawer and Cusumano, 2014). Complementarity realizes and deploys the value of the specialized inputs at the level of the platform (Bovet and Martha, 2000; Parolini, 1999). However, specialization also means that actors are very heterogeneous and thus, they may have divergent objectives that can hinder complementarity and therefore value creation at the level of the whole platform (Moore, 2006, 1996).

The matching of distinct actors and their inputs is characterized as co-evolution (Autio and Thomas, 2014). Co-evolution facilitates actors to provide more complementing yet specialized inputs that enhance value creation at platform level (Moore, 1996, 1993). The literature also provides some understanding of activities and mechanisms that constitute such co-evolution process. For instance, actors can also share their assets and resources, and form a system-level goal for the platform that aligns actor specific goals (Gulati, et al., 2012). In forming the system-level goal, actors can jointly develop and agree on routines and practices, such as by establishing guidelines, working groups and offering common tools to enact coherence between actors (Nambisan and Sawhney, 2011).

Even though actors are highly specialized and complementary in organizational platforms, there exists multiple potential providers for any input, and alternative providers can come from the platform or even outside the current platform's boundaries (Armstrong, 2006). These alternative input providers may have more specialized or complementary inputs, which can lead into competition about who can contribute to platform's value creation (Tiwana, 2015).

While organizational platforms are characterized as evolving entities, the literature has also addressed the role of a coordinator (Moore, 1993) or leader (Cusumano and Gawer, 2002; Gawer and Cusumano, 2008). This means that a resource-rich actor can become a leader or coordinator that governs the direction of the platform (Perks et al., 2017). In essence, a platform leader or coordinator can facilitate the above addressed co-evolution and competition, meaning that it can have a crucial role in determining the platform level value creation (Eloranta and Turunen, 2016). The leader can utilize rather similar governance activities as found in co-evolution process above, but instead of actors organizing jointly, this one leader actor instigates and establishes them.

Although value creation is the core of organizational platforms, it is still important to understand that each participating actor must capture a sufficient portion of the overall created value (Peltola et al., 2016). This means two things. First, an actor does not capture value at the expense of other actors. Second, assumption of single actor's future value capture justifies and legitimizes single actor's participation in the organizational platform's activities and value creation (Adner and Kapoor, 2010).

2.3. Theoretical perspectives from megaproject and organizational platform research for empirical study

In Table 1, we have summarized the focal characteristics and mechanisms from our literature review that provide concluding arguments for value creation in megaprojects. The first column introduces focal

characteristics from megaprojects and organizational platforms related to value creation. The middle column provides key value-creating mechanisms in megaprojects and organizational platforms research that are connected to the focal characteristics. The last column provides concluding arguments concerning value creation in megaprojects as organizational platforms. We use this table as a framework in our empirical study.

Table 1. Summary of theoretical perspectives from megaproject and organizational platform research related to value creation.

Focal characteristics of megaprojects and organizational platforms related to value creation	Key value-creating mechanisms connected to focal characteristics of megaprojects and organizational platforms	Conclusions concerning value creation in megaprojects as organizational platforms
Actors with new or alternative technologies continuously enter megaprojects while other actors leave (DeFillippi and Sydow, 2016). Actors and their distinct technological or other resource inputs are specialized, and as such, a specific actor and its input are extremely essential for organizational platform's existence (Thomas et al., 2014)	Actors' technologies can generate new long-term innovations and solutions that benefit many actors (Eskerod and Ang, 2017). Specialization enhances individual actors' innovation and operational efficiency that promote opportunities for value creation at platform level (Autio and Thomas, 2014).	Activities that enhance actors' specialization in megaprojects can create value
Megaproject actors have their own objectives, expectations, interests, planning horizons, and motives that may be aligned or in conflict (Artto and Kujala, 2008) Actors and their distinct inputs in organizational platforms complement each other well, to produce a valuable output that is more than the sum of its inputs (Gawer and Cusumano, 2014; Autio and Thomas, 2014).	Goal alignment among several actors (Shenhar and Holzmann, 2017) contribute to synergetic project processes and outcomes, and hence value creation at the level of the megaproject. Complementarity realizes and deploys the value of the specialized inputs at the level of the platform (Bovet and Martha, 2000; Parolini, 1999).	Activities that enhance actors' complementarity in megaprojects can create value

Megaprojects can be defined as invariably changing systems (Morris, 2013) with highly dynamic boundaries. The matching of distinct actors and their inputs in organizational platforms is characterized as co-evolution (Autio and Thomas, 2014).	Megaproject actors conduct activities together (Matinheikki et al., 2016) that contribute to synergetic project processes and outcomes, and hence value creation at the level of the megaproject. Co-evolution facilitates actors to provide more complementing yet specialized inputs that enhance value creation at platform level (Moore, 1996, 1993).	Activities that constitute co-evolution in megaprojects can create value
Megaproject actors may act against each other's interests by pursuing their own interests only (Artto and Kujala, 2008). Multiple potential providers compete for any input in organizational platforms, and alternative providers can come from the platform or even outside the current platform's boundaries (Armstrong, 2006).	Megaproject actors' selfish behavior may destruct value (Artto and Kujala, 2008). Competitors may have more specialized or complementary inputs, which can lead into competition about who can contribute to platform's value creation (Tiwana, 2015).	Activities that facilitate competition in megaprojects can create value
Value creation in a megaproject unfolds as a process (Davies, 2004), which may be coordinated by an actor. Resource-rich actor can become a leader (Gawer and Cusumano, 2008) or coordinator (Moore, 1993) that governs the direction of organizational platform (Perks et al., 2017).	One actor may coordinate megaprojects by integrating actors and their inputs into the megaproject (Davies and Mackenzie, 2014). Platform leader or coordinator can facilitate co-evolution and competition, having a crucial role in determining the platform level value creation (Eloranta and Turunen, 2016).	Activities that promote a leader role in megaprojects can create value
Megaproject must create value for the project's sponsor (Eweje et al., 2012). Each participating actor in organizational platform must capture a sufficient portion of the overall created value (Peltola et al., 2016).	Megaproject actors negotiate who can capture value, and based on value propositions, actors assess whether it is worthwhile to participate to value-creating activities (Laursen, 2018). Single actor's future value capture justifies and legitimizes single actor's participation in the organizational platform's activities and value creation (Adner and Kapoor, 2010).	Activities that ensure value capture in megaprojects can create value

3. Research design, data collection, and analysis

3.1. Research design

The objective to improve the current understanding of value creation in megaprojects is a complex challenge; therefore, we chose to collect rich qualitative data of the phenomenon in a real-life context over time. We investigated megaproject context using a single case study design (Siggelkow, 2007), by selecting Tapiola district development megaproject. We considered this case to be a suitable context for this study, because it had a varying multi-actor constellation with different resource inputs and

specializations that had been interacting and evolving over time, illuminating value creation dynamics in megaprojects.

3.2. Descriptions of the context and actors that participated in the megaproject

The Tapiola district development megaproject (Tapiola project) is a megaproject that aims to renew the Tapiola district in the city of Espoo in Finland. The Tapiola project started in 2004 and is scheduled for completion in 2020. Tapiola is famous internationally as a spacious garden district and the cultural cradle of the metropolitan area that highlights postwar modernism. The district includes historical architectural designs, such as its famous center tower, fountains and public pool (which becomes a skating rink in the winter), cultural center, theater, modern art museum and library that all helped inhabitants recover from World War II. This heritage must be valued and preserved at the national level throughout the district development project.

The final product of the Tapiola megaproject is a nine-story shopping center spread across five distinct buildings at various levels (i.e., ground, underground, and aboveground), as well as luxury residential condominiums and apartments above the shopping center. The megaproject also includes a new centralized underground parking facility with more than 2,000 parking bays. Finally, the megaproject includes a brand-new metro station and a new regional main bus terminal. The megaproject's final product will honor postwar modernism in terms of its design and ambience. The garden district and its ambience will be enhanced by a spacious new park, garden areas, and roof terraces, as well as by restoring a historical roundabout that was demolished in the 1970s.

Table 2 introduces the 14 actors who participate in the Tapiola project's organizational platform and who invested over EUR 3.4 billion in total. In the last column, we have characterized the actors' roles within

the organizational platform, whether they are more leading actors or members. This dichotomy emerged from the data depending on how active an actor was in contributing to the platform's development. Leaders are active contributors and members are more followers.

Table 2. Actors participating in the Tapiola project's organizational platform.

Actor	Description	Role in organizational platform
City of Espoo	Municipality actor and owner of the project, because Tapiola district is located in City of Espoo.	Lead actor
LocalTapiola Real Estate Asset Management Ltd. (abbreviated to LocalTapiola)	Large real estate investment and development department of a large insurance corporation, who is the main investor, developer, and real estate owner in Tapiola.	Lead actor
Sponda PLC	Real estate investment trust that operates in Finland and Russia, and has real estate ownership in Tapiola.	Member
Wereldhave N.V.	Dutch real estate investment company with global operations, and has real estate ownership in Tapiola.	Member
Etola Group	Conglomerate operating in Finland that focuses on importing in several industries, and has real estate ownership in Tapiola.	Member
Nordea Life Assurance Finland Ltd. (abbreviated to Nordea)	Life insurance company that is part of a large European financial services provider Nordea Group, and has real estate ownership in Tapiola.	Member
SARC Architects	Famous architectural firm in Finland responsible for master planning.	Lead actor
HKP Architects	Recognized architecture and design firm in Finland, responsible for reference planning and later designing the centralized underground parking facility.	Lead actor
Indepro Consultants	Consulting company in Finland that specializes in project management and real estate construction supervision, providing consultancy to lead actors.	Lead actor
Tapiola Guild (residents' association)	NGO that represents the consumer side of the project by promoting the interests and opinions of residents in Tapiola.	Member
National Board of Antiquities (abbreviated to NBA)	Government authority that preserves and protects Finnish historical and cultural heritage, regulating development in Tapiola.	Member
Lemminkäinen Ltd.	Construction company operating in Scandinavia, the Baltic countries, and Russia, being one of the main contractors in the Tapiola project.	Member
SRV Group	Consolidated corporation focusing on supervising and managing real estate and construction projects that operates in Finland, the Baltic countries, and Russia, being one of the main contractors in the Tapiola project.	Member
Propdea Re-Team Consultancy	Designer and retail planner company who was one of the commercial profile designers of the new Tapiola premises.	Member

The relationships among members and lead actors in Tapiola project's organizational platform are rather complex and dynamic. Therefore, in Figure 1, we depict the organizational platform's organizational chart as a general demonstration of the interconnectedness of different actors.

Figure 1. Tapiola project's organizational platform

We have divided the organizational platform's actors to members and lead actors in Figure 1. For analytical clarity, we have grouped Nordea, Etola, Sponda and Wereldhave into one sphere, since they possess similar connections to other actors. The organizational platform's boundary lines are dashed, and illustrate that there exists permeability in the system. That is, an actor can enter the system and become a member or leader. Vice versa, an actor can exit the system at any given time. The denser and less

transparent dash line for lead actors' boundary indicates that it is more difficult to become a lead actor in the system than to become a member. The thicker connection lines among lead actors in Figure 1 illustrate that lead actors have stronger connections to each other compared to member-member or member-leader connections.

Figure 2 demonstrates Tapiola project's project timeline including project phases and events.

Figure 2. Tapiola project's timeline of phases and events

3.3. Data collection

We conducted 27 semi-structured interviews between 2011 and 2017 to obtain a rich data set. We interviewed nine actors from both member and lead actor sides, and persons in several different roles to cover a range of perspectives for transverse coverage. We recorded and transcribed the interviews. We utilized purposeful interviewee sampling (Denzin and Lincoln, 2005) based on public information (e.g. news articles and City of Espoo's reports) about the megaproject that helped us to define the organizational platform's initial boundaries. We also used the snowball sampling method (Biernacki and Waldorf, 1981) and asked the interviewees for the names of other relevant knowledgeable informants and actors in the megaproject to form a more accurate understanding of the platform's boundaries. We relied on guiding questions and the interviewees' own interpretations of events and actions. First, we asked the interviewees to introduce themselves and provide a short description of their background. Then, we asked the interviewees to describe their organization's role, as well as their own personal role in the megaproject and how the megaproject developed from their perspective. At this point, we provided guiding and open-ended questions to ensure that the interview focused around various actors, their activities and arrangements, and changes in them that were connected to value creation at the platform level. Table 3 lists the interviewees included in this study.

Table 3. List of subjects interviewed for this study.

Round No.	Interviewee organization	No.	Interviewee (interview duration in minutes)
First interview round in 2011	City of Espoo	1	Property manager (79 min)
		2	Director of urban planning unit (50 min)
		3	Director of commerce (79 min)
		4	Development director (102 min)
		5	Project manager (138 min)
	LocalTapiola	6	CEO (64 min)
		7	Manager of real estate development (69 min)
		8	Head of real estate investment (61 min)
		9	Real estate manager (114 min)
		10	Fund manager (69 min)
	End-users	11	Senior citizen (80 min)
Second interview round in 2012	City of Espoo	12	Chairman of the urban planning unit board (60 min)
	SARC Architects	13	Architect, partner (102 min)
	Tapiola Guild	14	Chair and Member* (133 min)
	National Board of Antiquities	15	Department manager and Senior specialist* (105 min)
Third interview round in 2015	SARC Architects	16	Architect (101 min)
	LocalTapiola	17	CEO (74 min)
		18	Manager of real estate development (95 min)
		19	Head of real estate investment (77 min)
		20	Manager of real estate investment (77 min)
		21	Shopping center manager (82 min)
		22	Real estate manager (76 min)
	Indepro Consultants	23	Consultant, partner (93 min)
City of Espoo	24	Project manager (70 min)	
Fourth interview round in 2016	Stockmann Group	25	Director of the department stores (81 min)
	Western Metro Ltd	26	CEO (57 min)
	City of Espoo	27	Chairman of the urban planning unit board (21 min)
*Joint interview			

We also collected a data archive of documented material retrospectively from 2004 and continued in real time from 2011. The archive contains more than 200 unique sources of newspaper articles, project reports, presentations, brochures, company reports, and detailed plans. We used this data for triangulation purposes. In practice, we verified the chronology of different events and actions, such as important transactions, meetings, activities, decisions, and contracts that played a crucial role in how the megaproject and its organizational platform developed.

3.4. Data analysis

We analyzed the Tapiola project's organizational platform from its early project phases in 2004 until the late execution and operation phase in 2017. We specifically followed the activities of leading actors (City of Espoo, LocalTapiola, HKP Architects, SARC Architects, and Indepro Consultants), who were heavily involved in the activities that designed the platform's future direction. We focused our analysis on organizational-level by scrutinizing different actors' individuals, actions, purposes, intentions, and distinct events related to the management of the megaproject and its organizational platform. Our logic of reasoning is abductive (Ketokivi and Choi, 2014), because we are informed by organizational platform literature, which concepts and their relationships we apply to understand their contextualized logic in megaprojects. We iteratively investigated the case context and literature in a balanced manner by applying generally accepted qualitative data analysis procedures (e.g. Gioia et al., 2013). We used ATLAS.ti to analyze the transcribed interviews, and we used the documented data archive for triangulation in order to confirm the chronology (Jick, 1979).

Our analysis consisted of four iterative steps. First, we produced a general description and chronology of key events, related actors, and their activities with as accurate timestamps as possible, which we achieved by triangulating the documented data archive. Here, we extracted general themes related to the megaproject's organizational platform from the data using the language (e.g. a quotation or a descriptive phrase) of the interviewees. For instance, one key theme is 'real estate business', in which LocalTapiola purchased and acquired real estates (i.e. specialized inputs of other actors) from other real estate owners at specific years. Second, we analyzed and discussed the differences and similarities between the general themes, and interpreted and identified empirical activities that were related to the different value-creating characteristics and mechanisms we derived in conceptual background from megaprojects and

organizational platform research. For instance, the actors established several jointly governed working groups that aimed at matching actors and their specialized inputs to solve specific issues in the megaproject's development. Third, through iterative development and discussions among researchers, we developed five propositions from the previous empirical activities. In formulating the propositions, we utilized the derived conclusions concerning value creation in megaprojects as organizational platforms in Table 1 that augmented us to translate the empirical value creation phenomenon in terms that are more theoretical. In practice, we connected the empirical activities to specific concepts, characteristics and mechanisms from organizational platform and megaproject research, and further, we connected these concepts to jointly created value in the megaproject case context. For instance, our first proposition argues that joint organizational bodies that various actors govern jointly facilitate actors' complementarity and specialization, which creates value such as collectively beneficial megaproject outcomes and solutions. Fourth, we developed two aggregate themes for our propositions that address our original research question in a strategic view: jointly planned and governed design principles, and value-leveraging activities.

4. Developing propositions

We present our findings in form of a narrative with illustrative quotations to enhance the trustworthiness of our methodology. We use our two aggregate themes as headings in subsections 4.1 and 4.2, where we provide the analysis and inherent reasoning behind each of our propositions connected to these themes.

4.1. Jointly planned and governed design principles

The businesses in Tapiola were suffering in the early 2000s because of the economic recession in the 1990s. For the sake of their business, the real estate owners wanted to develop the area and its businesses to be more attractive to tenants and customers. Land and real estate ownership had always been highly

fragmented, including several owners with different interests. This fragmentation created a problem with coordinating the early planning, and the City of Espoo as the town planning authority had to hold separate discussions with each owner, which resulted in divergent and even conflicting proposals that were impossible to integrate. Thus, the City of Espoo suggested a mutual communication channel to make communication easier. The real estate owners—LocalTapiola, Wereldhave, Sponda, Etola, Nordea, and the City of Espoo—established a jointly controlled organizational body called Tapiola Area Development (TAD) in 2004. TAD functioned as a platform-specific organizational body and coordinating artifact that connected several specialized actors. The purpose was to unify the conflicting proposals and find a mutual agreement by organizing regular meetings and collectively agreeing on future development activities. These TAD meetings helped actors to get to know each other and their specializations better in the development process. That is, actors could understand how to develop their inputs and complement each other in synergetic ways to overcome complex issues that were otherwise obstacles for synergetic project outcomes such as district's increased accessibility, modern transportation possibilities, and new businesses and services. A manager from one of the real estate owners said: "I could claim that no development, or at least in this scale, would have been implemented if the [real estate owners] had not co-operated and formed an organ, which is the actor who pulls this project onward and unifies the fragmented voice and ownership of the area".

Thereafter, the lead actors along with other real estate owners, founded over 40 other jointly controlled platform-specific organizational bodies over the system's lifecycle, including task forces, steering groups, and committees that met at regular intervals and had collective and open rules. These organizational bodies brought together various actors from both consumer and production sides, to solve jointly complex issues regarding certain sub-systems, such as the underground parking facility and landscape architecture. Concrete examples are the Tapiola design team, the maintenance and surveillance system task force, the

fire safety system committee, and the parking facility steering group. The actors participating in specific bodies had to enhance their specialized inputs in synergetic ways to be able to overcome complex issues that are otherwise obstacles for synergetic project solutions and outcomes. These organizational bodies were crucial enablers for synergetic solutions, such as what kind of parking facility would be the most accessible to motoring folk, meaning that they had evident role in creating value. One manager from one of the real estate owners described it as follows: “We have these different working groups, for which our participation and influence are important. These working groups consist of, for instance, representatives of the City of Espoo, consultants, tenants, and real estate owners”. Based on the above, we propose:

Proposition P1: Jointly governed organizational bodies function as foundation for participating actors to get together and develop jointly their specialized inputs to complement each other in synergetic ways to overcome complex issues that are otherwise obstacles for synergetic project solutions and outcomes.

The actors in the newly formed TAD initiated and executed several intricate feasibility studies with consultants in order to determine what should be done in the area to enhance its value and attractiveness. These feasibility studies helped actors to determine the future assets, prospects and boundary circumstances for the project. TAD actors openly shared and integrated these complex actor-specific studies, plans, pamphlets, and reports, by sharing ownership and decision-making, which supported learning from each other. These joint activities put aside individual actors’ self-absorbed business schemes and focused on goal alignment among participating actors at the system-level. For instance, in this case the feasibility studies helped actors to align their goals and discover the value of adding luxury residential condominiums and apartments above the commercial complex. The aligned goal of adding housing enhanced both project’s financial performance for lead actors, but also benefitted the members of the platform with new housing for end-users, increased customer-base for real estate and business owners,

and more work for construction companies. One office-bearer described this: “Soon after when I started, we together conducted and shared several studies about the future development of Tapiola”. A consultant continued on this: “The feasibility studies done through TAD brought the housing into the equation, which made [the future development] possible”.

The platform’s actors decided to engage in two other activities that shared ownership and distributed decision-making. First, the City of Espoo’s project manager wrote 24 proposals for Tapiola’s future development and shared them with all of the platform actors in order to create a basis for joint activities and common direction. The proposals provided evidence for how the new development agenda would integrate the historical and architectural heritage values with modern business development establishing a system-level goal with synergetic project outcomes for both production and consumer sides. This pamphlet functioned as a strict ground rule for actors to develop and match their specialized inputs together, being a crucial component of the co-evolution process. The value in this case is the content of the proposals, the system-level goal that integrates cultural heritage values with modern business development, benefitting actors from both consumer and provider sides. An architect described this: “These proposals have been kind of a framework. When we make decisions, it is easy to reflect those decisions, and whether they obey the proposals for development. If we did not have this kind of framework, then the whole development process would just flow in every direction, and we could always change the course to any direction arbitrarily. But now that we have the proposals, we have a common goal”.

Second, the City of Espoo’s project manager, the Indepro’s consultant, and HKP and SARC Architects founded a design team to integrate and arbitrate the platform actors’ distinct plans and inputs through two tools: the reference plan and master plan. The reference plan was a general-level, real-time, three-

dimensional (3D) visualization (i.e., the big picture) of the Tapiola development in several phases that could be updated based on inputs and feedback. The master plan was a more detailed version with specific designs (i.e., architecture, interfaces, actors, businesses, etc.) based on the reference planning. The joint planning activities shared ownership and decision-making to several actors who had the challenging task of integrating other actors' specialized inputs. In other words, the joint reference and master planning activities helped actors to co-evolve and reach the previously set system-level goal. One consultant described this: "If I don't exaggerate, we [representatives from SARC, HKP, Indepro, and the City of Espoo] have together invented almost everything new that is being developed here in Tapiola... We invented this so-called reference planning procedure... Then another new invention was this master planning procedure... that helped us to design [satisfactory] outcomes". Based on the analysis above, we propose:

Proposition P2: Participating actors' joint activities that share ownership and decision-making constitute actors' co-evolution that aims to establish and reach a system-level goal, which provides synergetic project outcomes for all participating actors.

4.2. Value-leveraging activities

In 2006, the cities of Helsinki and Espoo, along with the Finnish government, agreed to extend the existing metro system as part of wider capital region agreements about public transportation. The metro extension would be implemented from downtown Helsinki to the west through the City of Espoo, which announced that Tapiola center would be the location of one of the stations along the new track. The City of Espoo secured lucrative circumstances for Tapiola's development, because the new metro station enhanced the value and accessibility of existing premises substantially with increased customer flows. This enhanced accessibility and real estate appreciation strengthened the beliefs of various actors that participating in the platform will lead to both value creation for all participating actors and value capture

for themselves. That is, all actors that owned real estates and businesses in the area would be able to see that they will be able to capture a portion of the overall jointly created value. This condition legitimized their interests in investing their resources for further value-creating activities such as high-rise buildings and city center-like services and businesses that often surround metro stations and have beneficial implications to many other actors as well. A manager from one of the real estate owners said: “We see that after the metro approval there exists a possibility of developing properly, and now, of course, the possibility must be utilized. If no actor does anything, then the metro [and appreciation] comes and goes, so now is the time to react”.

The platform’s actors engaged in five other activities that enabled single actors to see that they will be able to capture a portion of the overall jointly created value, legitimizing their willingness to invest more resources in value-creating activities. These activities were connected to value regarding customer flows, safety, accessibility, cultural value, and funding. Regarding customer flows and accessibility, the City of Espoo decided in 2014 to locate and construct a brand new regional main bus terminal in the Tapiola district, which previously had only a drive-through terminal with a few lanes. The majority of regional buses would arrive or depart from this new main bus terminal, which would increase customer flows and enhance accessibility to the premises. This promoted real estate and business owners’ perception of value capture similarly as the metro station and legitimized their participation in value-creating activities. One architect described this: “The metro station and bus terminal are the essential things that operate this development, they enable that people will get [in the premises of Tapiola] in the first place”.

Concerning safety, the real estate and business owners established a centralized area surveillance and maintenance facility in 2014, to promote the safety of the Tapiola district, which benefit both real estate and business owners, but also other actors that use the district’s services, further ensuring their

willingness to invest resources in other value-creating activities. A manager from one of the real estate owners described this: “We also have this centralized maintenance and surveillance facility... for maintenance and safety aspects... [it] ameliorates the general expression of Tapiola in customers’ perspective but also helps us against vandalism”.

In terms of accessibility, the real estate owners jointly established a centralized underground parking facility and organization in 2008 that would be implemented in two phases in 2013 and 2016 with more than 2,000 parking bays. Centralized parking system with multiple connections to various actors’ business premises enable real estate appreciation and better customer flows around their businesses, but it also aids consumer side’s accessibility, benefitting many actors and enhancing their interest in investing their resources in further value-creating activities. One manager from one of the real estate owners said: “In addition to metro, this new centralized parking facility is an essential frame that enables development and I believe that it has a significant positive impact to customers’ accessibility to Tapiola and to our business”.

Regarding cultural value, the City of Espoo announced in 2012 that the new regional theater would be built in Tapiola’s center. This cultural enhancement was valuable particularly for NBA, Tapiola Guild and customers who valued and preserved the historical and cultural heritage of Tapiola. This motivated them to participate in other value-creating activities, because it was a concrete indication of how actors obey the earlier launched proposals and set system-level goal that guaranteed their value capture. The largest Finnish newspaper, Helsingin Sanomat, described this: “Espoo’s theater’s fate to be resolved: The decision about Espoo’s new theatre is to be concluded. The new place has been found in Tapiola’s cultural center”.

Regarding the funding, the City of Espoo established a funding arrangement called the Tapiola Balance Unit, which ensured that the City of Espoo would re-invest all of the capital obtained from land use and construction permit fees into Tapiola's infrastructure in the form of public infrastructure, public activities and services, and recreational activities. This funding arrangement was a concrete promise that every actor could capture value from the jointly created value, which legitimized actors' willingness for future participation. An office-bearer said: "We have this sort of balance unit arrangement allocated for Tapiola; it is a bit like a bank account. All the profits from land use fees, construction rights and plot sales from the Tapiola district are saved in that balance unit, like they were in a bank account. They are only available to be used for the development of Tapiola, for municipal engineering, public infrastructure, public services, and recreational activities. There are currently dozens of millions of money, which is available and will be invested in Tapiola for public benefits". Based on the analysis above, we propose:

Proposition P3: Megaproject's partial products, technologies and solutions that connect specific actors to certain value capture, enable actors understand that participation in value-creating activities will lead to both value capture for a single actor and value creation for the whole of all actors.

The City of Espoo engaged in tighter and focused collaboration with selected actors in order to develop leaders or coordinators that could facilitate value creation. We made three observations about the development of leader or coordinator role. First, the City of Espoo reserved some real estate area for LocalTapiola's own development (the Merituuli Road area) in 2009. This was an incentive for LocalTapiola to invest and develop more in Tapiola district by purchasing real estates and businesses in that area and developing them as new businesses. This enhanced LocalTapiola's resources and input specialization, which functions as a premise for becoming a resource-rich leader or coordinator. An office-bearer described this: "The Merituuli Road area is tentatively reserved for LocalTapiola and the SRV Group. We

haven't sold the land yet or [issued] construction permits, but this area is still reserved for their business development planning". A manager from one of the real estate owners continued on this: "First we bought the real estate and business from Sponda, then from Wereldhave, then last summer from Etola and now from Nordea, meaning that we possess all critical resources".

Second, in 2014, LocalTapiola took responsibility for developing the new main regional bus terminal on behalf of the City of Espoo since it already possessed resources to do so, and City of Espoo as a favor in return, provided a discount concerning building permit and land use fees for LocalTapiola. This reciprocal benefit strengthened both City of Espoo and LocalTapiola, and their resources. One consultant described this: "The final contract is that LocalTapiola develops the new main bus terminal on behalf of the City of Espoo but does not need to take responsibility for the administration and maintenance of the terminal in the operations phase". One manager from one of the real estate owners continued on this: "City of Espoo will pay us back for developing on their behalf and will acknowledge our [favor]".

Third, since LocalTapiola and City of Espoo acquired critical resources, they became dominant decision-makers in TAD and in other jointly established organizational bodies. This means that these two leaders or coordinators had the abilities to be able to govern and facilitate future value-creating activities. It was important that there were two coordinators, one from public sector and one from private sector so that the requirements and value of both public and private sector could be balanced and satisfied in the platform. One office-bearer said: "The role of LocalTapiola has advanced, and it is kind of the key solution to everything... Actually, this is mostly a development case between LocalTapiola and the City of Espoo. Then slowly the other actors will join in the future". Based on the above reasoning, we propose:

Proposition P4: Supporting specific actors to acquire critical resources provides these actors leader and coordinator roles with the ability to govern and facilitate value-creating activities among all participating actors in the megaproject.

The platform actors engaged in rivalry about who gets to contribute to the platform's activities. We have two examples of this: First, the design team utilized HKP Architects for managing the team and planning procedures around 2006. However, the design team realized that HKP Architects designing abilities were more suitable for specific details, such as designing the underground parking facility. Thus, the design team engaged them to design the underground parking facility. The design team concurrently promoted SARC Architects in the design team, which had different abilities in orchestrating large entities and arbitrating divergent interests (one employee held a prestigious professorship at Aalto University), to take more responsibility for managing the planning and team. This example illustrates how competition among alternative input or resource providing actors determined the most appropriate actors to participate in specific joint value-creating activities. This then enabled the designing of most synergetic solutions, because designer team possessed required specialized inputs to develop jointly specific megaproject outcomes that benefitted participating actors according to the previously set system-level goal. A consultant described this: "HKP Architects were responsible for coordinating the reference planning in the beginning... I said to [the project manager] that let us hire this architect/professor from SARC Architects instead who is capable of providing and arbitrating convincing plans and arguments... HKP Architects are more suitable now for designing the centralized underground parking facility and other things that SARC Architects are not designing here".

Second, LocalTapiola engaged Lemminkäinen as a constructor and Propdea Re-Team as a commercial consultant to develop the first part of complex, the Ainoa shopping center, in 2011. However, after

completion in 2013, LocalTapiola engaged SRV Group for implementation and invested in internal expertise by hiring a shopping center manager. LocalTapiola wanted to hire a management contractor to be responsible for supervising all later implementations, and SRV Group possessed such abilities, particularly in managing large projects, whereas Lemminkäinen was more specialized in implementation. The Propdea Re-Team had a different profile and understanding of the future direction than what LocalTapiola sought in the commercial profiling; therefore, LocalTapiola hired a shopping center manager for in-house operations because it would be easier to establish a mutual understanding. This simultaneous engagement and disengagement of actors and their specialized inputs illustrates competition among alternative resource providers and selection of most appropriate actors and resources to participate in specific value-creating activities for reaching synergetic megaproject outcomes and solutions according to previously set system-level goal. One manager described this: "Propdea Re-Team did the commercial layout and profile designing in the first phase a bit differently... Now it culminates in my role and capability of developing the commercial profile and layout forward". An office-bearer said, "The last negotiations regarding [Ainoa shopping center] were held with Lemminkäinen construction company, but now the current development negotiations have been with SRV Group". Therefore, we propose:

Proposition P5: Competition among participating actors helps to determine the most appropriate actors, resources and specialized inputs to participate in specific value-creating activities for reaching the set system-level goal.

5. Discussion

5.1. Contributions for megaproject management, and value creation in megaprojects research

Our study contributes to megaproject management and value creation in megaprojects research in two major ways. First, our findings suggest new approaches to megaproject management, increasing understanding of how megaprojects can be managed as organizational platforms, where the focus is on

value creation over the system's lifecycle. Second, applying knowledge from organizational platform research provided a new, lucrative and more overarching perspective to value creation in megaprojects research compared to existing perspectives that focus on detailed and narrow aspects of value creation.

First, our findings suggest new management approaches that show how megaprojects as organizational platforms is a perspective that can explain and expand previous research findings concerning megaproject management. Next, we discuss these contributions in detail.

Based on the findings we argue that megaprojects are managed through jointly planned and governed design principles. These design principles include independent and self-managed trajectories where actors establish inter-organizational bodies, joint routines and activities that emerge from the platform actors' interactions. Jointly established bodies and activities help actors to complement each other and develop their specialized resources in synergetic ways by sharing ownership and decision-making to reach a system-level goal. For instance, in this case, the real estate owners could not proceed timely with the early planning, and hence an idea emerged from the interactions between real estate owners to establish TAD for unifying single actors' conflicting design proposals and find a mutual agreement. Actors in TAD organized regular meetings and agreed on joint development activities that shared ownership and decision-making to get to know each other and to develop their respective specialized technologies for better complementarity. These activities in this case included for instance joint feasibility studies and 24 proposals for Tapiola's development that integrated single actors' goals eventually toward a system-level goal. Previous research on mega- and large project management suggests similar management approaches, where actors establish jointly controlled coordinating bodies and conduct joint activities that can create value (Artto et al., 2016; Matinheikki et al., 2016). Moreover, Shenhar and Holzmann (2017) argued that successful megaprojects that create value to many actors have two characteristics, a clear

strategic vision of the project's outcome and benefits that serves many actors and their goals, and total alignment between actors' goals. However, they do not provide theoretical or empirical understanding, how megaproject actors achieve such total alignment or clear strategic vision. Interestingly, our findings merge these previous research findings and introduce the concept system-level goal. In essence, actors establish jointly controlled organizational bodies and conduct joint activities that are the mechanisms to combine clear strategic vision and total alignment into a system-level goal. Instead of aligning actors' goals or reaching total alignment, the system-level goal integrates single actors' goals into a one goal for the entire system that constitutes the clear strategic vision. Previous research has also suggested that megaproject management is prescriptive and predetermined with quite standardized management approaches and strategies by one strong actor that coordinates megaproject management (Davies et al., 2009; Merrow, 2011). Interestingly and controversially, our findings here show that megaprojects are not managed completely prescriptive and predetermined nor deliberately by one actor only, but the approaches emerge from megaproject actors' interactions and actors together establish and design approaches (joint organizational bodies and joint activities) that share ownership and decision-making to many actors. These management approaches are rather independent and self-managed to deal with the complex organizational and technological dynamics of megaprojects.

Based on the findings we also argue that megaprojects are managed through value-leveraging activities. These value-leveraging activities are leading actors' coordination, competition among megaproject actors and megaproject actors' value capture that is connected to megaproject's certain partial products, technologies and solutions. Megaproject actors' value capture connected to certain outcomes provides single actors the motivation to participate and contribute into the joint activities and organizational bodies, whereas competition among actors then determine the most suitable final contributors for joint activities and organizational bodies. Leading actors coordinate and facilitate megaproject actors' value

capture and competition. For instance, in this case, City of Espoo connected Tapiola Guild and NBA to certain value capture by locating new regional theater to Tapiola district, which provided these two actors the motivation to contribute to further joint activities. Further, LocalTapiola facilitated competition among contractors Lemminkäinen and SRV who both wanted to participate in and contribute to the project. Lemminkäinen was eventually connected to construct first part of the new complex, whereas, SRV was connected to construct rest of the new complex. Previous research on mega- and large project management has shown that megaproject actors negotiate who can capture value and during these negotiations actors may find other value propositions for targeting specific actors in capturing value (Laursen, 2018), then actors assess their future value capture and choose whether it is worthwhile to participate to value-creating activities or not. Our findings here corroborate previous findings concerning the role of value capture in managing megaprojects by showing that future value capture for single actors is a necessity for single actors to find it worthwhile to participate in joint value-creating activities. However, our findings also extend this previous knowledge by showing that actors do not only negotiate future value capture among themselves, but that single actors' value capture can be coordinated and facilitated by leading actors who can connect certain value outcomes to certain actors, and thus, legitimize their participation in joint value-creating activities. Previous research also suggest that megaproject management is coordinated by a systems integrator, who coordinates other actors and integrates interdependencies among actors and megaproject's parts (Davies and Mackenzie, 2014). Interestingly and rather antithetically, our findings here show that leading actors do not coordinate other actors directly per se, but they do it indirectly by facilitating and coordinating actors' value capture and competition, which determine the most suitable actors to participate in and contribute to the joint activities and organizational bodies concerning certain megaproject's parts.

Second, applying knowledge from organizational platform research, and particularly concerning value-creating characteristics and mechanisms, allowed us to take an overarching perspective to value creation in megaprojects. The organizational platform research enabled us to introduce new concepts such as complementarity, specialization, and co-evolution and uncover their novel detailed mechanisms and conceptual interrelationships in megaprojects context about how the participating actors can create value jointly over the system's lifecycle. For instance, in this case, the real estate owners, founded over 40 jointly controlled platform-specific organizational bodies, such as Tapiola design team, the maintenance and surveillance system task force, the fire safety system committee, and the parking facility steering group that met at regular intervals and had collective and open rules. These organizational bodies brought together various actors, to solve jointly complex issues regarding certain sub-systems, such as the underground parking facility. Then, the same actors participating in these jointly governed organizational bodies conducted joint activities that share ownership and decision-making in the bodies, such as master and reference planning protocols, constituting actors' co-evolution. This co-evolution means that the participating actors enhance their specialized resource inputs to complement each other in synergetic ways to be able to overcome complex issues by establishing and reaching a system-level goal, which provides synergetic project outcomes for all actors.

When looking previous research on value creation in megaprojects as a whole, scholars have utilized several different theoretical foundations, because of their ability to explain various detailed mechanisms and parts of value creation. For instance, actor-network theory have been utilized extensively, because it can explain how network dimensions act as mediators between participating actors' activities and value creation (Laursen, 2018; Matinheikki et al., 2016). Moreover, resource-based view has been applied widely, because it can explain how different kinds of firm- and project-level resource constellations contribute to value creation (Brady et al., 2005; Davies and Mackenzie, 2014). Further integration

literature has been used to understand systems integration activities, that is, how actors integrate each other and the project's products and services that lead to value creation (Artto et al., 2016). Furthermore, stakeholder theory has been applied to understand how value is defined and perceived by different actors (Eskerod and Ang, 2017; Zhai et al., 2009). Lastly, applied transaction cost economics focuses on the costs of exchanges in value creation, that is, the benefits and sacrifices of a decision or transaction, which delineate the realized value (Ahola et al., 2008). These existing perspectives focus on detailed and narrow aspects of value creation, such as network dimensions, resources, integration, value perceptions and cost of exchange, and miss the big picture of the phenomenon over system lifecycle. Hence, we contribute to research on value creation in megaprojects by introducing organizational platform perspective as a new theoretical foundation that provides a lucrative and more overarching view on the value creation phenomenon compared to the existing theoretical foundations.

5.2. Contributions for value creation in organizational platform research

Our study has also two contributions for value creation in organizational platform research. First, our findings provide a contextual and empirical contribution, by showing empirically how the previously theoretically argued value-creating characteristics, concepts, mechanisms and their relationships unfold in megaprojects context, corroborating previous research findings. Second, our findings elaborate the relationship between competition and platform's value creation, and the relationship between value capture and value creation.

First, our study, megaprojects as organizational platforms, provided an overarching empirical work, which connected several value-creating characteristics, concepts and mechanisms from organizational platform research and scrutinized them in an empirical context of megaprojects. For instance, in this case, jointly planned and governed design principles showed how actors establish joint organizational bodies, such as

TAD, to develop their specialized resources for maximal complementarity through a co-evolution process that constituted of these actors' joint activities sharing decision-making and ownership, such as joint feasibility studies in TAD. Moreover, leading actors, such as LocalTapiola here, facilitated competition among actors, such as between Propdea Re-team and internal expertise to determine the most suitable participants for designing the new complex's commercial profile. In addition, leading actors connected certain actors to specific value capture, such as City of Espoo by establishing the Tapiola Balance Unit, which ensured a reciprocal investment from City of Espoo into Tapiola's infrastructure in the form of public infrastructure, public activities and services, and recreational activities that legitimized other actors' willingness for future participation. Previous research on value creation in organizational platform research has provided overarching theoretical and conceptual work of the relationships between concepts complementarity, specialization, co-evolution, competition, leader role and value capture (Autio and Thomas, 2014; Moore, 2006, 1996; Thomas et al., 2014). To our best knowledge, no empirical studies exist that connect all the aforementioned concepts and their relationships to an overarching work. Our findings here provide a contextual and empirical contribution, by showing empirically how the previously theoretically argued concepts and their relationships unfold in megaprojects context, corroborating previous research findings. Thus, megaprojects as an empirical context proved to be a lucrative context for providing new fine-grained empirical understanding of the nuances of value creation in organizational platforms.

Second, we found new insights concerning the relationship between competition and platform's value creation, and the relationship between value capture and value creation. For example, in this case, the design team utilized HKP Architects for managing the team and planning procedures, however, their designing abilities were more suitable for specific details, such as designing the underground parking facility. Therefore, the design team engaged them to design the underground parking facility, and

simultaneously promoted SARC Architects in the design team to take more responsibility for managing the planning and team. Previous research has provided understanding of the role of intraplatform rivalry from econometrics perspective either theoretically (Armstrong, 2006) or with quantitative examinations (Tiwana, 2015) illustrating the positive relationship between competition and platform's value-creation. Our finding here provides in-depth understanding of how competition determines the most suitable actors' and their resource inputs participation to certain value-creating activities, which then leads to better platform-level value creation. Hence, our finding here elaborates and extends the relationship between competition and platform's value creation by introducing a new mediator variable: the most suitable actors' participation to value-creating activities.

Moreover, we found that leading actors coordinate and facilitate platform actors' value capture. For instance, in this case, the lead actors established a centralized area surveillance and maintenance facility, to promote the safety of the Tapiola district. In so doing, lead actors connected other actors that use the district's services to certain value capture: to the safety of using the business premises, further ensuring their willingness to invest resources in other value-creating activities. Previous research on the role of value capture in organizational platform research has argued that actors go through a bargaining process of who can capture value (Adner and Kapoor, 2010). Our findings here extend this previous knowledge by showing that platform actors do not just bargain who can capture value, but that leading actors can coordinate and facilitate single actors' value capture and connect certain value outcomes to certain actors.

5.3. Managerial implications

This study has four significant practical implications for managers of megaprojects. First, managers ought to understand the crucial role of joint organizational bodies and joint activities in managing megaprojects.

Joint organizational bodies such as working groups or committees bring actors together to unify single actor's divergent goals, objectives and expectations about the project or about specific parts of the project, and to establish a common goal that the actors share and obey in the development. Joint activities such as co-planning tools and ground rules for development facilitate the achievement of the common goal. We advise managers to promote these kinds of joint activities and organizational bodies actively, by instigating them and inviting other actors into them, or by joining into existing ones. Second, in these joint activities and organizational bodies, it is important for managers to understand that each actor needs to see the value they will capture in future. Without the ability to see that there is value at the end for each single actor, there is no motivation for single actors to actively participate in the joint activities and form a common goal to advance with the megaproject timely. We advise managers to be transparent about the value propositions and concrete value that actors benefit from in the megaproject either as a process or as an offering, such as financial value, specific constructs and services, and new knowledge of doing or managing specific issues. Third, managers in megaprojects should realize that the joint organizational arrangements and activities do still require leadership. This means that a resource-rich actor can govern and facilitate the joint activities and encourage important decisions about which actors are engaged to which activities and when. This leadership contributes to timely progress of the megaproject, as otherwise decision-making could be prolonged. We suggest managers to support potential actors to become leaders or coordinators including their own organization. Fourth, in order to integrate effectively technologies and organizations for maximized value in megaprojects, managers should actively vary these above explained three activities throughout the megaproject.

6. Future research topics and research limitations

6.1. Further research

Our study is based on a single case, therefore, it is quite axiomatic that our findings warrant further inquiry, to test, elaborate and expand the findings by utilizing different methodologies and contextual settings. We particularly believe that software and IT system development megaprojects could be fruitful contexts for developing understanding of value-creating activities due to different contextual factors and the intangible nature of products and offerings. Moreover, further research could operationalize the concepts brought from organizational platform research for quantitative examinations. Besides this, we present suggestions concerning our findings that present detailed ideas to encourage further research in the domain of megaprojects as organizational platforms, and particularly to test and refine our findings.

The megaproject actors in our case established inter-organizational bodies, joint routines and activities that share ownership and decision-making constituting co-evolution process that ultimately reached a system-level goal. Our focus was to understand why the actors established these practices from value creation perspective, and what happened after these bodies and activities were established. Thus, we argue that the antecedents of establishing these bodies, that is, the instigative mechanisms of founding these joint organizational bodies deserve more attention in future research to elaborate our findings. For instance, by utilizing literature on integration or stakeholder engagement as a theoretical background to understand: how actors engage and integrate each other, what do they integrate exactly, and where do they engage each other (e.g. to decision-making or to something else). Moreover, we argue that the specialized resources that actors bring to these joint bodies and activities deserve further research attention to test and refine our findings. Further research could utilize resource-based view or dynamic capabilities as a theoretical framing to understand: the different actors' resource constellations, how do

actors develop them together, how do they exactly complement each other, and finally what kind of resource constellations and why are needed to establish and reach a system-level goal.

We also found that leading actors connect single actors' to certain value capture to motivate these actors to participate in value-creating activities. The megaproject actors then compete who gets to contribute to the value-creating activities eventually, which leading actors facilitate. Interestingly, our finding here shows that single actors' motives and incentive structures to participate in value-creating activities have an important role in value creation, which certainly deserves more research attention to expand our findings. For example, by utilizing work from organizational behavior literature as a theoretical background to understand: what kind of incentive structures enable actors to differentiate between single actors' value capture and value creation, and what are the motives for actors to connect specific other actors to certain value capture. Further, it is reasonable to argue that certain leaders have to be more effective and successful than others and therefore understanding the characteristics and leadership of these leaders in detail deserves future research efforts to test and refine our findings. For instance, by utilizing literature on leadership as a theoretical background to understand: what are the specific characteristics of leading actors, what kind of leadership styles lead into successful ability to govern and facilitate value-creating activities, and how do actors develop distinct leadership styles and abilities and why. Interestingly, and to our best knowledge, existing research on megaproject management has not touched upon the competition among actors as a significant mechanism for value creation. Thus, we suggest further research to look into the role of intraplatform competition in detail to elaborate our findings. For example, by utilizing competitive dynamics literature and game theory to understand: how actors decide upon and develop entry and exit strategies, how and why actors become competitors intraplatform, how interactive actors' competitive behavior unfolds intraplatform, and what is the role of coopetition and cooperation in intraplatform competition.

6.2. Research limitations

In this research, we approached value creation in megaprojects from a single case with rich qualitative interview and archival data. Therefore, we intend not to generalize our findings excessively, and hence we do not argue that our findings are applicable to all megaprojects as such. However, we argue that our findings can generalize into theory concerning management of megaprojects and value creation in megaprojects, bringing in new knowledge of the mechanisms and characteristics from organizational platform research perspective that create value in megaprojects. We also argue that our findings may apply to other urban development and construction megaprojects especially in the Occident, since some similar kind of findings have already been found in earlier research from contexts alike (e.g. Artto et al., 2016; Davies et al., 2009; Davies and Mackenzie, 2014; Laursen, 2018; Matinheikki et al., 2016).

References

- Adner, R., Kapoor, R., 2010. Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations. *Strateg. Manag. J.* 31, 306–333. <https://doi.org/10.1002/smj.821>
- Ahola, T., Laitinen, E., Kujala, J., Wikström, K., 2008. Purchasing strategies and value creation in industrial turnkey projects. *Int. J. Proj. Manag.* 26, 87–94. <https://doi.org/10.1016/j.ijproman.2007.08.008>
- Armstrong, M., 2006. Competition in two-sided markets. *RAND J. Econ.* 37, 668–691. <https://doi.org/10.1111/j.1756-2171.2006.tb00037.x>
- Artto, K., Ahola, T., Vartiainen, V., 2016. From the front end of projects to the back end of operations: Managing projects for value creation throughout the system lifecycle. *Int. J. Proj. Manag.* 34, 258–270. <https://doi.org/10.1016/j.ijproman.2015.05.003>

- Artto, K., Kujala, J., 2008. Project business as a research field. *Int. J. Manag. Proj. Bus.* 1, 469–497.
- Autio, E., Thomas, L., 2014. Innovation ecosystems, in: *The Oxford Handbook of Innovation Management*. pp. 204–228. <https://doi.org/10.1093/oxfordhb/9780199694945.013.012>
- Biernacki, P., Waldorf, D., 1981. Snowball sampling: Problems and techniques of chain referral sampling. *Sociol. Methods Res.* 10, 141–163.
- Bovet, D., Martha, J., 2000. Value nets: breaking the supply chain to unlock hidden profits. John Wiley & Sons.
- Brady, T., Davies, A., Gann, D., 2005. Creating value by delivering integrated solutions. *Int. J. Proj. Manag.* 23, 360–365. <https://doi.org/10.1016/j.ijproman.2005.01.001>
- Cusumano, M.A., Gawer, A., 2002. Platform Leadership. *MIT Sloan Manag. Rev.* 43, 51–58. <https://doi.org/10.1109/EMR.2003.1267020>
- Davies, A., 2004. Moving base into high-value integrated solutions: A value stream approach. *Ind. Corp. Chang.* 13, 727–756. <https://doi.org/10.1093/icc/dth029>
- Davies, A., Gann, D., Douglas, T., 2009. Innovation in Megaprojects: Systems Integration at London Heathrow Terminal 5. *Calif. Manage. Rev.* 51, 101–125.
- Davies, A., Mackenzie, I., 2014. Project complexity and systems integration: Constructing the London 2012 Olympics and Paralympics Games. *Int. J. Proj. Manag.* 32, 773–790. <https://doi.org/10.1016/j.ijproman.2013.10.004>
- DeFillippi, R., Sydow, J., 2016. Project Networks : Governance Choices and Paradoxical Tensions. *Proj. Manag. J.* 47, 1–12.
- Denzin, N., Lincoln, Y., 2005. *Handbook of Qualitative Research*. SAGE Publications.
- Edkins, A., Geraldi, J., Morris, P., Smith, A., 2013. Exploring the front-end of project management. *Eng. Proj. Organ. J.* 3, 71–85. <https://doi.org/10.1080/21573727.2013.775942>
- Eloranta, V., Turunen, T., 2016. Platforms in service-driven manufacturing: Leveraging complexity by

- connecting, sharing, and integrating. *Ind. Mark. Manag.* 55, 178–186.
- <https://doi.org/10.1016/j.indmarman.2015.10.003>
- Eskerod, P., Ang, K., 2017. Stakeholder Value Constructs in Megaprojects: A Long-Term Assessment Case Study. *Proj. Manag. J.* 48, 60–75. <https://doi.org/10.1177/875697281704800606>
- Eweje, J., Turner, R., Müller, R., 2012. Maximizing strategic value from megaprojects: The influence of information-feed on decision-making by the project manager. *Int. J. Proj. Manag.* 30, 639–651.
- <https://doi.org/10.1016/j.ijproman.2012.01.004>
- Flyvbjerg, B., 2014. What You Should Know About Megaprojects and Why: An Overview. *Proj. Manag. J.* 45, 6–19. <https://doi.org/10.1002/pmj>
- Gawer, A., Cusumano, M.A., 2014. Industry Platforms and Ecosystem Innovation. *J. Prod. Innov. Manag.* 31, 417–433.
- Gawer, A., Cusumano, M.A., 2008. How companies become platform leaders. *MIT Sloan Manag. Rev.* 49, 28.
- Gioia, D.A., Corley, K.G., Hamilton, A.L., 2013. Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology. *Organ. Res. Methods* 16, 15–31.
- Gulati, R., Puranam, P., Tushman, M., 2012. Meta-Organizational Design : Rethinking Design in Inter-Organizational and Community Contexts. *Strateg. Manag. J.* 33, 571–586.
- <https://doi.org/10.1002/smj.1975/abstract>
- Iansiti, M., Levien, R., 2004. Strategy as Ecology. *Harv. Bus. Rev.* 82. <https://doi.org/10.1108/eb025570>
- Jick, T., 1979. Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Adm. Sci. Q.* 24, 602–611.
- Ketokivi, M., Choi, T., 2014. Renaissance of case research as a scientific method. *J. Oper. Manag.* 32, 232–240. <https://doi.org/10.1016/j.jom.2014.03.004>
- Laursen, M., 2018. Project Networks as Constellations for Value Creation. *Proj. Manag. J.* 49, 56–70.

- Lusch, R., Nambisan, S., 2015. Service Innovation: A Service-Dominant Logic Perspective. *MIS Q.* 39, 155–175.
- Lusch, R.F., Vargo, S.L., 2014. Service-dominant logic: Premises, perspectives, possibilities. Cambridge University Press, Cambridge, UK.
- Matinheikki, J., Artto, K., Peltokorpi, A., Rajala, R., 2016. Managing inter-organizational networks for value creation in the front-end of projects. *Int. J. Proj. Manag.* 34, 1226–1241.
<https://doi.org/10.1016/j.ijproman.2016.06.003>
- Merrow, E.W., 2011. Industrial Megaprojects: Concepts, Strategies, and Practices for Success. John Wiley & Sons.
- Meyer, M., Lehnerd, A., 1997. The power of product platforms. Simon and Schuster.
- Moore, J.F., 2006. Business ecosystems and the view from the firm. *Antitrust Bull.* 51, 31–75.
- Moore, J.F., 1996. The death of competition: leadership and strategy in the age of business ecosystems. Harper Business: New York.
- Moore, J.F., 1993. Predators and prey: a new ecology of competition. *Harv. Bus. Rev.* 71, 75–86.
- Morris, P., 2013. Reconstructing Project Management Revisited: A Knowledge Perspective. *Proj. Manag. J.* 44, 6–23. <https://doi.org/10.1002/pmj>
- Morris, P.W.G., Hough, G.H., 1987. The anatomy of major projects: a study of the reality of project management.
- Nambisan, S., Sawhney, M., 2011. Orchestration Processes in Network-Centric Innovation: Evidence from the field. *Acad. Manag. Perspect.* 25, 40–57. <https://doi.org/10.5465/AMP.2011.63886529>
- Orr, R.J., Scott, W.R., Levitt, R.E., Artto, K., Kujala, J., 2011. Global projects: distinguishing features, drivers, and challenges, Global projects: Institutional and political challenges.
- Parolini, C., 1999. The value net: A tool for competitive strategy. Univerza v Mariboru.
- Peltola, T., Aarikka-Stenroos, L., Viana, E., Makinen, S., 2016. Value capture in business ecosystems for

- municipal solid waste management: Comparison between two local environments. *J. Clean. Prod.* 137, 1270–1279. <https://doi.org/10.1016/j.jclepro.2016.07.168>
- Perks, H., Kowalkowski, C., Witell, L., Gustafsson, A., 2017. Network orchestration for value platform development. *Ind. Mark. Manag.* 1–16. <https://doi.org/10.1016/j.indmarman.2017.08.002>
- Rego, M., Irigaray, H., Chaves, R., 2017. Symbolic Megaprojects: Historical Evidence of a Forgotten Dimension Marcos. *Proj. Manag. J.* 48, 17–28.
- Sergeeva, N., Zanello, C., 2018. Championing and promoting innovation in UK megaprojects. *Int. J. Proj. Manag.* 36, 1068–1081. <https://doi.org/10.1016/j.ijproman.2018.09.002>
- Shenhar, A., Holzmann, V., 2017. The Three Secrets of Megaproject Success: Clear Strategic Vision, Total Alignment, and Adapting to Complexity. *Proj. Manag. J.* 48, 29–46.
<https://doi.org/10.1177/875697281704800604>
- Siggelkow, N., 2007. Persuasion with case studies. *Acad. Manag. J.* 50, 20–24.
- Stinchcombe, A., Heimer, C., 1985. *Organization Theory and Project Management: Administering Uncertainty in Norwegian Offshore Oil*. Norwegian University Press.
- Thomas, L., Autio, E., Gann, D.M., 2014. Architectural leverage: putting platforms in context. *Acad. Manag. Perspect.* 28, 198–219. <https://doi.org/10.5465/amp.2011.0105>
- Tiwana, A., 2015. Evolutionary competition in platform ecosystems. *Inf. Syst. Res.* 26, 266–281.
- Zhai, L., Xin, Y., Cheng, C., 2009. Understanding the Value of Project Management from a Stakeholder's perspective: Case Study of Mega-project Management. *Proj. Manag. J.* 40, 99–109.
<https://doi.org/10.1002/pmj>