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ECOSYSTEMS APPROACH IN THE MANAGEMENT OF MEGAPROJECTS

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ABSTRACT

Megaprojects have unique characteristics that challenge the traditional approaches of how projects are managed. We study the management of megaprojects in their early phases, by theorizing on the ecosystems literature. Our empirical case is Tapiola project, a megaproject with the final purpose to renew the Tapiola district in the City of Espoo, in Finland. The project developed from renewal of facades of three buildings into a city center-wide regeneration plan integrating and involving multiple private and public actors and technical sub-systems such as metro, bus station, commercial center, and residential building investments in total over 3 billion euros. The evolution of the megaproject featured some key characteristics of platform ecosystems. We look at the management in the planning phase from a focal public organization's – City of Espoo's – perspective, while we acknowledge that in a continuously evolving network of multiple independent organizations, any single organization has a limited ability to influence other organizations in the network. Our research question is: How a focal organization in a megaproject can trigger the development of the project outcome toward a multi-actor platform? The findings comprise four propositions about the management of megaprojects. We suggest that instead of seeing planning phase as a constellation for designing a complex and multi-faceted outcome, its value is more in its role as developing a platform ecosystem, which enhances materialization of various innovations and value-creation logics through interactions with megaproject's broader environment. A focal organization through rather subtle and indirect management activities can facilitate the evolvement of the ecosystem in megaproject planning phase and initiate the development of a vivid innovation platform among other ecosystem participants.

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KEYWORDS

Megaproject; Network; Ecosystem; Complex system; Innovation platform.

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INTRODUCTION

An emergent perspective in the project management literature is the management of multi-organizational constellations, that are project networks (DeFillippi & Sydow, 2016) or project coalitions (Winch, 2006) formed to conduct large projects through specific activities and operations (Lundrigan et al., 2015). Continuous changes in such project networks (Artto, et al., 2016), that is flexibility and fluidity of organizations (Schreyögg & Sydow, 2010), are especially common for large public agency sponsored megaprojects in their planning phase, in which the project is subject to significant external pressures and even manipulation by citizens and other power centers in the broader stakeholder environment.

In megaprojects, the planning process of the whole technical and organizational entity takes place as co-evolution (Moore, 1993), rather than as a well-managed process towards a pre-determined goal. Such projects involve a great extent of dynamism: new organizations and interest groups are continuously entering the system while others are leaving (Artto et al., 2016; Hellgren & Stjernberg, 1995). Additionally, the boundaries of megaprojects are constantly redefined through interactions with their broader environment (Lundrigan et al., 2015). The structure of megaprojects changes as they include new actors to and exclude existing actors from the core of the megaprojects ecosystem. Such changes influence the long-term value creation and sustainability of the megaproject in its broader environment. Therefore, we argue that management of planning phase of megaprojects challenge the traditional approaches of how projects are managed.

The objective of the present study is to improve the current understanding of the management of megaprojects in their early phases, by addressing the empirical research question: *How a focal organization in a megaproject can trigger the development of the project outcome toward a multi-actor platform?* The study focuses organizationally on the most complex forms of megaprojects in their often fuzzy planning phases with rather open boundaries between the core and peripheral actors of the project network. Our empirical study is a longitudinal single case study of the Tapiola project - a megaproject with the final purpose to renew the Tapiola district in Finland's metropolitan area. In our analysis we focus in project's early phases, where the project had just started to emerge and the various organizations and interest groups began to girdle it and contribute to its development. The plan of the Tapiola project developed through an evolutionary process from a rather narrow idea to renovate couple of existing commercial buildings into a city center-wide regeneration plan integrating and involving multiple private and public actors and technical sub-systems such as metro, bus station, commercial center, and residential building investments. Our analysis is focused at micro-level, scrutinizing individuals, their

actions, purposes, intentions, and distinct events related to management of Tapiola megaproject in the planning phase.

When theorizing our empirical findings, we use literature on platform ecosystems by applying its central concepts and assumptions to megaprojects. Acknowledging the previous work that has been made on managing megaprojects and ecosystems (Flyvbjerg, Bruzelius, & Rothengatter, 2003; Gil & Tether, 2011; Lavie, 2006; Williamson & De Meyer, 2012) we explain how megaprojects can be managed effectively and how the management of megaprojects should take place. Hence, our findings contribute to the existing body of knowledge on the management of megaprojects by adopting theoretical insights from the research on business ecosystems (Moore, 1993, 1996, 2006; Thomas, et al., 2014; Thomas, et al., 2016; Thomas & Autio, 2013). We use ecosystem literature to conclude how the planning phase of the Tapiola project can be considered as an evolvement of a nascent platform ecosystem supporting materialization of various innovations and value-creation logics through interactions with megaproject's broader environment. This emerging platform had the capacity to develop itself through an evolving and self-managed process, and it finally ended up to renewal plans of the whole Tapiola district including over 3.4 billion euro investments. Based on our analysis of City of Espoo's actions to involve other participants of the ecosystem, we derive four propositions on how megaprojects in their planning phase can be managed as platform ecosystems.

This study contributes to the research on megaproject in three ways: First, the study suggests that megaprojects can be managed as co-evolving entities through rather subtle and indirect approaches. Second, supporting also selected single core members to carry out their self-initiated business development is important to enforce the specialized and complementing parts of the ecosystem. Third, the study bridges two literatures that have previously been treated as separate: megaprojects and platform ecosystems.

This paper is organized as follows. We first review the conceptual background for analysing megaprojects as ecosystems. We then discuss the previous knowledge of the issues related to managing ecosystems. Next, we describe the research design and findings from our empirical study of the Tapiola case. We conclude the paper by discussing the theoretical and managerial implications of the findings, and by suggesting themes for future research.

CONCEPTUAL BACKGROUND

MEGAPROJECTS AND ECOSYSTEMS

The boundaries of a megaproject (e.g. scope, budget, schedule, actor base) expand drastically over time (Flyvbjerg, 2014b). The boundaries are not stable but in continuous fluctuation process through interactions with their broader environment. This is manifested also by the phenomenon of core actors leaving while at the same time new members join in (Lundrigan et al., 2015). Megaproject participants have their own interests, goals, objectives and motives stemming from distinct value-creation logics, further complicating decision-making, actions and operations (Williams, et al., 2009). Even though there is a common goal of completing the project eventually, there are significant challenges in finding a common technical and

organizational solution by taking into account actors' single goals that may be contrasting (Brady, et al., 2005). Thus, megaprojects can be characterized as continuously developing systems that change throughout their life-cycle, and these changes are affected by the interactions of multiple interdependent organizations. Instead of a well-managed process towards any pre-determined joint goal, the whole entity takes place as a co-evolution process (Moore, 1993), where heterogeneous and pluralistic, yet simultaneously complementary but rival organizations contribute to the megaproject's development by capturing and creating value.

Megaprojects are continuously changing systems which often include a network of core and peripheral actors (Lundrigan et al., 2015), where core actors are included in the formal decision-making and operation processes (Iansiti & Levien, 2004). Similarly, an ecosystem is surrounded by a developing set of cross-industry organizations, institutions and individuals from both supplier and consumer side that contribute to its performance (Moore, 1993; Thomas & Autio, 2013). The coordination roles that ecosystem's participants may take include the concrete actions such as control mechanisms, socio-political legitimacy and trust which all ensure that value is fairly distributed to maintain the temporary stable state of the ecosystem (Moore, 1993, 2006). An ongoing legitimacy, reputation and trust of the megaproject or ecosystem are based upon the belief that participation in the ecosystem will lead to value creation and value capturing at a single actor as well as ecosystem level (Thomas & Autio, 2013). This will assume that an ecosystem or megaproject is greater than the sum of its parts (Cusumano & Gawer, 2002).

A business ecosystem has a broad scope that is influenced and shaped by a coordinating body (Moore, 1993) including the community of organizations, institutions and individuals that impact the various actors, such as end-users, customers, contractors, investors, competitors, suppliers, complementors, regulatory authorities, standard-setting bodies, the judiciary, and educational and research institutions (Teece, 2007). Thus, megaproject resembles a business ecosystem, as being a network of both production (e.g. contractors, owner) and consumption side (e.g. customers, end-users) actors that girdle a focal organization (Matinheikki et al., 2016a; Thomas & Autio, 2013). These social and economic actors interact through institutions and technology to co-produce offering and create value for the whole ecosystem as a whole as well as for each single actor (Lusch, et al., 2010; Matinheikki, et al., 2016). This network perspective implies a structured community with the notion that actors are embedded in a set of relationships which drive the ecosystem's performance. Hence, each actor of a megaproject just like of a business ecosystem exists in a symbiosis to each other, and co-evolve together (Iansiti & Levien, 2004; Lundrigan et al., 2015). In the symbiosis and co-evolution perspective the individual performance of various actors results from the overall performance of the ecosystem (Thomas & Autio, 2013) or megaproject (Matinheikki et al., 2016b). This implies that all the actors of a megaproject or business ecosystem ultimately share the destiny of the network as whole, regardless of each actor's strengths or resources (Iansiti & Levien, 2004).

Participant symbiosis in an ecosystem is driven by three elements. The first is that the participants are specialized and each provides a particular input that enables the system in the first place (Thomas & Autio, 2013). A similar characteristic in

megaprojects exists since distinct organizations have specific roles and responsibility areas that are the required inputs (e.g. contractor, designer, owner) for the megaproject and its ultimate performance (Morris, 1994). A second element is that each participant is complementary in that they are not only heterogeneously specialized and evolve together, but also add to the value creation through synergistic, cumulative interaction (Thomas & Autio, 2013). Similarly in megaprojects, the divergent inputs such as various subcontractors complement each other as they jointly produce an offering for main contractor which integrates them in the system (Davies & Brady, 2006). The third element is that the participants co-evolve, which denotes that they grow and develop in ways to maintain the temporary stability of the ecosystem (Moore, 1993, 2006). In megaprojects alike, the various actors learn from each other to better enact, match and develop their organizational capabilities to enhance the input complementarity for future project performance (Brady et al., 2005). Complementariness, or the synergistic and cumulative interaction between participants, is an important dimension on the symbiosis that exists between participants. As participants are heterogeneous, the creation of synergies is not achievable without complementarity (Iansiti & Levien, 2004; Moore, 1993), and where each participant is individually significant and interdependent on the other (Mouzas & Ford, 2009). Hence the complementariness between the participants provides the substance from which value is co-created (Adner & Kapoor, 2010; Iansiti & Levien, 2004). Symbiosis is also driven by co-evolution, as the participants need to develop over time sympathetically with the other participants in order to maintain stability and health of the ecosystem in the face of change. We argue that management of megaprojects could benefit from understanding these three participant symbiosis elements of the ecosystems.

HOW MEGAPROJECTS AND ECOSYSTEMS CAN BE MANAGED

The assumption of a leader implies that ecosystems and megaprojects contain a manageable network of actors (Möller & Halinen, 1999), in which the focal organization can change or emerge due to the drastic changes of the ecosystem (Moore, 1993). However, the symbiosis and co-evolution assumptions question the manageability of the whole ecosystem. Therefore, it is theorised that the leaders of business ecosystems co-envision and co-manage the coevolution among the distinct actors (Moore, 2006). This means that the lead organization administers the outlining and visualizing of the future of the ecosystem by timely engaging heterogeneous organizations to find potential complementary and specialized roles (Moore, 2006). This strives toward the temporal stability of an ecosystem by driving the collective performance of a network through the enablement of value creation and capturing (Thomas & Autio, 2013). To develop and survive, a megaproject just like business ecosystem needs to be efficient at transferring information and resources in the entire ecosystem.

In regard of value-creation, megaprojects and ecosystems are seen as dynamic and purposive networks of actors, in which the various actors create and capture value jointly toward a system-level goal, manifesting the logics of the value of networks (Allee, 2000). This indicates that opportunities enabled by a business ecosystem or megaproject are not necessarily equally distributed amongst all actors (Adner & Kapoor, 2010), for instance the influence or bargaining power of certain actors

toward the value co-creation are usually unequal. The system-level goal (Gulati, et al., 2012) emphasises explicitly and ubiquitously the role of complementary resource providers in value creation and appropriation (Jacobides, et al., 2006). The complementary resource providers for value co-creation denotes that because no single actor has all the required specialised knowledge, assets or capabilities, therefore, all the actors of the network are necessary for the whole system and its goal (Moore, 2006). The organizations are interdependent in that they are co-specialised in their inputs and complementary and synergistic in their relationships (Thomas & Autio, 2013), all which is needed for obtaining the system-level goal in the first place.

However, the various complementary actors' comprehension and capabilities to act towards the system-level goal is hindered by the divergent value-creation and institutional logics (e.g. public, for-profit, not-for-profit) of various actors (DiMaggio, 1988). This manifests that the various actors have differing views and understandings of the ecosystem itself even in highly aligned situations, which is the cause of divergent beliefs, norms, values and practices shaping the actors' cognition and behaviour (DiMaggio, 1988; Moore, 2006). Another obstacle is the competition among actors inside a business ecosystem that leads to fragmentation (Moore, 2006). This competition stems from the idea that in both megaproject networks and business ecosystems there exist multiple potential providers for any contribution (Moore, 2006; Möller & Halinen, 1999). A common goal can be achieved by emphasising collective actions or joint routines. Collective actions and joint routines mean that the separate actors of an ecosystem or megaproject work together to benefit the prevalent community, i.e. a manner similar to (quasi-)democratic communities, in which actors find ways to rally around valuable and exciting futures (Moore, 2006). Implicitly speaking, the objective of collective actions is to achieve certain relationships between the actors in a megaproject or in business ecosystem that are constituted through a shared system of values, norms, rules, beliefs and other conventions that provide the framework for value co-creation and symbiosis (Anderson, et al., 1994). This ideology of collective action is very similar to the symbiosis and co-evolution process with complementary and co-specialized roles of actors for mutual value creation and capturing.

The sustenance of a business ecosystem is gained from end-users (Thomas & Autio, 2013) and in megaprojects from the society as a whole (Flyvbjerg, 2014a). Moreover, by being transparent to the society and revealing which modules do what functions, a megaproject or business ecosystem can provide a direct link between the supplier and consumer side. Further, the value logic manifests that in megaprojects (business ecosystems) the societal (consumer) value is generated from the interaction of megaproject (ecosystem) actors in co-production (Anderson et al., 1994). An important observation is that the presence of a megaproject or business ecosystem doesn't necessarily lead instantly to value co-creation, but provides only the opportunities to do so, and it is how the actors behave and pursue the opportunities in form of collective actions, symbiosis and co-evolution with other actors that leads to value creation and capturing (Moore, 1993, 2006; Thomas & Autio, 2013). That notion opens an approach to consider megaproject as an organizational platform consisting of multiple actors in the ecosystem in which value is not predetermined but created through collective actions, symbiosis and co-evolution during the project life-cycle.

The sources of value creation through collective actions are vital to comprehend both in megaprojects and business ecosystems. Flexibility is a source of value in a megaproject or business ecosystem, where the actors are able to respond to systematic challenges and opportunities (Iansiti & Levien, 2004), this is realised through the co-specialisation and complementarity roles of actors. In this way, flexibility creates value for all actors of a megaproject, because these actors operate within a collaborative network which combines each actors' core competences (Bovet & Martha, 2000). The flexibility benefits realized through ecosystems mean that there is faster time to market, continuous awareness of changing conditions and crucially, the ability to identify and remove partners (Thomas & Autio, 2013). Similarly, flexibility enables group of collaborators to exploit a specific opportunity (Bovet & Martha, 2000). At a single organizational level, ecosystems are also a source of flexible opportunity as they potentially allow access to information, resources, markets, and technologies (Thomas & Autio, 2013). In addition, this flexibility allows the sharing of risks and outsourcing value chain stages and organizational functions (Thomas & Autio, 2013). Efficiency is a source of value, particularly echoed in transaction cost and transaction exchange perspectives (Williamson, 1975). Efficiency is key for the interlinking of activities and the leveraging of resources (Anderson et al., 1994), which manifest the collective actions and reaching the system-level goal. Innovation acts as a source of value as it is distributed across distinct actors in the ecosystem, leading to scalability, an accelerated development lifecycle, and third party support (Thomas & Autio, 2013). This drives not only individual actor innovation, but also the ecosystem or megaproject level innovation (Cusumano & Gawer, 2002). Finally, value appropriation within megaprojects or ecosystems are an important element of them, as each actor must capture a sufficient proportion of the overall value to justify their participation in the first place (Iansiti & Levien, 2004), this is promoted by trust and through valuing the relationships themselves.

There is a need for a detailed understanding of the processes by which megaprojects are managed in ecosystems perspective for utilizing different sources of value through collective actions. At present, the literature mainly just implies that business ecosystems are created through a lifecycle approach (Moore, 1993), yet little is still known about how ecosystems are actually created and developed, let alone managed.

THEORETICAL CONSIDERATIONS AND CENTRAL CONCEPTS FOR THE EMPIRICAL STUDY

Based on the literature review on ecosystems and megaprojects, the central concepts for the empirical study on the management of megaprojects from ecosystems view include: innovation platform, symbiosis, co-evolution, co-specialization, complementarity, flexibility, collective action, system-level goal and value co-creation and capturing.

Furthermore, based on the ecosystems literature, we find the following notions worthwhile for the empirical analysis. Innovation platforms enable facilitation of symbiosis, co-specialization, complementarity and co-evolution among the members of the platform. The actions of a leader or focal organization in a facilitating role promote legitimacy and reputation, which commits other participants to the

ecosystem through the belief that participation, will lead to value creation and capturing. Furthermore, increasing collective action and joint routines among the members tends to increase an individual organizations willingness to invest to collaboration and development of the whole ecosystem and not just own business activities within the ecosystem.

RESEARCH DESIGN AND ANALYSIS

We employ a qualitative research strategy, since our purpose is to gain rich insight with an empirical study by focusing into its specific and unique case context and history. We implemented an inductive theory-elaborating approach (Ketokivi & Choi, 2014), in which our analysis contribute to existing literature of megaprojects and business ecosystems.

A single case study is chosen as our research design (Yin, 2013). We wanted to select a megaproject case, in which multiple heterogeneous and pluralistic organizations participated already from the early project phases. Additionally, we saw the importance of a lead organization for facilitating and orchestrating the ecosystem designing. We chose a megaproject from close proximity of our research institute – Tapiola district project (explained above), where multiple heterogeneous organizations participated in different project phases and a lead organization with a coordination role could be observed. The close proximity means that we could go and observe the project by ourselves and obtain rich public data and general comprehension of the physical aspects to support our primary research methods of semi-structured interviews. Moreover, a thorough understanding of the district and its challenging history could be obtained even prior to the actual project as being part of the close society. We also had an access to collect data from various organizations through a joint research project with a focal organization, LocalTapiola Real Estate.

Our main method was depth interviews or semi-structured interviews (Bryman & Bell, 2007), which we supported by collecting an archival of open and closed access data for triangulation purposes (Jick, 1979). We selected informants using a purposive method (Denzin & Lincoln, 2005), and we also utilized snowballing method (Biernacki & Waldorf, 1981) by interpreting and asking other relevant knowledgeable informants from the interviewees. A total of 27 semi-structured interviews were held in between 2011 and 2016 for longitudinal validity. We interviewed 9 different organizations and many different individual roles to cover a large range of different perspectives for transverse validity. The informants are listed in Table 1 below.

Table 1. List of informants interviewed for the study

Interviewee title	Interviewee organization	Interviewers (N)	Interview date (yy/mm/dd)	Interview duration (min)
Project Manager	City of Espoo	3	2011/11/7	138

Architect	Pensioner	3	2011/11/7	80
Real Estate Manager	Tapiola Real Estate	4	2011/11/11	114
Fund Manager	Tapiola Real Estate	4	, 2011/11/11	69
Head Manager of Real Estate Investment	Tapiola Real Estate	4	2011/11/11	61
Property Manager	City of Espoo	4	2011/11/14	79
Leader of Urban Planning Unit	City of Espoo	4	2011/11/14	50
Correspondent of Livelihood	City of Espoo	4	2011/11/14	79
Headquarters Manager	City of Espoo	2	2011/11/14	102
Manager of Real Estate Constructing	Tapiola Real Estate	4	2011/11/18	69
CEO	Tapiola Real Estate	2	2011/11/18	64
-	Tapiola Guild	3	2012/09/28	133
Architect	SARC Architects	4	2012/10/16	102
Department Manager and Senior Specialist	National Board of Antiquities	4	2012/10/16	105
Chairman of the Urban Planning Unit Board	City of Espoo	3	2012/11/24	60*
Project Manager	City of Espoo	3	2014/10/22	70*
Real Estate Investment Manager	Tapiola Real Estate	4	2015/09/25	77
Head Manager of Real Estate Investment	Tapiola Real Estate	4	2015/09/25	77
Manager of Real Estate Constructing	Tapiola Real Estate	3	2015/09/25	95

CEO	Tapiola Real Estate	3	2015/09/28	74
Shopping Centre Manager	Tapiola Real Estate	3	2015/09/28	82
Real Estate Manager	Tapiola Real Estate	4	2015/10/27	76
Consultant	Indepro Consultants	4	2015/11/16	93
Architect	SARC Architects	5	2015/11/17	101
Chairman of the Urban planning Unit Board	City of Espoo	1	2016/03/10	21
CEO	Western Metro Ltd.	2	2016/06/08	57
Director of the department stores in Finland and the Baltic countries	Stockmann Group	3	2016/06/21	81
* Estimated duration, interview not recorded				

Our secondary data archive contains over two hundred unique sources of newspaper articles, project reports, presentations, brochures, company reports and detailed plans, which were gathered retrospectively starting from year 2004. The secondary data is shown in Table 2 below

Table 2. List of public data sources and respective quantities

Public data source type	Quantity (N=215)
Helsingin Sanomat (leading Finnish newspaper)	64
Länsiväylä (focal newspaper in capital region)	55
Tekniikka & Talous (focal economy and tech. newspaper)	6
Talouselämä (focal economy newspaper)	2
Other newspapers	13
Project reports	16
Plans / illustrations describing the project	11
Documents / records	17
Press releases	9

Presentations / brochures	3
Written public statements	16
Records / legislations	3

The unit of analysis is Tapiola megaproject, particularly in its early phases, where the ecosystem had just started to emerge and the various organizations began to girdle it and contribute to its development. Our analysis is focused at micro-level, scrutinizing individuals, their actions, purposes, intentions, and distinct events related to management of Tapiola megaproject. To map all notable events, activities and interactions in the project we utilized thematic analysis (Corbin & Strauss, 2008). We coded the transcribed interviews inductively following the logic of grounded theory (Glaser & Strauss, 2009) in a qualitative data analysis tool of ATLAS.ti. Simultaneously we used the secondary data archive for triangulation purposes to ensure the chronological order and causality of events (Jick, 1979).

The initial coding process followed the scheme of open coding, as we first tried to develop codes from the data with the language (quotes or a simple descriptive phrase) used by the informants (Strauss & Corbin, 1998). In this phase we made a general code bank of all the relations, organizations, events, activities, actions and operations with as accurate timestamps as possible in chronological order. Next, in the second phase of our analysis, we interpreted higher order themes following the logic of axial coding (Strauss & Corbin, 1990), in which we sought differences and similarities among the different (inter)actions, events, factors, intentions and activities of different individuals and organizations identified in the open-coding phase. Here we developed management actions of City of Espoo for facilitating the project's development. Finally, we utilized the culminating process of concept development leading to theoretical saturation (Glaser & Strauss, 2009) where we investigated the existing ecosystem literature for theoretical relationships of concepts and themes describing our phenomenon under observation, which could function as overarching aggregate dimensions to our emergent empirical findings (Dubois & Gadde, 2002). In parallel to investigating relations from literature, we considered the possibility of aggregating our empirical themes inductively. In this phase we formed our final propositions on how to manage megaprojects as ecosystems.

Finally, we wrote a dense yet detailed enough chronological case history and narrative of the phases of Tapiola megaproject, which illuminates our main findings.

FINDINGS

We present the results of this study as a broad narrative concerning our case Tapiola project. In total our analysis revealed six observations on megaproject management, which are summarised in Table 3. Finally, theorizing the empirical observations from the ecosystem theory perspective led to the presentation of four propositions of the management of megaprojects as ecosystems.

THE VERY BEGINNING OF THE PROJECT – EARLY FRONT-END PHASES AND CLOSE HISTORY

The conceptualisation and need for the Tapiola project ascended in the beginning of 1990's due to the poor conditions and withering. The front-end phase included only few organizations, of which the city of Espoo was the most salient. In addition, the local residents' association (Tapiola Guild), National Board of Antiquities (NBA; Local Environmental and Cultural Bureau – government authority) and Centre for Economic Development, Transport and Environment (ELY-centre, National Environmental and Cultural Bureau – government authority) were key actors in the conceptualization and idealization of the project. The initial conceptualisation included minor changes and updates in the area, such as façade renovations, new pavements and new street lightning because of anticipation of upcoming economic recession. Moreover the NBA, ELY-centre and residents feared the ruining the garden district image inherent with historical and cultural architecture such as center tower, art museum, cultural center, center fountains (ice rink in winter), garden hotel and large park area called silk fields that were built for inhabitants to recover from war times. Nonetheless, the recession postponed the conceptualizations as all major infrastructure development had to be frozen down temporary.

In the late 90's the recession had been overcome and the conceptualizations could proceed. The rival districts in city of Espoo had also plans for development, which allocated City of Espoo's resources. Concurrently, the withering in Tapiola had resulted in devastating consequences. The demography was segregated including only old, conservative and wealthy inhabitants, garden and park areas were overgrown, streets and buildings were in totally poor condition and the commerce had decreased resulting in the leaving and bankruptcy of some commercial actors. The need for development of Tapiola area, both in infrastructure as well in demography was an imminent must.

THE PROJECT PLANNING STARTS IN THE BEGINNING OF 21ST CENTURY

The conceptualisation and idealisation expanded in early 2000 as the local real estate owners (developers) of commercial premises in the area joined. The commerce had suffered plenty and for the sake of their business they wanted to develop the area to be more attractive for tenants, customers and end-users. The land and real estate ownership of Tapiola district had always been highly fragmented. The city of Espoo asked a unifying organ of the real estate owners, to concentrate the decision-making and ease the conceptualisation, coordination and communication, without having them to run from door to door.

In the beginning of 21st century, the real estate owners including city of Espoo *established a joint organization* Tapiola Area Development (TAD) to deal with the divergent interests of different actors in the area. The joint organization functioned as an organizational platform and the coordinating artefact for the ecosystem, meaning that it connected all heterogeneous and pluralistic yet specialized organizations together for collaboration. Moreover, this facilitated the co-evolution and symbiosis between participants in the ecosystem through active collaboration.

The joint organization enhanced mutual alignment as a voice unifying organ towards the authorities. This eased the interaction between the private and public sector actors. In addition, the TAD with joint resources represented a collective interest, vision, concept and idea of all the real estate owners in the district. This increased the trust and consensus between public and private organizations as the City of Espoo knew that the conceptualization ideas were not exploiting the advantage of only one real estate developer. Furthermore, the joint company eased the idealisation and enhanced the relationships and commitment of the real estate developers as they had a mutual channel for proposing concepts openly.

“I could claim that no development or at least in this scale as we’ve designed would have been implemented without that the focal commercial actors (real estate owners) had co-operated and formed an organ, which is the actor who pulls this project and ensemble onward and unifies the voice of fragmented ownership of the area to the city of Espoo.”

CEO of LocalTapiola Real Estate

Thereafter, the City of Espoo *conducted joint feasibility studies* with other project actors to investigate all potential boundaries and prospects of the future project. These joint activities promoted and facilitated the complementariness of various members of the ecosystem, i.e. the synergies in providing complementary organizational capabilities and comprehension for the ecosystem’s development.

These feasibility studies aided in deciphering the potential future asset and boundary and opportunity circumstances of the project, which would ease the project initiation in future. The conceptualisation shifted to concrete examinations of what could be done to the area and what were the boundaries and (dis)advantages of the area. The TAD conducted several preliminary studies through consultants seeking answers to the question of: what should be done in the area to enhance the value and attractiveness.

The city of Espoo also had their specific own feasibility studies regarding the boundaries of development, heritage preservation, infrastructure, public services and means of transportation. All these preliminary studies promoted consensus between private and public sector actors. The studies resulted in collectively addressing that Tapiola currently was not profitable and lacked an asset to guarantee a project approval of worth of investing taxpayer money. The rival districts were too close for easy accessibility, more developed and more attractive and the preservation of cultural heritage value in Tapiola was too restrictive for proper development, which could have saved the area.

“When I started in 2000, so soon after that we conducted sort of a study, which was kind of already being carried out or actually not, but we had an idea to conduct it, so called large development study of Tapiola district around 2002.”

Leader of Urban Planning Unit of city of Espoo

Since the joint feasibility studies didn’t help to solve the issues, the city of Espoo in 2005, *engaged actors to joint novel idealisation* by taking advantage of the change in

political background of local authorities. This enabled single organizations to focus on their offered specialised outputs and improve them for the ecosystem's development and for its other participants, to facilitate the complementariness and co-evolution between various actors and preparing the value capturing and creation perspectives.

This joint novel idealisation aided in forming an asset for the future project, which would legitimise the profitability and use of tax-payer money to enhance value and attractiveness. The city of Espoo realised that the development would not happen without an asset or some sort of empowering framework, which the real estate owners would grasp and exploit. Albeit the city was relatively wealthy, they couldn't develop the district by themselves with just taxpayer money. The city had to ensure the commitment of real estate owners in the potential developing project. During the beginning of 21st century, the political background of city of Espoo experienced changes and the new administration board wanted to overlook the historical preservation value, as they didn't embrace it as important.

The city of Espoo proposed to the real estate owners, if they could provide ideas and concepts of large scale development, including demolition and building of new high commercial and residential buildings. This proposal promoted commitment and consensus of actors and strengthened the relationships as actors felt useful in the conceptualisation for new ideas in overcoming the boundaries and challenges. Particularly, one real estate owner (developer), LocalTapiola Real Estate, believed and reacted to this proposal of City of Espoo by providing novel concepts and ideas of for instance tower buildings.

“The city of Espoo wished and encouraged that if we could examine that kind of possibility of developing in much bigger and fiercer scale, which surely was the starting point to these present designs. First time I heard it from the Project Manager of city of Espoo, he said that now we really have to do something big here. He had of course first discussed and agreed it with the trustees and officers of the city of Espoo.”

CEO of LocalTapiola Real Estate

In 2006, the city of Espoo *took advantage of larger scale strategy alignments* regarding overall development of capital region infrastructure. This act secured the socio-political legitimacy and reputation of the ecosystem, strengthening the belief of various participants that the participation in this ecosystem will lead to value creation and value capturing for the members, since the locus of coordination behaved accordingly.

The city of Espoo had discovered a method to secure an asset and establish empowering framework for the future project. The idealisations shifted to immense concepts of tower buildings including both commercial and residential spaces, which accelerated the development conceptualisation and engagement of other actors. The government authorities NBA and ELY-centre together with residents' association resisted the ideas, because they would not incorporate and integrate the historical garden image properly.

The strong opposition slowed down the conceptualization, which aroused city of Espoo to generate further inventions for Tapiola to survive. The former railway extension and public transportation discussions had evolved and agreements were made. The city of Espoo had secured a railway extension to Espoo region and announced that it would be implemented as a western metro line. The metro would be implemented from downtown Helsinki to the west through Espoo city, and the initial station locations included Tapiola district. The city of Espoo had guaranteed relevant circumstances for Tapiola, which would now ensure that even the value of the existing premises would increase substantially. The metro extension and station enhanced consensus on the development, that what would be the asset and advantage on which to continue build upon.

“We see that after the metro approval there exists a possibility of doing and now of course the possibility must be exploited as the metro extension comes. If no one does anything, then the metro comes and goes, so now is the time to react. It is obvious that Tapiola here has been slowly withering, regarding sales volume, number of customers or the buildings and areas.”

Real Estate Manager of LocalTapiola Real Estate

After the metro approval, between 2006 and 2007, the city of Espoo *indirectly proposed and assigned a leader role actor* for the future project that secured the initiation. This act indirectly aided in assigning a new emerging coordinator for the ecosystem – a hub-organization capable of implementing, enacting and developing a new direction for the ecosystem, which it desperately needed in the edge of a new design era. This organization had the legitimacy and reputation to behave accordingly and engage various follower participants to the ecosystem.

The future project lacked an engine actor that would have the capabilities and prestige to coordinate the project in the future. After the metro extension approval, the conceptualisation accelerated rapidly. The LocalTapiola Real Estate realised the potential in Tapiola and made preparations for own business concepts because they felt that the TAD was still too diverse in opinions of what should be done. LocalTapiola Real Estate’s solo idealisation was risky, but the possibility of a large and profitable business case was real.

LocalTapiola real estate grasped the opportunity of business case, which city of Espoo produced by requesting new concepts and ideas and securing the asset of metro extension. The reason for indirectly assigning the leader role to another actor was that the city of Espoo lacked the resources to implement the future project only by itself, but they could guide, control and influence the project to satisfy the public sector requirements in the district development. This assignment strived towards centralised decision-making and improved the open relationships and commitment between city of Espoo and LocalTapiola Real Estate.

“The role of LocalTapiola Real Estate has advanced, and it is kind of the key to the solution. It has kind of been coming up, and the plan, which has been cooking here is actually based on that. Here LocalTapiola Real Estate has its development object (Tapiola district), and it is the key to everything. Actually this is mostly the

development case between LocalTapiola Real Estate and the city of Espoo. Then slowly the other actors will join in the future.”

Project Manager of the city of Espoo

In 2007, the city of Espoo *established a mutual funding system* for the future project. This act concretised and facilitated the value-creation and value-capturing logic of the entire ecosystem. Thus, the new funding system would manifest the complementary and specialized roles of different kinds of members and how the capitalistic and social values are being delivered jointly to the ecosystem through collaborative reciprocal services.

The city of Espoo allocated a balance unit for Tapiola district which secured a way to cope with the unawareness regarding future capital, expenses and funding among project actors. This balance unit functioned as follows. The money obtained from land use fees and construction permits would be completely invested in back to the infrastructure as in forms of maintenance and development of public areas and means of transportations. As now the LocalTapiola Real Estate was committed, they could be charged with fees of construction rights and land use in the future. As a reciprocal service the charged capital would be invested back in the surrounding infrastructure as municipal engineering and public services to support their business case. This created complementarity in specializations for symbiosis and co-evolution of both technical solution and organizations. Moreover, this formed a final consensus among the actors and strengthened the open relationships particularly between LocalTapiola Real Estate and City of Espoo. The balance unit also guaranteed the realisation of proper development including the implementation of necessary public sector services, initiation of the project and entering into design phase.

“We have this sort of accounting arrangement, this balance unit arrangement, and it is allocated for Tapiola, it is a bit like a bank account. All the profits from land use fees, construction rights and plot sales from 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 and for all possible. There is currently dozens of millions of money, which is available and will be invested to Tapiola.”

Property Manager of the city of Espoo

Finally, in 2007, the city of Espoo officially announced the Tapiola project and appointed a project manager on behalf of the city for the project. The project entered into official design phase, in which the LocalTapiola Real Estate together with the city of Espoo generated several designs with various architects and consultants taking into account the government authorities’ opinions and insinuations.

SYNTHESIS OF THE FINDINGS

The synthesis of the findings is summarized in Table 3. In total we identified six separated management activities presented in the middle column of the table. The right-most column includes the sample quotes of empirical evidence related to the observed management activities. These activities included direct and indirect

management activities of the City of Espoo to influence the ecosystem and the direction of the Tapiola megaproject. These observed activities promoted co-specialization, symbiosis and co-evolution among ecosystem members for joint value creation and capturing, which all are central characteristics of platform ecosystems. In practice all this accelerated the conceptualisation and idealisation, strengthened the commitment, collaboration and relationships between the actors and strived towards sustainability. Moreover, the activities provided necessary circumstances for the future phases of project to advance towards successful launch and decision of financing.

Table 3. Findings of the study: the four propositions, related empirical observations, and sample quotes for empirical evidence

Proposition	Observed management activities	Sample quote referring to empirical evidence
P1: Establishing a joint organization of the ecosystem members with rather open rules of membership and frequent meetings among the members, helps the organizations to collectively agree about their future, and to put in place joint routines that facilitate joint innovation at the level of the whole ecosystem.	Facilitating the establishment of a joint organization Tapiola Area Development (TAD) by City of Espoo to deal with the fragmented ownership and divergent interests of different actors in the area helped the ecosystem members to agree jointly about their activities for favourable future directions. This led to self-managed coordination, collaboration, co-specialisation, and complementarity among the organizations.	<i>"I could claim that no development or at least in this scale as we've designed would have been implemented without that the focal commercial actors (real estate owners) had co-operated and formed an organ, which is the actor who pulls this project and ensemble onward and unifies the voice of fragmented ownership of the area to the city of Espoo." -CEO of LocalTapiola Real Estate</i>
P2: Making the shared ownership of the development tangible for the members of the ecosystem through sharing studies, reports, and pamphlets concerning the whole ecosystem, makes the members of the ecosystem to align their activities independently to enhance the achievement of a higher-level goal of mutual agreement.	<p>The City of Espoo together with few core ecosystem participants and the TAD initiated feasibility studies to investigate potential boundaries and prospects that could have been contained in the future of the project. These helped the participants to co-evolve in symbiosis, to develop synergies in providing complementary yet special organizational capabilities and agree about larger wholes than their self-interested business schemes.</p> <p>The individuals in the City of Espoo recognized that different ecosystem members had different perspectives and interest to develop their businesses in Tapiola, and many participants did not have a vision of the possible futures of how the Tapiola ecosystem and the context of the district could develop as a whole. Therefore, the City of Espoo decided to write down 24 theses for Tapiola's future development to serve as the basis for collective action and common direction among all members. This pamphlet increased collective action about adjusting and agreeing about developmental</p>	<p><i>"When I started in 2000, so soon after that we conducted sort of a study, which was kind of already being carried out or actually not, but we had an idea to conduct it, so called large development study of Tapiola district around 2002." - Leader of Urban Planning Unit of city of Espoo</i></p> <p><i>"So these theses have been kind of a framework. It is a certain tool, that now that we have done those theses, and after we make decisions and resolutions, it is easy to reflect those decisions and resolutions to the original these. So do these new resolutions and decisions now execute these theses that we have implemented. In a sense, if we don't have this kind of foundation, then the whole development process just flows to every directions, and we could always change</i></p>

	<p>directions, and alignment of actions of individual organizations to these directions.</p>	<p><i>the course to any direction arbitrarily. But now that we have the theses, then there's a goal, and then we can test if the new resolutions fit the theses, so in that way the theses have a big meaning. This is a completely new thing here."</i> -Architect from SARC Architects</p>
<p>P3: Enabling certain selected core private actors to develop their own core businesses individually may enforce the foundations of the ecosystem while the other actors may benefit from these core actors' involvement and thereby create tighter and more solid connections within the ecosystem.</p>	<p>The City of Espoo engaged in tighter and specifically focused collaboration with selected single core organizations to enable their development of specialized inputs and outputs that were seen beneficial for the ecosystem's development. One example is the collaboration with LocalTapiola Real Estate to enhance its investment developments in parallel to City of Espoo's own developments: these two core actors even shared the designs of same external consultants that we assigned to plan solutions.</p> <p>The City of Espoo assigned a coordinating individual for the future project activities. In this way, the city positioned itself to a role of a core organization capable of implementing, enacting and developing new directions for the ecosystem, when collectively agreed among the participants.</p>	<p><i>"The City of Espoo wished and encouraged that if we could examine that kind of possibility of developing in much bigger and fiercer scale, which surely was the starting point to these present designs. First time I heard it from the Project Manager of city of Espoo, he said that now we really have to do something big here. He had of course first discussed and agreed it with the trustees and officers of the city of Espoo."</i> -CEO of LocalTapiola Real Estate</p> <p><i>"An engine has been needed and that has been the LocalTapiola Real Estate, just without their role taking this would have never get started."</i> -Consultant of Indepro</p>
<p>P4: Timely leveraging momentum in the larger context and even creating an appropriate context with specific (funding and other) arrangements are important methods for a focal organization to ensure that the ecosystem development activities have legitimacy.</p>	<p>The City of Espoo recognized the importance of the decision of the new metro line on the other hand, and the increased need for refurbishment of the 'newer' Tapiola commercial center from the 1980s. Furthermore, the attractiveness of Tapiola for its history of a well-known garden city district and Tapiola's architectural heritage, were all factors that were considered to support for the renewal if undertaken by the members of the ecosystem. These contextual factors secured the legitimacy of the development of the ecosystem, strengthening the belief among participants that the participation will lead to value creation and value capturing for the ecosystem and its individual members.</p> <p>The City of Espoo established a funding arrangement for Tapiola project which ensured that the private investors' fees for building rights are channeled to the development of the Tapiola district's public city infrastructure, public cultural activities, and public services and recreational activities to enforce the ecosystem further specifically in the Tapiola region. This</p>	<p><i>"We see that after the metro approval there exists a possibility of doing and now of course the possibility must be exploited as the metro extension comes. If no one does anything, then the metro comes and goes, so now is the time to react. It is obvious that Tapiola here has been slowly withering, regarding sales volume, number of customers or the buildings and areas."</i> -Real Estate Manager of LocalTapiola Real Estate</p> <p><i>"We have this sort of accounting arrangement, this balance unit arrangement, and it is allocated for Tapiola, it is a bit like a bank account. All the profits from land use fees, construction rights and plot sales from</i></p>

act concretised and facilitated the value-creation and value-capturing logic of the entire ecosystem, and manifest the complementary and specialized roles of different kinds of members and how the capitalistic and social values are being delivered jointly to the ecosystem through collaborative reciprocal services.	<i>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 and for all possible. There is currently dozens of millions of money, which is available and will be invested to Tapiola."</i> -Property Manager of the city of Espoo
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Theorizing the empirical observations from the ecosystem theory perspective led to the presentation of four propositions of the management of megaprojects as ecosystems. The propositions suggest four distinct approaches for forming and managing megaprojects in planning phase as ecosystems. The first proposition describes how the joint organization functions as a platform by connecting all organizations belonging to the ecosystem. In Tapiola case, the joint organization was used to develop collaborative routines and processes for agreeing about the shared future. The second proposition describes how the shared ownership of the development is made tangible enabling co-evolution and among the members of the ecosystem. The third proposition underlines the distinct complementary and specialized roles of core organizations in the ecosystem to boost the benefits, and value creation and capturing for all member organizations. Finally, the fourth proposition suggests how the investments in the context of the ecosystem can be leveraged to increase legitimacy and reputation needed for the ecosystem development. All the propositions describe the managerial actions of a core hub-organization, The City of Espoo in our case, in a facilitating role to promote legitimacy and enhancement of the goals of the megaproject.

DISCUSSION AND CONCLUSIONS

Our findings suggest that megaprojects have similar characteristics with platform ecosystems consisting of ever changing heterogeneous and pluralistic, yet complementary, but rival cross industry organizations that change their shape continuously together with the ecosystem-level technical solution, supporting it in this process of co-evolution (Moore, 1993; Thomas & Autio, 2013).

Megaprojects have a leader or focal organization that has the primary responsibility facilitating the project over its lifecycle (DeFillippi & Sydow, 2016). Ecosystems literature has also theorized that a network of actors is coordinated by a focal organization as a coordinating body that guides the development of the ecosystem, but is not seen having a clear manager role over the entire ecosystem (Moore, 2006). Both core members that are responsible of the project planning (e.g. the City of Espoo in our case) and peripheral members who are usually less responsible of the planning, such as investors, contractors or future customers and end-users of the project in its operation phase take part in the management of the project over its lifecycle (Lundrigan et al., 2015; Winch, 2004). The actor-base of megaprojects resembles a similar idea in platform ecosystems, which cover both production side and use side participants of the technical solution (Thomas & Autio, 2013). The developed four propositions answer to the call for management of

activities and operations that reach beyond a focal organization's boundaries, the topic that has intrigued scholars and business practitioners alike (e.g. Dyer & Singh, 1998; Kapoor & Lee, 2013). As first two propositions could be relevant in all kind of megaprojects, propositions 3 and 4 underline more the role of a public agency as a coordinator in the planning phase of public sponsored megaprojects. Based on the propositions, megaprojects in their planning phase can be characterized as continuously developing ecosystems that change throughout their life-cycle, and these changes are affected by multiple interdependent organizations who are reciprocally also affected by these changes.

The megaprojects can be managed by reinforcing the partners' complementary yet specialized roles in the ecosystem, by facilitating the interaction among participants within the ecosystem, and by involving the participants in collaborative value creation and capturing through collective project management processes. Our analysis reveals the need for collaborative processes, joint organizations and joint routines to maintain the consistency of the ecosystem by managing the interactions and potential conflicts between the partners to secure the symbiosis and co-evolution of both the technical solution and related organizations.

This study contributes to the research on megaproject in three ways. First, our findings suggest that megaprojects can be managed as co-evolving entities but through rather subtle and indirect approaches: for example, the propositions suggest establishment of joint organizational bodies to help members to find out possible common futures together (P1), and using shared artefacts like reports and studies help the members to share the ownership of the whole ecosystem and to invest resources to its development (P2). This complements the previous knowledge of how megaprojects can be managed, by looking at the management in a co-evolutionary setting (Moore, 1993) where there are limitations to how much a single member participating to a project can influence others.

Second, in addition to enhancing collective action among the participants, supporting also selected single core private members to carry out their own and self-initiated business development (P3) is important to enforce the specialized and complementing parts of the ecosystem where other ecosystem members can be connected for a balanced whole with appropriate synergistic and complementing effects to ensure value creation and capturing at all levels. Similarly, public agency sponsors have role to legitimate the project and its development by connecting the megaproject to the timely investments and developments in the broader context of the project (P4). The findings elaborate the current understanding of core members and their role in megaprojects (Lundrigan et al., 2015) by revealing mechanisms through which core members create value for the whole ecosystem.

Third, this study bridges two literatures that have previously been treated as separate: megaprojects and ecosystems. The propositions increase the understanding on how megaprojects can be seen and managed as evolving platform ecosystems, which provide value to its actors through innovations and opportunities created by balancing between collective actions and activities of core members of the megaproject. The finding indicates that instead of seeing megaproject as a tool for implementing a complex and multi-faceted outcome, its value is more in its role as an

innovation platform enhancing materialization of various value-creation logics, which cannot be always predetermined or managed through hub-firms.

Our study has some limitations. As a single case study our intention is not to generalize our findings and propositions more than just analytically. Thus, they ought to be validated and tested in other contexts and with other methods, both quantitative and qualitative. Analytical generalization indicates that our propositions and findings are likely to occur in similar infrastructure megaproject or ecosystem contexts. More empirical scrutiny on megaprojects as ecosystems is proposed to advance both theoretical and practical implications development.

This study has significant implications for managers of megaprojects and related ecosystems. Understanding that management activities of megaprojects are directed to varying levels in the megaproject and its environment, including only selected core actors in the one extreme, and synergies between the megaproject and simultaneous investments in the context in the other extreme, helps a core member to balance between different management modes according to the varying needs of and opportunities for the project. If there exists disagreement about the future, an establishment of a joint organization and related joint routines among ecosystem members can facilitate collaborative development of the future vision. On the other hand, if the legitimacy of the megaproject is fragile, core member is suggested to connect the megaproject development to the investments in the larger context of the ecosystem and their timely momentum. The developed propositions provide megaproject managers practical guidelines to navigate the project towards its completion and sustainable value creation.

Our study analyzed the management of a Tapiola district megaproject in Finland and as such is limited by its context. Our case study is in-depth and rich but it focuses only on one case. Other megaprojects in other contexts might have different challenges and management approaches. As a result, high boundary conditions apply to generalization of our observations and the four propositions. Therefore, we suggest future research in different contexts for testing these propositions. We call for both quantitative research from different contextual settings testing our propositions and in-depth qualitative research identifying other possible synergies between the literatures on megaprojects and ecosystems.

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