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Published in: International Journal of Project Management

DOI: 10.1016/j.ijproman.2016.06.003

Published: 01/10/2016

Document Version Peer-reviewed accepted author manuscript, also known as Final accepted manuscript or Post-print

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Please cite the original version:

Matinheikki, J., Artto, K., Peltokorpi, A., & Rajala, R. (2016). Managing inter-organizational networks for value creation in the front-end of projects. *International Journal of Project Management*, *34*(7), 1226-1241. https://doi.org/10.1016/j.ijproman.2016.06.003

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## Title page of the paper

## Managing inter-organizational networks for value creation in the front-end of projects

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# Managing inter-organizational networks for value creation in the front-end of projects

## Abstract

Projects involve inter-organizational networks that are central to collaborative projectbased value creation. Interest in value creation in the project lifecycle is mounting, and the front-end stage of projects is gaining increasing attention in the research literature. However, little is known about how network management activities facilitate value creation in the frontend and how such activities push a project toward higher end-states of value. The purpose of this research is to identify activities that facilitate the development of inter-organizational networks and augment value creation among multiple organizations in the front-end of projects. To this end, we conduct a qualitative empirical case study of the front-end of a health care campus development project. We identify four activities and five network attributes that explain how inter-organizational network can be managed for value creation in the front-end. These findings contribute to research on management of the front-end of projects and management of inter-organizational networks in projects.

**Keywords:** front-end of projects; value creation; project management; inter-organizational networks; shared vision; front-end management

## Highlights

- A single-case study examines the front-end of a health care campus project
- The study identifies management activities for network-based value creation.
- The management activities are novel to front-end management for value creation.
- A framework depicts connection between activities and network attributes

#### 1. Introduction

Current project management research considers projects as value-adding devices that create value for the stakeholders (Morris, 2013). This view emphasizes value creation instead of creating the end-product (Winter et al., 2006). Also, it perceives projects as social rather than instrumental processes (Laursen & Svejvig, 2016). Hence, projects can be understood as networked organizational forms (Hobday, 1998) set up to create value in a collaborative setting. Value is created in the development and operations of large systems, including not just technical but also organizational complexity (Morris & Hough, 1987; Davies et al., 2005; Lenfle, 2011; Scott, Levitt, & Orr, 2011). Organizational complexity arises from different and sometimes even conflicting requirements and the needs of multiple organizations participating in a dynamic inter-organizational project network (Morris, 2004; Hellgren & Stjernberg, 1995; Ruuska et al., 2011). Aligning goals, making sacrifices, but also enhancing joint benefits for all actors are considered important determinants of value creation in the project network (Ahola et al., 2008). Traditionally, the emergence of an interorganizational project network is seen to start in the project design phase (Hellgren & Stjernberg, 1995). However, recent research has introduced a more comprehensive systems life cycle view on projects suggesting that a network starts emerging in the very early stages of a project in the so-called front-end of a project (Artto et al., 2016; Morris, 2013).

The front-end of a project is considered a strategic pre-project stage, where value creation appears in the form of goal alignment among the actors (Aaltonen et al., 2015; Edkins et al., 2013; Morris, 2013; Williams & Samset, 2010). The front-end shapes the downstream relationships within the project toward value co-production, whereby high value end-states are achieved through collaboration in an inter-organizational system (Artto et al., 2016; Davies, 2004). However, if projects should be dedicated to value creation (Winter et al., 2006), their initiation requires concrete actions or action-based entrepreneurship already in the front-end (Morris, 2013; Lundin & Söderholm, 1995). Regardless of these assumptions, we lack understanding of how management actions or activities create value

and, more importantly, what such activities are. Therefore, in this study we address the following research question: How can project management facilitate value creation through emergent inter-organizational networks in the front-end stage of projects? We focused on identifying management activities that facilitate the emergence of an inter-organizational network and inherent value creation among multiple organizations.

Because prior research includes little theoretical or empirical evidence on front-end networks and inherent network management activities, we chose an exploratory and theoryelaborating research approach (Ketokivi & Choi, 2013). In doing so, we developed an analytical research framework based on previous literature on front-end management of projects and value creation in inter-organizational networks and utilized this analytical lens in an in-depth qualitative case study of the Rehapolis health care campus development project. In the case, we analyzed retrospectively Rehapolis' front-end stage from 1998 to the investment decision in 2002 to build two campus facilities.

The paper is structured as follows. We first introduce the theoretical background on front-end management of projects and value creation in inter-organizational networks to develop an analytical framework for our theory-elaborating case study. The used method, research process, and case background are explained in the following section. Then, we present the key finding of our case study focusing on network management activities in the front-end of a project. Findings are then discussed in the light of previous literature. We conclude by summarizing the theoretical contributions and implications for practice and suggest avenues for further research.

## 2. Theoretical background

To develop an analytical framework for our empirical analysis of front-end management, we explored the existing literature on front-end management of projects and value creation in inter-organizational networks.

## 2.1. Value creation in the front-end of projects

Morris (2013) as well as Edkins and colleagues (2013) suggested that the front-end of a project is a strategic pre-project stage, in which goals, requirements, and expected value of the project are defined. Furthermore, the project is connected to the environment and to essential stakeholders' business objectives. Therefore, successful alignment of the goals and formulation of agreeable project definition are the key value-creating outcomes of the front-end stage (Morris, 2013; Edkins et al., 2013). Hence, challenges of value creation derive from the decentralized nature of the front-end, including high degrees of freedom for multiple actors requiring emergent management perspectives (Morris, 2004) and novel perspectives to decision-making to cope with the challenges of turbulent and complex project environment (Williams & Samset, 2010).

In the search for such emergent management perspectives, earlier project management research has focused on approaches associated with innovation management (Artto et al., 2011; Edkins et al., 2013), having analogies with value creation approaches in integrated solutions research such the "joint innovation with the customer" (Davies, 2004). Furthermore, innovation research describes the front-end as a fuzzy stage (Kim & Wilemon, 2002), requiring non-linear or iterative management approaches (Koen et al., 2001; Nobelius & Trygg, 2002). These non-linear management approaches in the existing project management literature are contained in project lifecycle models: For example, Morris (1994) suggested cyclical or iterative lifecycle models for projects' innovative early front-end stages. In addition, the contemporary project management standard BS6079 (2010) broadens the project lifecycle view and discusses the front-end as an early before-the-project period in the extended project lifecycle. Artto et al. (2008) made a similar notion when emphasizing the importance of the front-end stage for the ultimate business purpose and value creation in projects. Recent research (see, for example, Aaltonen et al., 2015; Williams & Samset, 2010) has argued that the dynamic complexity caused by for example project stakeholders in the early stages requires moving managerial emphasis toward stakeholder analysis and

engagement and joint sense-making, leaving traditional project management organizations and methods rather toothless.

While the proposed management approaches have proven to be valuable in project management, they tell a little about the concrete management activities in the decentralized or networked organizational context of the front-end. Previous project management research has examined project-related networks mainly as temporary organizational forms (Artto & Kujala, 2008; Hellgren & Stjernberg, 1995) for managing project delivery (Ahola et al., 2013) and project stakeholders (Aaltonen & Sivonen, 2009; Turner, 2014; Rowley, 1997). The previous project management literature is rich in theories and methods suitable for investigating the management of inter-organizational networks and stakeholders in the implementation stage of a project or achieving project goals by performing pre-defined tasks. However, the existing research has not paid sufficient attention to how emerging interorganizational networks are managed for value creation in the front-end of a project, when neither clear goals nor planned tasks exist. Based on the reviewed research on management of the front-end of a project, it is reasonable to suggest that traditional planning-based project management methods do not apply due to high levels of fuzziness and a lack of clear goals to pursue. Hence, we suggest expanding our conceptual understanding to include relevant concepts from research on networks to comprehend value creation in the front-end of projects.

## 2.2. Inter-organizational network perspective for value creation in the front-end

Projects bring together vast set of interdependent actors or organizations, who form a dynamic inter-organizational project network (Hellgren & Stjernberg, 1995; Ruuska et al., 2011). In the complex projects, the inter-organizational network starts emerging already in the front-end stage (Morris, 2004). Mapping various needs of different organizations is required to form a suitable project concept to be implemented in the following lifecycle stages (Williams & Samset, 2010; Aaltonen et al., 2015). Thus, value creation in the front-end requires mostly exchange of information and resources between the actors. This is

especially true in the innovation projects requiring integrating the efforts of multiple actors (Artto et al., 2011). Undoubtedly, innovation is in the core of value creation, which is traditionally seen as novel deployments of resources to generate new sources of value (Schumpeter, 1934). When considering uniqueness of projects (Turner & Müller, 2003), some level of innovation in the front-end seems rather mandatory to get things done and project started or in other words to create value. Therefore, resource and information exchange in the emerging network play key roles in value creation by enabling mapping and compiling the divergent requirements into viable project definition required to move forward towards higher value end-states.

Research on social and business networks has shown that networks are sources of diverse information (Granovetter, 1985), novel resources (Gnyawali & Madhavan, 2001) and that they can enable efficient knowledge transfer (Uzzi, 1997) and facilitate organizational learning (Barringer & Harrison, 2000). Therefore, networks can be utilized for value creation through various means such as by facilitating innovation in intrafirm networks (Tsai & Ghoshal, 1998), by increasing managerial performance (Moran, 2005), or firm's performance in providing customer-specific solution (Frankenberger et al., 2013) and by efficiently managing buyer-supplier relationships (Villena et al, 2011). Despite their differences, these studies suggest that networks of relationships constitute a valuable resource for conducting diverse tasks, achieving differing goals or coping with the same challenges as in the frontend of projects. The previous research has labeled the embedded value of network of relationships as social capital which is typically operationalized through three dimensions: structural, relational and cognitive (Nahapiet & Ghoshal, 1998). The social capital seems to have a positive effect on network performance thus value creation (Tsai & Ghoshal, 1998), but also a curvilinear relationship might be possible (Villena et al., 2011) meaning that extreme embeddedness in the network can lead to negative consequences such as management biases and opportunistic behavior. Nevertheless, Nahapiet's and Ghoshal's conceptualization aims to cope with the rather abstract nature of inter-organizational or

social networks in order to tease out the factors affecting (positively or negatively) the performance of certain network.

Similarly, value creation in front-end of projects is dependent on network actors' capability to share resources and information to push project towards higher value endstates. The emergent state of the network creates challenges in the front-end management when the network represents rather weakly coupled and dynamic network (Aaltonen et al., 2015) possibly associated with low level of actor embeddedness or social capital. Therefore, in the light of previous research it seems relevant for the front-end management to focus on strengthening the network of relationships in order to improve information and resource mobility further helping actors to formulate collectively accepted project definition enabling transference into the stage of implementation. Hence, we argue that network dimensions give us better understanding of possible factors to which front-end management should focus on. We explain each dimension in detail in the following.

## 2.2.1. Structural dimension

The structural dimension measures network patterns, a hierarchy of participants, network density, and actor connectivity and centrality (Tichy et al., 1979). Understanding the structure of a network such as positions of certain firms is essential for comprehending the kinds of management activities that exist in the network. Previous research (e.g., Mohr et al., 1996; Tsai, 2002) has shown that these activities take indirect forms of management, including coordination, influencing, and integration of resources through social interactions. The centrality of an actor in a network and the density of the network (Rowley, 1997) influence the ways in which the actor can influence the interaction as well as other actors. Ibarra (1993) suggested that an actor's individual structural attributes in the network in terms of centrality of position are linked to the possibility of exercising individual power. Such attributes are also associated with innovation management and the ability to create value with other actors in the network (Dhanaraj & Parkhe, 2006).

#### 2.2.2. Relational dimension

The relationships within networks play key roles as enablers of the reciprocal and collective activity among the participants in a network (Tsai & Ghoshal, 1998). The relational dimension involves issues affecting relationships or tie strength between actors, such as trust, obligations, expectations, shared norms, and identification, that are critical in developing ties among the actors taking part in the activities in the front-end of the project. Previous research (Uzzi, 1997; Nahapiet & Ghoshal, 1998; Dekker, 2005) has emphasized that long-term ties play a key role in the formation of trust among actors and their willingness to develop the cooperation as well as building social control mechanisms augmenting value creation among the actors. The stronger the ties and the more intense the interaction, the more valuable the participants perceive the collaboration. Thus, tie strength can have a direct impact on value creation, such as knowledge and resource sharing (Lechner et al., 2010). On the other hand, weak ties might be required to create a wide network and gain access to diverse information (Granovetter, 1983).

#### 2.2.3. Cognitive dimension

Williams and Samset (2010) highlight the importance of sense-making of divergent goals and factors affecting project in the front-end stage. Each actor process the available information through their cognitive structures aiming to make sense of the surrounding on which they base their decisions and organized action (Weick et al., 2005). The cognitive dimension of the network refers to the factors that influence shared understandings, or common sense-making of the prevailing situation, among the actors in the network (Nahapiet & Ghoshal, 1998). Wasko and Faraj (2005) showed that construction of mutual understanding and building a shared vision among actors in a network requires a shared culture and shared goals. Moreover, as meaning construction is based on individual cognition, communicative interaction is necessary among the actors (Cegala, 1981). Hence, previous literature (e.g., Stubbart, 1989) suggests that forming a consensus about the objectives among the actors requires knowledge sharing about the individual perceptions of the goals in order identify divergence in the sense-making processes, as the participants

give different meanings to the goals. However, individual actors may have discrete goals and their own purposes in mind when they jointly define for example project goals.

## 2.3. Analytical framework

We combine the two presented streams of literatures on the front-end management in projects and inter-organizational networks to form a theoretical basis for our empirical research. The front-end of the project itself is seen as part of an extended project lifecycle (cf. Morris, 2013) having a strategic role as the initiating stage of the project (Edkins et al., 2013). The value creation in the early project stage includes alignment of differing goals of multiple actors in an emerging inter-organizational network through social interactions to push the project forward on its lifecycle (Aaltonen et al., 2015; Artto et al., 2016). Three dimensional view into networks can help us to better understand the factors affecting value creation and reduce the ambiguity in network management (Nahapiet & Ghoshal, 1998). From this perspective, structural, relational and cognitive attributes of the network are the key factors facilitating value creation in the front-end network.

Regardless of the introduced theoretical themes, we are still lacking understanding of concrete management activities required to manage organizationally decentralized front-end stages of projects. In addition, despite the efforts of previous research from different contexts, we do not know what are the relevant attributes or constructs within the network dimensions that can facilitate value creation in the front-end stage of a project. This leaves us to ponder: How managers can enhance value creation through each network dimension? What managers should do in order to form a value creating network? What kind of network actually should be formed? In addition, to our best knowledge there is no empirical research showing or elaborating the theoretical relation between the identified network dimensions and front-end management of the project, leaving an intriguing theoretical gap to focus on.

Our empirical research will focus on addressing these unanswered questions. Figure 1 depicts an analytical framework of the study. The figure shows that network dimensions are connected to value creation in the front-end. In addition, we argue that managers can affect the network dimensions through management activities which will shape certain network attributes. Thus, we assume that the effect of management on value creation is mediated through the network dimensions. Therefore, we have illustrated the effect of management activities with lines going via network dimensions. The management activities form the focus of our empirical research. The aim of the following theory-elaborating research is to identify the network management activities within the front-end stage which facilitate value creation through the network dimensions



Figure 1. The analytical framework for the empirical research

## 3. Research method and data

To deepen our understanding of management of inter-organizational networks and value creation in the front-end of a project, we conducted a qualitative single-case study of a Rehapolis health care campus project. The case study allowed us to gather rich evidence describing the early stages of a project that included multiple divergent organizations. In the Rehapolis project, various public and private organizations participated in the front-end of the campus development project, including idea creation and concept development (project definition) leading to financing decision and start-up of the project implementation. To address our research question, we aimed to identify key interactions and events dating even years before the beginning of project implementation. Mapping such activities helped us to

better understand how the key actors acted in the front-end to manage the emerging network and push the idea into implementation.

Instead of drawing highly generalizable conclusions, the purpose of the empirical study was to gain insight from a specific case with a unique context and history of its own. Such research strategy allowed use of an inductive theory-elaborating approach (Eisenhardt & Graebner, 2007; Ketokivi & Choi, 2014), where our analysis makes new contributions to existing theory about the front-end management of projects. Increased theoretical understanding of connection between management activities and network attributes and their impact on value creation, could then help project scholars in developing more practical front-end management methodologies.

## 3.1. Case context

Rehapolis is a joint-campus combining multiple health care organizations and locating in the City of Oulu, Northern-Finland approximately 500 km from the capital Helsinki. The campus lies in the district of Kontinkangas next to the Oulu University Hospital and Oulu University of Applied Sciences School of Health and Social Care, creating close proximity for health care operators. Rehapolis consists of two buildings comprising 8,500 m<sup>2</sup> of rented space and currently hosts 19 different actors ranging from private companies to public health care operators and non-governmental organizations (NGOs). The most of the actors operate in the field of disability health care, providing private and public assistive device and rehabilitation services.

Rehapolis is more than a physical building since it forms a common identity for the campus actors creating an inter-organizational network of local health care operators, thereby creating value for the organizations in the form of enhanced collaboration, improved business opportunities and linking single actors to the larger social and economic context of the Oulu region.

A focal actor, a private assistive device provider Prosthesis Foundation, played a key role in initiating and implementing the Rehapolis project. Prosthesis Foundation's interorganizational advisory board came up with the initial idea to co-locate multiple health care operators in the highly accessible and modern campus. Prosthesis Foundation, as a private actors, led and financed the concept development and project implementation jointly with public actors of City of Oulu and Norther Ostrobothnia Health Care District. The first Rehapolis building was financed by City of Oulu (20 % of the shares) and Prosthesis Foundation (80 % of the shares) and respectively the second building was financed by Health Care District (40 % of the shares) and Prosthesis Foundation (60 % of the shares). Idea creation and concept development began in 1998 followed by two-phased construction period of two campus buildings between 2002 and 2008. In our empirical case study, we explicitly focus on initial idea creation and concept development phases spanning approximately between 1998 and 2002. We treat this stages as the front-end of the project, which covers all informal and formal actions which led to the project definition and final investment decision.

#### 3.2. Data collection

In order to understand the networked nature and history of Rehapolis, we collected the empirical data through semi-structured interviews with representatives of sixteen different organizations. In addition, we utilized internal and open-source documentation of the Rehapolis project, such as meeting memos, project marketing presentations, blueprints, news articles and even a personal biography. Because Rehapolis can be seen as a local health care network, we wanted to map out its development history from the perspective of each health care organization within the campus. Therefore, organizations chosen for interviews had either participated in the development of Rehapolis or currently operated in the campus. The chosen informants belong to the top management and had been responsible for decisions to participate in Rehapolis, allowing us to gain knowledge about the reasons for their participation and core activities in their entry stage. In total, we conducted 26 interviews lasting between 60 and 118 minutes. We used 3 to 5 interviewers to avoid subjective data interpretation. informants listed Our are in

Table **1** in chronological order of conducted interviews with a short description of each organization as well informant's current or past role in the organization.

On the general level, we followed theoretical sampling method (Corbin & Strauss, 2014), meaning that we aimed to identify emerging concepts (the management activities and network attributes) related to the network dimensions and our analytical framework. However, due to our theory-elaborating research approach (Ketokivi & Choi, 2014), we could not completely rely on grounded theory principles. Therefore on the practical level, we chose to utilize snowball sampling (Biernacki & Waldorf, 1981) to identify our informants. This led us to perform four rounds of interviews and the informants for new rounds were chosen according to insights and needs identified in the previous rounds. We continued the interviews as long as our research group collectively felt the data saturation point was reached. This led to re-interviewing four informants due to the need for more detailed answers to questions raised by the other interviews.

In the beginning of the research process, we had very little information on Rehapolis and its history, which led us to start data collection by interviewing the largest organizations (Assistive Device Unit, Prosthesis Foundation, Medifys and Uniresta) in Rehapolis as well as the representatives of a current property owner, Orton Foundation. The first-round interviews gave us better understanding of what Rehapolis actually is and why it was built as well as helped us to start mapping the key events and activities in its development history.

In the second round we wanted more specifically focus on the development history of Rehapolis. We included the most of the organizations inside Rehapolis in order to map the entry stage of each organization. We asked the informants to describe their organizations' history in Rehapolis: how, why, and when did they initially joined the campus? We were also interested in relationships between the different organizations and how the relationships had evolved through time. After this interview round, we had gained a better understanding of the key events and activities in the development history of Rehapolis. However, to further triangulate our data and gain more in-depth data, we decided to conduct a third interview round and include persons no longer active in Rehapolis.

In the third round of interviews, we interviewed the rest of the organizations to complete our picture of Rehapolis history, but also focused explicitly on the earliest stages. The informants were mainly chosen based on the recommendations of previous informants, which led to interviewing persons already retired and no more active in Rehapolis. We asked informants to describe the early stages in their own words and to report notable events and actions by certain individuals or organizations. We also continued focusing on the relationships in this pre-project stage to map the dynamic nature and development of relationships between network actors.

In the fourth round of interviews, we mainly re-interviewed some informants we had found the most central for the whole Rehapolis as well as aimed to further complete our understanding of the case context (disability health care field).

All the interviews were recorded and transcribed, which yielded more than 30 hours of recorded material equaling over 500 pages of single spaced transcribed text. Since we researched front-end activities retrospectively, we ran the risk of confirmation and other memory-related biases due to the long time frame of activities. To avoid such biases, we utilized documents and archival data such as early PowerPoint presentations, meeting memos, and internal correspondence given to us by the informants as well as newspaper articles and other open-source publications.

No.		Informant role	Organization	Organization's main function and connection to Rehapolis
st interview round	1	Real Estate Manager	Orton Foundation	<ul> <li>Private foundation providing services for orthopedic health care, rehabilitation, scientific research, and education supply.</li> <li>Joint-owner of Rehapolis 1 &amp; 2 buildings (80% and 50% of the shares).</li> <li>Former owner of Prosthesis Foundation (until 2014). Decided on Prosthesis Foundation's investment in the project.</li> </ul>
The second interview round	2	Former Chief Executive Officer (CEO) (until late 2014)	Prosthesis Foundation	<ul> <li>Private company providing all the services for assistive devices</li> <li>During the time of the project subsidiary of Orton Foundation.</li> <li>Fully sold to multinational assistive device company in 2014</li> </ul>
	3	Service Manager	Uniresta	<ul> <li>A company providing restaurant and catering services on Rehapolis campus</li> <li>Previously took care of small facility management tasks in Rehapolis 1 such as guest reception, keys, access control etc.</li> </ul>
	4	Regional Manager	Prosthesis Foundation	See the explanation above.
	5	CEO	Medifys	<ul> <li>A private company providing various physiotherapist services</li> <li>CEO is a current chairwoman of a Rehapolis development board</li> <li>Joined Rehapolis 2 in 2010</li> </ul>
	6	Chief Operating Officer (COO)	Health Care District's Assistive Device Unit	<ul> <li>A public actor providing public assistive device services (prosthesis, walking aids etc.)</li> <li>One of the largest actors in Rehapolis.</li> <li>Formed through a merger of assistive device units of City of Oulu and Hospital District in 2009</li> </ul>
	7	CEO	Orton Foundation	See the explanation above.
	8	COO	Oulu Disabled Association	<ul> <li>An association representing disabled people</li> <li>Close collaborator with private and public service providers of assistive devices offering consultation and peer-support for disabled patients</li> </ul>
	9	CO0	Finnish Rheumatism Association	<ul> <li>An association representing and supporting rheumatic patients by offering guidance, help, and education about rheumatism</li> <li>Among the first operators in Rehapolis, since 2004</li> </ul>
	1 0	CEO	Bernafon	<ul> <li>A private company providing solutions for the hearing-impaired</li> <li>Previously a subsidiary of Prosthesis Foundation</li> <li>Among the first operators in Rehapolis, since 2004</li> </ul>
	1 1	C00	Humanopolis	<ul> <li>A private company focusing on wellness tourism and operating a rehabilitation and wellness center.</li> <li>Among the first operators in Rehapolis 1, since 2004</li> </ul>
	1 2	CEO	Tomera	<ul> <li>Private company providing various services for medical, social, and professional rehabilitation (e.g., occupational and speech therapy)</li> <li>Among the first actors in Rehapolis 2, since 2008</li> </ul>

## Table 1. List of the interviews in chronological order

The fourth interview round The third interview round	1 3	CEO	University Hospital Property Management	•	A public actor responsible for University Hospital's property investments and management Joint-owner (50% of the shares) of Rehapolis 2 building together with Orton Foundation.
	1 4	Service Manager	NewSec Property Management	•	Facility management company, which took over the facility management of Rehapolis 1 premises in 2014.
	1 5	Service Manager	Attendo Occupational Health Services	•	Private health care operator Offers occupational health care services for University Hospital Joined Rehapolis in 2010
	1 6	Former CEO (2 <sup>nd</sup> interview)	Prosthesis Foundation	•	See the explanation above.
	1 7	Regional Manager	PT–Keskus	•	Private company providing assistive devices Direct competitor of Prosthesis Foundation Regional manager was previously employed by Prosthesis Foundation Joined Rehapolis in 2010
	1 8	Former COO and former director of Rehapolis (until late 2012)	Oulu's Disabled Association	•	See the explanation above.
	1 9	CEO	BBS Oy	•	Private start-up company developing innovative bone implants Joined Rehapolis 2 in 2008
	2 0	Former Administrator (until 2009)	Prosthesis Foundation	•	See the explanation above.
	2 1	Former CEO (until late 2012)	Orton Foundation	•	See the explanation above.
	2 2	COO (2 <sup>nd</sup> interview)	Health Care District's Assistive Device Unit	•	See the explanation above.
	2 3	Regional Manager (2 <sup>nd</sup> interview)	Prosthesis Foundation	•	See the explanation above.
	2 4	COO (2 <sup>nd</sup> interview)	Oulu's Disabled Association	•	See the explanation above.
	2 5	CEO (2 <sup>nd</sup> interview)	Medifys	•	See the explanation above.
	2 6	Rehabilitation Nurse	Oulu University Hospital	•	The unit is responsible for the rehabilitation of amputated patients and coordinates the post-amputation treatment chain Not located in the campus, but closely connected to Assistive Device Unit and private service providers on operational level.

#### 3.3. Data analysis

We utilized thematic analysis (Corbin & Strauss, 2014) to sort out the interview and supportive data. In so doing, we created a chronological narrative of the main case events in the front-end. We mapped the events and activities of the front-end as expressed by our interviewees and utilized the given documents to triangulate the information on different events and phases to place them in a clear chronological order. Our empirical analysis was at the micro level. We focused on lower level entities such as activities, choices, and meanings given to activities by individuals representing various organizations.

After identifying the major case events and achieving a consensus about them within the research group, we focused on mapping the attributes of the network formed in the frontend of the project. Following a theory-elaborating research approach, we aimed to link our empirical data to existing theory (Ketokivi & Choi, 2014). For that purpose, we utilized preliminary codes and higher level categories to analyze our interview transcriptions. The codes helped us bind the previous theory to the empirical findings (Bradley et al., 2007). To formulate the preliminary coding, we used three network dimensions (structural, relational, and cognitive) to pinpoint the possible dimensions from our interview transcripts. For example, if an interviewee discussed trust between the organizations, we labelled it in the relationship dimension category for further analysis. After categorizing the findings into the principal dimensional categories, we started to inductively identify the network attributes as well as the management activities linked to the attributes.

Table 2 defines the rationale of our data analysis approach. An excerpt from the interview transcriptions is shown on the left-hand side. The excerpt is categorized according to the three network dimensions used as deductive codes in the analysis. The management activities and specific network attributes are inductively derived from the content of the interview excerpt. All the identified management activities are listed in the Results section and connected to the network attributes and three higher level network dimensions.

Table 2. Data analys	sis approach
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Quotation	Deductive code	Identified network attribute	Identified management activity
'I was a member of this	Structural	Centrality & density	Assigning the role of network
Foundation, which included representatives from the City, Hospital District, University Hospital and	Quotation discusses the members of the network and explains how it was structured.	Quotation shows that the network was created around Prosthesis Foundation ( <i>central</i> <i>actor</i> ).	leader Establishing inter- organizational coordination body
Disabled Association. We			Arranging frequent meetings
whole 1990s and pondered what we should do in the disability field and then came		Organizations still know each other well due to constant meetings, which led to a <i>dense</i> core network.	Prosthesis Foundation became a focal company when it formed the advisory board.
up with the idea on the train to Helsinki.' – Former COO of Disabled Association			Frequent board meetings facilitated social interaction in the network.

## 4. Results

Rehapolis was the first entity of its kind in Finland, combining multiple health care operators on the same campus. The project created not just the campus buildings, but also the inter-organizational network of multiple local health care organizations. The project was initiated in an advisory board of Prosthesis Foundation, a private disability health care service provider. Board included members from multiple local health care organizations and formed a core network for the idea creation and then concept development. For the convenience of the reader, we have listed the core actors of the front-end network in Table 3 and their main roles and relations in the front-end stage. In this study, we were interested in what kind of management activities these organizations used to facilitate value creation in the front-end stage, pushing the project toward implementation. The activities of the organizations are explained more in detail in the following sub-sections which are organized according to the three network dimensions of our analytical framework.

Actor	Role in the front-end			
Prosthesis Foundation	<ul> <li>Focal actor in the front-end of the Rehapolis project</li> <li>CEO founded an advisory board and started organizing quarterly board meetings in which the Rehapolis idea was born</li> <li>Strong relationships to all disability health care organizations through operations and advisory board</li> <li>Led the concept development and took a developer role in construction phase</li> </ul>			
Disabled association	<ul> <li>Another focal actor and member of the advisory board</li> <li>Former COO was politically central person who had good connections to city decision-makers</li> <li>Brought "patients' view" into Rehapolis vision</li> <li>Former COO took a responsibility on concept development together with Prosthesis Foundation COO and later on became Rehapolis Director</li> <li>Close collaboration with Prosthesis Foundation</li> </ul>			
City of Oulu	<ul> <li>Multiple decision-makers and Bureaus from the city involved</li> <li>City Hospital and Bureau of Welfare and Health care had representatives in the advisory board</li> <li>Mayor was introduced to the initial idea and gave support to the project</li> <li>City council decided to invest in Rehapolis 1 property</li> <li>City Hospital's Assistive Device Unit and Bureau of Physical Education moved into Rehapolis 1</li> </ul>			
Hospital District	<ul> <li>University Hospital (part of the Hospital District) had a representative in the advisory board</li> <li>Despite enthusiasms of individuals (orthopedics, Chairman of the Board), Hospital District's board was reluctant to join the project in the first phase because feared giving too much power to a private service provider (Prosthesis Foundation)</li> <li>Another round of persuasive negotiations and constructing Rehapolis 1 was required to build enough trust to Rehapolis concept</li> <li>Decided to invest in Rehapolis 2 with 40 % ownership</li> </ul>			
Orton Foundation	<ul> <li>Owner of Prosthesis Foundation during the time of the project</li> <li>Project sponsor, who made the major investment in both Rehapolis buildings</li> <li>Did not actively participate in the front-end, but close relationship to Prosthesis Foundation helped to convince Orton's board to accept the investment</li> </ul>			

## **Table 3.** Core actors in the front-end of the Rehapolis project

## 4.1. Structural dimension: Management activities affecting network structure

Our case findings show that Rehapolis project was initiated in the closely knit and highly interactive network of local health care organizations, gathered together in the advisory board of Prosthesis Foundation. Since the structural dimension can be understood through structural attributes such as network centralization and density, we identified three crucial management activities in the front-end of Rehapolis project affecting these attributes: Assigning network leader's role to a central organization, founding an inter-organizational coordination body and arranging constant formal and informal meetings.

The idea of Rehapolis was born in the Prosthesis Foundation's advisory board, which new CEO founded for developing Foundation's business and to get a better perspective on the disability health care field. The advisory board included representatives of the City of Oulu's Bureau of Welfare and Health Care, Oulu University Hospital (part of Hospital District), Oulu Disabled Association, Oulu County's Bureau of Welfare and Disabled War Veterans' Association. The board arranged quarterly meetings in which the members discussed management of Prosthesis Foundation, but also professional insights on trends and strategies for developing the disability health care in Oulu region.

In the 1990s, disability health care services were scattered around the city, operated in poor premises and with low level of integration between multiple service providers. During a joint excursion to a health care fair in Helsinki, the advisory board members got an idea to build a new center for disability health care as a solution to the challenges. The idea ignited the development of a Rehapolis project leading to multiple meetings between the advisory board members, city leaders, council members, and Hospital District representatives. Through formal and informal meetings, the consensus arose that Prosthesis Foundation's CEO and Disabled Association's COO (for now on referred as *the project developers*) should act as main developers to push the idea to a viable project. Both of the individuals had a central positions in the local health care and political networks, which gave them advantage in pushing the idea forward:

'Disabled Association COO and I kept the discussion [of Rehapolis] alive. Disabled Association COO is very central and well connected political person who had good relationships to the City of Oulu and nearby municipalities. Through those connections we were able to discuss with City and Hospital District leaders. Personally, I had strong connections to disability health care organizations.'

- Former CEO of Prosthesis Foundation

Centrality of the main developers clearly helped in pushing the idea forward. However, the advisory board increased density in the core network of key organizations and helped in incubating the idea in the first place. Therefore, our results indicate that assigning a project developer/leader role to central actor and forming the tightly knit core network both played important roles in the front-end value creation. Highly dense network allowed fast information flow between parties and building trust between actors, which turned out to be valuable when the project idea was pushed forwards.

# 4.2. Relational dimension: Management activities building tie strength and trust between the actors

The relational dimension helps us to understand the value of relationships between network actors. Without strong and trustful relationships, the Rehapolis idea might not been created in the first place and mutual trust was required to secure financing and attaining organizations to the campus. We identify three key management activities building trust and strengthening the inter-organizational relationships: founding the inter-organizational coordination bodies, arranging frequent informal and formal meetings and engagement of new actors in the network for concept development. Our findings indicate that frequent interorganizational meetings first in the advisory board and later in various development committees strengthened ties and trust between the organizations. In concept development phase, the engagement of new actors and empowering them to design the campus helped to build trust to new actors. Everybody was heard and seen as equally important. Strong ties and mutual trust improved the information flow and allowed faster transference to project implementation.

Before the project idea creation, the ample social interaction in the advisory board meetings helped to create personal relationships among the key actors. This lowered barriers to present the ground-breaking idea of joint-project of public and private health care actors without fear of rejection. Still, further trust building efforts were required in the concept development phase. Multiple meetings and constant lobbying were required to convince City of Oulu representatives to invest in the project.

Prosthesis Foundation hired an architect to create illustrations of Rehapolis facilities and drafted a general operation model on a power point slide. Prosthesis Foundation CEO and Disabled Association's COO used these items in lobbying, but more importantly, the initial blueprints enabled engagement of potential Rehapolis operators into concept development. The developers interviewed potential actors in the field of disability health care in order to get their input to operation model and Rehapolis premises. Taking such active and open-minded role in network development built trust in the eyes of City. Former COO of Disabled Association describes the engaging managerial approach as following:

'We had sketched the concept so that the city will participate. The mayor got really excited about the concept and he started to promote it in the city council. Then we visited all city decision-makers and presented the same things to them. Our promotion combined with the mayor's support helped us build the trustworthiness required to get the city aboard.'

– Former COO of Disabled Association

High level of trust helped to confirm the financing for the project when City of Oulu decided to invest in 20 % of shares of Rehapolis 1 property based on open book costs. The contract defined that City would buy the shares after successful project completion based on the realized costs. This highlights the mutual trust between Prosthesis Foundation and City of Oulu, when they were ready to jointly carry the project risks. The implementation method was successful shortening the project significantly when a bureaucratic public procurement process was not required.

On the other hand, lack of trust became concrete because Hospital District decided to bail out from the first campus building. Hospital District feared that co-location would bring unfair competitive advantage to Prosthesis Foundation compared to other private service operators. In addition its property management unit saw Rehapolis as a financial risk. Still, the project developers kept arranging meetings with the Hospital District leaders to argue possible benefits and to build additional trust. These meetings combined with positive feedback about Rehapolis 1 created sufficient trust between Prosthesis Foundation and Hospital District to proceed with joint construction of Rehapolis 2 with 60 % and 40 % share of ownership. CEO of Medikiinteistöt described the events as following:

'Unofficially, property management unit was not necessarily willing to join the project, because we knew that it would be so called money pit. But Hospital District's board decided that we will build it [Rehapolis 2 property]... Prosthesis Foundation was highly active in the project and building partnership. It would had been complicated to build it alone so Hospital District wanted to share the responsibility [with Prosthesis Foundation].'

– CEO of Medikiinteistöt (Medical Property)

## 4.3. Cognitive dimension: Management activities for building and sharing the vision

The cognitive dimension of the network manifested as a strong shared vision among the network actors. The vision was to increase the positive associations of disability health care, develop the services to patients with disabilities and improve their independent living. We identify two crucial management activities which helped to initiate the creation of the vision and further sharing it to the other network actors: arranging formal and informal meetings to facilitate social interaction yielding visionary ideas and engaging future operators into design process and visioning.

Disability health care experts in Prosthesis Foundation's advisory board shaped an initial idea of localized health care network. In concept development phase, Prosthesis Foundation invited other organizations to further develop the vision and operation model of Rehapolis through collaborative meetings and interviewing potential network members. Giving them the opportunity to participate in the project design helped other organizations accept and commit to the vision of Rehapolis improving their perception about the value of

the project. The shared vision helped to strengthen the network ties and build trust between the actors in the front-end, further boosting the social interactions among the actors.

The shared vision with socially acceptable intentions lowered the barriers for key participants such as the City of Oulu and Hospital District to join the project. In addition, the shared vision built trust between the actors by providing clear direction and meaning for the project and lowering the likelihood of opportunistic behavior.

## 4.4. Summary of the findings

Our empirical findings indicate that managing value creation in the front end requires different approaches than typical planning and control-based methods of project management. In contrast, front-end management requires relationship and trust building together with inter-organizational coordination, joint decision-making and shaping the differing goals to build up consensus and common vision. Early stakeholder engagement into designing seems to create value when future operators are more willing commit into the project.

We found four concrete management activities which positively affected the front-end deliverables such as idea creation and concept development as well as forming and strengthening the network required for successful investment decision and project start-up. Furthermore, we identified five network attributes which we see mediating the effect of the management activities to value creation in the front-end. We summarize these findings in Table 4. In the left-most column, we list the four network management activities, which derive from our empirical findings. The following column describes these management activities in more detail in our case context. The third column provides crude empirical data as illustrative quotations. The right-most column presents identified generic network attributes within the three network dimensions of our analytical framework. The network management activities affect these network attributes which augment value creation within the network. The attributes give us more concrete operationalization of the network dimensions.

Network management activities	Observations about specific activities	Sample evidence from the empirical data	Network attributes and linkage to the network dimensions in the analytical framework
1) Assigning a network leader role to one or a few focal	Prosthesis Foundation CEO led discussion in the advisory board     Prosthesis Foundation and Disabled	'COO of Disabled Association was a member of a political party and knew many people, he had a really strong network' - Former CEO of Prosthesis Foundation	<ul> <li>Network emerged around focal organizations of Prosthesis Foundation and Disabled Association creating a highly centralized network.</li> </ul>
organizations in the network	Association were given the responsibility to develop the initial idea of Rehapolis into a feasible concept and market the concept to various stakeholders.	'Former COO of Disabled Association and CEO of Prosthesis Foundation put their heads together, they had the vision how this [Rehapolis] house should look like. Prosthesis Foundation and its owner's Orton had a strong economy and COO of Disabled Association a wide political network and expertise. Those might enabled the whole project. ' – Current COO of Disabled Association	<ul> <li>Focal organizations had ties to multiple actors (investors, partners, operators and patients), giving leverage in concept development and lobbying the project.</li> <li>Network attribute: <i>high centrality</i> within the structural dimension</li> </ul>
<ol> <li>Establishing a joint coordination body among the network</li> </ol>	<ul> <li>The advisory board formed an open platform for network actors to connect and share their concerns</li> </ul>	We had this advisory board which had an important role It was this kind of discussion forum in which we started to discuss where this world is heading and what we should do.' - Former CEO of Prosthesis Foundation We met regularly throughout the whole 1990s and pondered what we should do in the disability field and then came up with the idea on the train to Helsinki.' – Former COO of Disabled Association	Core actors formed a dense network through advisory board
organizations	and visions		<ul> <li>right density helped to build trust and enabled better understanding of needs of the special health care field.</li> </ul>
	<ul> <li>The initial idea of Rehapolis was created during the shared train trip.</li> </ul>		<b>Network attributes</b> : <i>high density</i> within the structural dimension, <i>high level of trust</i> within relational dimension
3) Arranging frequent formal and informal meetings among the	<ul> <li>Quarterly advisory board meetings played important role in the idea creation.</li> </ul>	We met approximately four times per year in these advisory board meetings We discussed business figures, such as revenues, but also what is happening in the whole health care and social field They	<ul> <li>Frequent meetings facilitated the continuous social interactions well before the project existence strengthening the ties between actors.</li> </ul>
network organizations	<ul> <li>After the idea creation, multiple meetings were required to map the requirements for the project, define the common goals, and identify the most important stakeholders.</li> </ul>	[participants] were good discussion partners and therefore we met regularly.' –Former CEO of Prosthesis Foundation	<ul> <li>Through interactions the ideas and worries were shared leading to initiation of the project.</li> </ul>
		'they all had familiarized themselves with the assistive device field and all this expertise was gathered together prior to making any official decisions' —Former administrator of Prosthesis Foundation	<ul> <li>Strong ties between the advisory board members improved the consensus building and information flow inside the network.</li> </ul>
			<b>Network attributes:</b> <i>strong ties</i> and <i>trust</i> within the relational dimension and <i>shared vision</i> within cognitive dimension
4) Engaging actors from inside and	<ul> <li>The potential campus operators were given a possibility to design</li> </ul>	'Concept development was started by interviewing all these actors. For example City of Oulu, what were their expectations and wishes related to disability services in the long term? When we created the concept together, they also committed to it and saw all possibilities related to the campus.' - Former CEO of Prosthesis Foundation 'There existed democracy in those meetings. The Prosthesis Foundation as a developer did not just dictate the rules but tried to find the best solution for everyone All the things were still discussed very openly When they participated in designing they started to saw the value and benefits ' – Former administrator of Prosthesis Foundation 'We got an opportunity to design our own premises. It did not cost us any extra The COO of Disabled Association was open-minded to allow us as a poor company with uncertain financing to join the campus.' – CEO of BBS	<ul> <li>Long common history and strong ties helped building the trust between the actors.</li> </ul>
outside the network in decision-making	<ul> <li>their own premises and shape shared vision of Rehapolis</li> <li>The project developers discussed personally with all the potential actors and listened to their needs and invited them to development meetings</li> </ul>		<ul> <li>Trust was further accommodated through development meetings by engaging and empowering all the actors to campus design the campus.</li> </ul>
			<ul> <li>Shared vision was refined in the meetings together with the actors.</li> </ul>
			<ul> <li>The shared vision formed easily articulated project strategy giving the actors a legitimate reason to participate.</li> </ul>
			<b>Network attributes</b> : <i>high trust</i> within relational dimension, <i>shared vision</i> within cognitive dimension

#### 5. Discussion

This study aimed to understand management of inter-organizational network for value creation in the front-end of a project. We identified four management activities which affect network attributes within three dimensions, structural, relational and cognitive, augmenting value creation in the front-end stage. We present a framework in Figure 2 which combines our empirical findings and the analytical framework in order to provide new knowledge on front-end management of inter-organizational projects. On the left-side of the figure, we have listed the empirically derived management activities and linked them to empirically identified network attributes within the three network dimensions introduced in our analytical framework. The management activities as well as the network attributes advance our understanding on how project management can augment value creation in the front-end by highlighting what kind of networks may create value and more importantly, how managers can shape the networks through concrete activities.

As our analytical framework suggested, effect of the management activities on value creation seems to be mediated through the network attributes. This means that management activities *per se* might not create value, but they affect network attributes which create value in the front-end stage. Thus, it is important to understand what kind of activities can shape the network within the three dimensions. In addition, previous studies (Lechner et al., 2010; Frankenberger et al., 2013) have depicted that the three network dimensions are too abstract to really advance our understanding. Therefore, identification of the five explicit attributes of the front-end network by giving clear empirical evidence of what kind of networks augment value creation adds new knowledge on management of front-end of projects. Next, we discuss our findings in the light of previous literature by focusing on the management activities and their relation to the value-creating network attributes.



Figure 2. Management of inter-organizational network for value creation in front-end of projects

The first management activity highlights the importance of leading actor's centrality in the network. Previous research on inter-organizational networks suggests that centrality of actor or its strategic position and number of ties it occupies (degree centrality) is connected to power (Ibarra, 1993) and improved access to information and resources (Gnyawali & Madhavan, 2001). Our findings are consistent with these views and highlight the importance of position of project developer in the emerging project network but also in wider networks. Prosthesis Foundation CEO had good connections with potential project members, which was complemented by Disabled Association COO's wide network covering also more distant political decision-makers. This does not only underline the importance of degree centrality (number of ties), but also note that positioning in a structural hole between diverse networks seems valuable in the front-end stage, a notion we share with previous social network theory (Burt, 2000; Lechner, 2010). The identified management activity to affect centrality emphasizes the importance to assign the network leader role to a central actor. In the light of previous research this might seem rather obvious, when central actors tend to be the leaders especially in so called ego-networks emerging around and orchestrated by a certain hub-firm

(Dhanaraj & Parkhe, 2006). However, in inter-organizational projects and especially in decentralized front-end stage, it might not be certain which actor should take the leading role. The front-end leader should be defined early on and the leading organization should identify its current position in emerging project network and strive for centrality by attaining new relationships also to more distant networks. Thus, a front-end leader might have to shape its behavior and strategy for the forthcoming project as suggested by Aaltonen and Sivonen (2009). Prosthesis Foundation and Disabled Association attained to compromise and negotiate with other network actors in order to build consensus on the goals instead of dictating rules and manage through power. Such compromiser role is typical in situations where the focal company has a central role in a dense network (Rowley, 1998).

Another important structural attribute in the Rehapolis project was the density of the core network. Founding the advisory board was an important management activity for building a closely knitted network of disability health care operators when actors engaged in constant social interaction in the board meetings. The dense network helped to facilitate open communication and information flow between actors, which led to the creation of the Rehapolis idea. Previous studies suggest similarly that density improves the information flow within a network (Burt, 2000) so that participants can access advantageous information (Coleman, 1990, p. 310) and share other resources such as intellectual assets and human capital (Gnyawali & Madhavan, 2001). Interestingly, high centrality and high density seems to be rather controversial attributes and is typically seen as property of small networks (Dhanaraj & Parkhe, 2006). Our findings indicate that the core network of advisory board members was dense and emerged around the central players. However, in the larger scale the network got sparser when peripheral actors were not in close interaction with each other, but the central players acted as combining links between distant actors and to gain access for example to politics not directly interested in the project, but still involved in the decisionmaking through City Council. This highlights the importance of weak ties (Granovetter, 1983). Therefore, Prosthesis Foundation CEO and Disabled Association COO were able to

utilize the both structural attributes of the emerging network giving them an advantage to push project forward. Therefore, we posit that management activities affecting both the centrality and number of ties in the network (density) seem relevant to value creation in the front-end.

The advisory board did not only affect structural attributes but also relational attributes of the network by strengthening the ties and building trust among the core network members. When considering relational attributes, we distinct between tie strength and trust (although they are strongly inter-related) because strong ties are built through time with social interaction such as the advisory board meetings, but trust building seems to additionally require mutual dependence such as pursuit towards common goals in order parties to realize the trustworthiness of each other through actions taken. In our case such divergence of the relational attributes occurred when Hospital District's decided to bail out of the project despite the long participation in the advisory board. Both frequent meetings but also engagement of new actors into designing was required in order to build adequate trust to get Hospital District to join the project. The finding highlights the importance of *relational* trust (Rousseau et al., 1998), which emerges from repeated interaction and dependability on the trustor and the trustee. Our findings endorse that building relational trust requires mechanisms such as risk taking, joint goal setting, problem solving and decision making (Das & Teng, 1998; Saxton, 1997; Uzzi, 1997). Previous research (Dekker, 2005) has also shown that joint boards and joint-decision making can help in building social control mechanisms, mainly relying on trust between actors, which might be even stronger in coordinating inter-organizational tasks than hierarchical or contractual arrangements.

We highlight the two faceted nature of the relational dimension, which should be taken into account in choosing proper management activities in the front-end. In Rehapolis case management activities such as foundation of joint coordinating body and organizing the frequent meetings set the premises for social interaction, building strong ties and accumulation of trust. In addition, more active actor engagement and joint decision making and goal sharing is required to build truly trusting relationships and push the project into implementation.

When considering these activities from project management perspective, they seem to differ greatly from traditional project management approach relying on *swift trust* (Meyerson et al., 1996), which results from pre-defined professional role structures not from careful long-term relationship building. This underlines the divergent approach of front-end management, which actually emphasizes persistent social interaction and mutual dependability well before any project. Such approach might be helpful also in the implementation phase if the cumulated trust can be harnessed to complement or even substitute the more formal governance mechanisms as suggested by Dekker (2005).

The fourth management activity, actor engagement and empowerment, did not just build trust and tie strength but had an impact in the cognitive dimension by shaping the shared vision. All network participants interpret the surrounding environment through their own cognitive perception, meaning that it is important to hear other parties in order to avoid conflict. For example Hospital District had completely differing initial attitude to the project than Prosthesis Foundation, because Hospital District feared giving too much leverage to private service providers. But when actors including Hospital District were given a possibility to engage in decision-making they were more committed and willing to join. Prosthesis Foundation did not write its own ticket, but carefully listened other actors in order to build shared vision what the project outcome should look like. This is consistent with Wasko and Faraj (2005), who suggest that perception can affect how the actors act in the network and dedicate themselves to the project or simply how motivated they are to contribute to the project's success. Also, as Stubbart (1989) noted, the actors' cognition strongly affects their assessments of what is valuable. In addition, when considering project management, Lundin and Söderholm (1995, p. 446) state that "mapping by [the] rhetoric is the basic mode of initiating temporary organizations." The rhetoric will define the situation to participants and is the carrier of actions taken throughout the project. Our case study not only highlights the

importance of cognitive dimension for front-end management, but suggests active actor engagement and empowerment into decision making as a concrete management activities aiming to develop a shared vision (or rhetoric) within cognitive dimension, which seemingly affects value creation in the front-end by lowering possible conflicts and forming network of dedicated actors.

Overall, our findings have great similarities but also clear contradictions with the classical project research perspective (cf. Lundin & Söderholm, 1995; Packendorf, 1995; Bakker, 2010). Lundin and Söderholm (1995) emphasized the importance of action-based entrepreneurship in the early project stage when the project rhetoric is mapped. Therefore, the common rhetoric further refined to project strategy is clearly a major outcome of front-end stage of a project (Morris, 2013). The challenge lies in building such common rhetoric in complex and decentralized context in which most of modern projects are embedded (Morris, 2004; Williams & Samset, 2010). Our case study sheds fresh light to front-end management and decision-making by presenting four management activities through which certain value-creating attributes of inter-organizational networks can be affected.

Despite the high contextual embeddedness of the identified activities, it is clear that front-end management should not focus on tight planning and control, but adopt much softer side of management relying on relationship and trust building. The known complexity and ambiguity of front-end stage (Williams & Samset, 2010) can be reduced through concrete activities which ultimately aim to alter leading actor's position in the network, to refine structure of the network as well as to build stronger relationships and to map the common rhetoric jointly with diverse actors. Despite, the front-end stage is a crucial part of the project, it does not necessarily share the same theoretical foundation or managerial focus as the project itself. Therefore, we need to widen our perspective and focus on better understanding the value of network of relationships which are shaped through long-term interaction far before the project initiation. We see that our current study adds new

knowledge to project management research by further clarifying the rising theme of front-end management of projects and by suggesting concrete management content.

## 6. Conclusions

In this study, we applied well established concepts from the inter-organizational networks and project management literatures to analyze the empirical case of the front-end of the Rehapolis health care campus project. In doing so, we aimed to advance the current understanding of how an inter-organizational network can be managed for value creation in the front-end stage of projects. Our findings highlight activities aimed to shape network structure, to build long-term relationships and to create consensus have a mediated effect on value creation through certain network attributes. Based on our findings and above discussion, we formulate three theoretical contributions and four implications to managers. In addition, we suggest possible avenues for future research.

## 6.1. Theoretical contributions

Our study makes three specific contributions to the research on the front-end management of projects and the management of inter-organizational networks in projects. The first contribution is the identification of management activities performed by network actors that facilitate the network emergence and inherent value creation in the front-end stage of a project. We report four key management activities: (1) assigning a network leader role to one or a few central organizations in the network, (2) establishing a joint coordination body among the network organizations, (3) arranging frequent formal and informal meetings among the network organizations, and (4) engaging internal and external actors in decision-making related to the network. These activities are novel in the literature on front-end management and show concrete means to cope with the fuzziness and complexity of the front-end. Moreover, despite the contextual embeddedness of the activities, they highlight the important distinction between front-end management and traditional project

management. The former should focus on managing the relationships between multiple companies to build consensus and form common rhetoric, which will act as solid foundation for the future project. The later should then focus more on concrete control-based management of tasks which are planned based on the project definition created in the frontend. Thus, we argue that value creation in the front-end requires management to employ a network perspective taking into account varied needs and different perspectives, not just focus on the needs of a single company or implementing tasks in the most efficient way.

This takes us to our second contribution showing the important attributes of the interorganizational network to the value creation. We identified five distinctive value-creating network attributes: (1) centrality of leading actor(s), (2) network density, (3) tie strength, (4) trust, and (5) shared vision. The attributes created value through improved information flow within the dense core network, helping to secure project finance and enabling innovative and faster project implementation method due to strong and trustful relationship, mobilizing support and resources of multiple actors to gain legitimacy to the project due to central position of the project developers and most importantly build consensus on project outcome helping divergent actors to commit to the project and perceive it valuable by forming a shared vision.

The third contribution of the study summarizes that value creation in the front-end of projects relies heavily on management of the network. More explicitly, in order to create value in the front-end, one should actively manage and affect the network attributes. From theoretical perspective, effect of management activities on value creation is mediated by the network attributes. This means that, one might not directly manage value creation, but to create value one should actively shape the network in the front-end. The network approach might seem trivial especially from the perspective of social network theory, but for project management such approach is more recent since project management tends to be task-oriented and action-based discipline. Our contributions highlight that when we look the front-end stage of projects, it is important to move the emphasis from not-yet-defined tasks to

network of relationships, but keep the focus on actions which this time aim to manage complex relationships between actors (not tasks) through rather abstract, still necessary, means aimed to build tightly knitted network of actors sharing the common vision of the future project. Our contributions rather scratched the surface on the front-end management, but provide important insights on the continuum to better understanding of how successful and value-creating projects are incubated.

#### 6.2. Managerial implications

The strategic importance of the front-end stage creates challenges not just to project managers but also for general business managers or even company executives. As discussed throughout this paper, the decentralized and fuzzy nature of the front-end stage requires identifying and aligning varying goals of divergent actors. Our general implication to the managers in project-based industries is that when considering management of early stages of projects, managers should occasionally look away from the project and focus more on non-project related activities such as trust building, positioning in the surrounding networks, and (especially after idea creation) invest in active consensus building and joint development of the idea into the project. To give more practical insights to the managers, we will open up the four empirically identified management activities from a practical point of view.

The first management activity underlines the importance of combining project developer's role with network leader's role. As in any project, it is crucial for one or a few organizations (or individuals within organizations) to take the leading role and start to push the initial idea forward. This role should be assigned to an organization with a central position within the project context instead of purely focusing on organization's technical capabilities to deliver projects. In addition, the organization should have access to diverse networks reaching distant yet powerful stakeholders such as local politics and decision-makers. The central position in the cross-road of multiple different and important interest

groups can provide better access to information, which can be crucial in incubating project ideas and building legitimacy. Managers should be constantly aware of their structural position in surrounding networks and actively influence it by building new relationships and active participation in cross-industrial development boards.

The second management activity further underlines the importance of interorganizational coordination and development bodies in facilitating value creation in the frontend. Our results suggest that even higher level managers should participate or form various external coordination bodies and networks, which can include different actors also outside focal firm's field of business. Such participation may lie outside the firm's core business but might help the firm to shed light on new profitable projects.

The third management activity aims to facilitate the interaction within the network through frequent formal and informal meetings and events. Regular long-term social interaction is a pre-requisite for strong relationships and trust among the network organizations. We recommend that managers avoid relying exclusively on formal control mechanisms and leading through contracts. Instead companies should invest resources in building relationships through the non-project activities like forming and participating crossdisciplinary development and coordination bodies. These investments will bear the fruit during both launching and implementing new project, when the actors know and trust each other.

The fourth management activity emphasizes the importance of engaging new network actors. Before the project goes into full implementation mode, several new actors may enter the inter-organizational network. It is of utmost importance for the project manager to engage these actors in the front-end stage. This can be accomplished by empowering them and giving them the chance to affect the project plan and outcome, which is easier in the early stages when the plans and vision of the project are still emerging. Early engagement also helps actors to better accept the vision, which can increase the actor-

perceived value of the project. If one is given the chance to affect a project, one is much more willing to accept and appreciate the outcome.

No project is an island and no firm can succeed in a vacuum; these are two often repeated metaphors which today's managers should take seriously. We found that the identified management activities can help managers navigate through the crossfire of requirements of multiple organizations, formulate a shared vision and common goals, and push projects forward toward higher value end-states.

## 6.3. Limitations and future research

Our research bases on elaborating current theory of front-end management through an empirical case study. The case study utilized qualitative methods and focused on a certain stage of the life cycle of a single project. Due to the exploratory nature of our study, the chosen single-case method limits the generalizability of our results such as the identified management activities. There is not guarantee that just these activities will yield a successful projects since in different project settings, different kinds of management activities might be more relevant. However, our initial aim was not to formulize a holistic and all-inclusive model, but to shed light to theory on front-end management of project. Our results can therefore generalized to theory (Yin, 2013) adding new knowledge especially on the linkages between front-end management, inter-organizational networks and value creation.

Another limitation is that, we do not explicitly evaluate how successful the presented management activities were. This stems from the subjective nature of value and due to our explorative research approach we focused on understanding management and preconditions of value creation not its outcomes *per se*. Therefore, we need to settle for noting that by actively managing certain key network attributes managers can form a network which may augment value creation (such as improved information flow, new implementation models, social control mechanisms etc.) forming a basis for successful projects. Naturally, this opens avenues for further research which should focus more explicitly showing that can

for example improved information flow within the network actually contribute to the success of the front-end stage? Such research could benefit from our framework, which could be used as a basis for developing testable hypothesis.

Another interesting avenue for future research would be clarifying the contextual biases, which our study might present. How the front-end of projects differ in more project-based industries such as complex system deliveries to health care and construction discussed here? Does role of strong project seller or system integrator decrease the need for relationship and consensus building? What is the effect of different national and institutional contexts?

Projects will not step aside as major forms of economic activity but seemingly neither does the dispersion in organizing such activities yielding complex inter-organizational projects. This dynamic and organizationally fragmented business environment forces scholars and practitioners to investigate, model, and treat networks of relationships as sources of value. Therefore, we hope that our approach to include these themes to the frontend management of projects encourages other researchers to apply such perspective to other stages of the project lifecycle and beyond that helping us to understand and manage increasingly complex inter-organizational projects toward value-creation.

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