

# DEVELOPING A NEIGHBOURHOOD: HORIZONTAL INTERDEPENDENCIES IN AN INNOVATIVE MULTI-PROJECT CONTEXT

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Construction projects are increasingly performed in inter-organizational multi-project contexts. Research on innovation in inter-organizational projects has often focused on contractual relationships, for example the vertical and adversarial relationship between client (here called developer) and contractor, or on integrating vertical supply chain relationships. There are, however, other inter-organizational relationships to consider that affect innovation. One example is major urban development initiatives, and other multi-project contexts, where several interdependent construction projects are planned and executed in sequence and parallel in a limited geographical area. This poses challenges on horizontal interdependent actors, between developers that perform their projects simultaneously and, literally, as neighbours. Therefore, the focus of this paper is on horizontal interdependencies in innovative multi-project contexts, specifically between different developers. The horizontal interdependencies are explored through theory on social capital. This focus includes historical and informal relations which develop over time, going beyond the traditional contractual, economical and vertical relationships. Based on empirical data from a longitudinal study of an urban development project including interviews with developers' representatives and observations from meetings, findings indicate that the developers have to collaborate over structures, contracts, logistics and timeframes. Findings also show that developers' collaboration largely depends on their own initiatives over time to create spaces for collaboration.

Keywords: collaboration, multi-project context, social capital, neighbourhood

## INTRODUCTION

Activities in the project-based construction industry are structured around collaboration and information sharing (Styhre 2008), both intra- and inter-organizational. In relation to this, there has been a long on-going discussion on the industry's innovativeness (see for example Karrbom Gustavsson 2018, Loosemore 2015). The temporary inter-organizational organizations, characteristic for construction, will affect innovativeness (Manning 2008) due to for example different routines (Levina 2005) and asymmetries of interests and goals (Cabrera and Cabrera 2002). In other words, the inter-organizational relationships, which are central in the project-based construction industry, seem to play an important role in creating an innovative context. Research on the inter-organizational aspects in the construction industry has mainly been studied from a transactional perspective focused on the

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contractual relationships. The vertical and adversarial relationship between client and contractor when studying project partnering (see for example Eriksson 2015) and the integration of vertical relationships between client, consultant, contractor and sub-contractor in supply chain management (see for example Vrijhoef and Koskela 2000) are two examples.

A consequence of the on-going urbanization, construction projects are more likely to be performed in multi-project contexts. Performing projects in a multi-project context raises a number of issues; project interdependencies, priority setting and resource re-allocation, competition between projects and short problem solving (Engwall and Jerbrant 2003). Engwall and Jerbrant (2003) suggested that resource allocation needed most attention in intra-organizational multi-project contexts, when the context becomes inter-organizational other issues might become more relevant. One example of such inter-organizational multi-project context is urban development projects where different developers build side by side. Hence, an innovative urban development context will involve and affect many different organizations and actors (Smith 2016), creating interdependencies between construction projects. When exploring innovative multi-project contexts other relationships than the contractual and vertical stands out, namely the horizontal relationships between parallel and sequential projects in the same context, performed by different developers. In urban development, these horizontal relationships often start of as informal and are generally not self-chosen. Instead, the initiator of the urban development project, e.g. a municipality, has decided which developer should build what and where. These prerequisites create horizontal interdependencies between the different developers.

Clients (from here on called developers) are identified as a bridging actor to serve the collaboration for innovation (Kulatunga *et al.*, 2011). The inter-organizational network becomes important when innovation moves from a single project to a multi-project context (Bygballe and Ingemansson 2014). Such innovative context often requires tight communication (Eriksson and Szentes 2017) and negotiation of boundaries (Karrbom Gustavsson 2018). In multi-project context a tight communication between the different developers is therefore important to bridge the divide between the different organizations and projects. In this paper we will focus on the horizontal interdependencies between developers performing construction projects in parallel next to each other within a limited area. In other words, as neighbours, being immediately adjoining or relatively near one another, in what is planned to be an innovative and sustainable city.

One way to study informal relationships within communities is from the lens of social capital, describing the importance of networks of relationships as a source of competitive advantage (Bourdieu 1985). Social capital, contrary to economic and human capital, relies on the structure of relationships to other individuals or corporate actor (Portes 1998). Social capital in the construction industry has been scarcely research, where the few studies have focused on social capital intra-organizationally within a certain workforce (Bresnen *et al.*, 2005, Styhre 2008) or in single projects (Di Vincenzo and Mascia 2012). As Subramaniam and Youndt point out, social capital comes from “the interactions among individuals and their networks of interrelationships” (2005: 451). To a large extent the project-based nature and often multi-project context of the construction industry creates and rely on inter-organizational relationships, therefore the social capital in those relationships becomes important to understand.

In the case presented here a municipality has created horizontal interdependencies between appointed developers due to shared prerequisites. With a starting point in theories on communities, social capital will help explain these horizontal interdependencies between the neighbouring developers in the innovative multi-project context. Where the purpose is to increase the knowledge of horizontal interdependencies in innovative multi-project contexts by exploring what social capital have been built up between the developers in order to handle these interdependencies. Based on this, the research questions are; what horizontal interdependencies have the developers handled when performing construction projects in an innovative multi-project context and what social capital have the developers built up in order to handle the horizontal interdependencies? These questions have been explored by combining theory on social capital with a longitudinal study of three clients performing construction projects in parallel within the same urban development project.

## **THEORETICAL FRAMEWORK**

### **Social Capital and Neighbours**

The term social capital evolved from community studies on networks developing over time in order for individuals and groups to survive and function in a neighbourhood (Nahapiet and Ghoshal 1998). Over the past decades many definitions and understandings of social capital have been developed, they all share the view that the networks in which individuals and groups are embedded in are important for competitive advantage (Bresnen *et al.*, 2005). To the contrary of other types of capital, e.g. human or physical, social capital exists in the structure of relationships between actors, rather than within individuals or in tangible objects (Coleman 1988, Portes 1998). Social capital is not owned by one actor, it is jointly held by the parties included in the relationship (Burt 1997). Due to the focus on relationships, social capital both builds on and creates collaboration, trust and collective actions (Nahapiet and Ghoshal 1998). Coleman (1988) suggests that a group can accomplish more if extensive trust exists within the group. Another aspect of social capital is the creation of norms, where the norm to act for the collective rather than in self-interest is especially strong (Coleman 1988).

Social capital is in this paper seen as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam 1995: 67). In more detail the paper will apply Nahapiet and Ghosal (1998) division between structural, relational and cognitive dimension of social capital, which also Bresnen *et al.*, (2005) used when exploring social capital in the construction industry. The structural dimension, firstly, is the pattern of the network of actors, who can reach who and how. This dimension describes the existence or lack of ties between actors, in terms like hierarchy, density and connectivity. Second, the relational dimension is what kind of relationships individuals or groups have developed through interactions. The focus is put on relations that influence behaviour and create assets such as identification, norms, trust and expectations. Lastly, the cognitive dimension describes the individuals and groups perceived value of being a part of the network. It describes the resources from which the actors receive representations, interpretations and meaning.

Earlier research has concluded that organizations can increase their innovative context by leveraging social capital (Nahapiet and Ghoshal 1998), and that social capital is being mobilized in innovative communities (Adler and Kwon 2002). Moreover, it has

been suggested that a focus on social and organizational aspects of knowledge creation and sharing is important for understanding innovation processes (Brown and Duguid 2001). As Styrhe (2008) points out, there has been a limited amount of studies on social capital focusing on the construction industry. The project-based context affects innovation processes and relationships, by being temporary and inter-organizational, why the social capital in this context is interesting to explore further (Bresnen *et al.*, 2005). It is suggested that it is more difficult to sustain social capital in project-based context as groups and networks change continuously (Bresnen *et al.*, 2005) but thereby social capital might also be even more relevant (Hansen 2002).

## RESEARCH APPROACH

The empirical findings are based on a longitudinal study of an urban development project in Stockholm, Sweden. More specifically, three developers, performing multi-family housing projects, have been followed during the course of their projects, from design and procurement to completion and hand over, for a total of three years. A longitudinal study has gained insight into the process where social capital has developed over time. A qualitative approach has been used in order to ensure rich explanations when studying actors' role from practice (Silverman 2013). The empirical material has been gathered from several sources to create a context dependent understanding of the on-going case (Flyvbjerg 2006). These include an early workshop with the developers' project managers, six observed planning meetings between the municipality and the developers' project managers, and interviews with three developers' project managers in the early phases as well as follow-up interviews with two of the developers during production and with all three developers again during completion (developer 1, 6 and 8). In addition to the eight interviews with developers, context dependent information was gathered from other types of meetings, informal discussions and over forty interviews with developers, contractors, operators and representatives from the municipality.

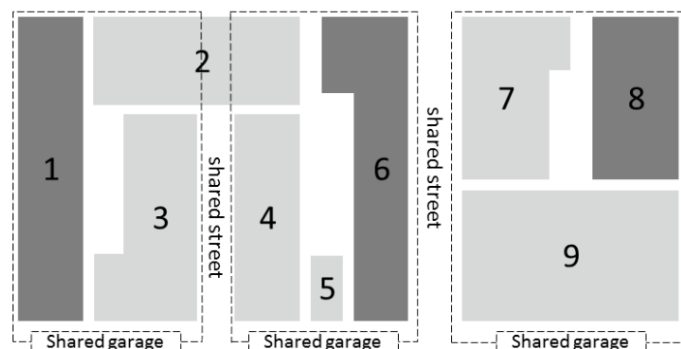


Figure 1: Overview of the nine developers, including shared assets

The context of the urban development in which the developers carry out their projects is characterised by a limited construction area where nine different developers build side by side in two different blocks where each block shares streets, backyards and garages, see figure 1 for illustration. The developers differ in that some build multi-family housing to sell as cooperatives other build rental housing planning to manage the buildings long term. The three developers (Developer 1, 6, 8) who have been followed are spread out in these two blocks in order to capture different issues of building in this context. The chosen clients are also different in that Developer 8 is responsible for the facility management of the finished multi-family housing building, while Developers 1 and 6 leave this to the future residents. Moreover, a high level of

sustainability requirements was established by the municipality, leading to an innovative context, both in terms of innovation initiative from the municipality and the need to carry out innovative solutions for the developers. The gathering of empirical material has focused on how this innovative multi-project context has affected the developers, in terms of prerequisites, interdependencies between projects, and their procurement of contractors. From this social capital, as defined above, has been used as analytical lens to understand the horizontal interdependencies in the parallel construction projects performed by different developers in the same innovative multi-project context. In more detail, the empirical findings were analysed by using the three dimensions of social capital suggested by Nahapiet and Ghosal (1998), structural, relational and cognitive.

## **FINDINGS**

### **Structural Dimension Between the Projects**

As highlighted in the introduction, the multi-project context of an urban development project consists of a large number of both vertical and horizontal structural ties. The network of relationships in focus here is that between the developers in parallel projects, and in extension their contractors and the municipality. The relationship between the developers is informal at the starting point of the projects, where the project managers refer to the municipality as a coordinator between the developers. The project manager at Developer 8 describes it as an “organized chaos” when discussing the required collaboration between the projects. All interviewed developers highlighted the fact that this is not a project that they can perform without cooperation, especially as they have close-by neighbours performing parallel projects. The project manager at Developer 1 explains that “this is not a field where you can just set up your own stuff and start work”.

All developers have some neighbours that are closer and with whom they share for example backyard and garage, those ties are naturally more important. As project manager at Developer 8 puts it, after having described their relationship with their closest neighbour; “we are also neighbours with others, but not structurally”. The project manager at Developer 6 suggests that the site manager at their appointed contractor should handle the collaboration between the projects. Even though some developers are closer than others they are all in the same context, in the sense that they have the same responsibilities towards the municipality, exist in the same overall structure. For example, they have the same high sustainability requirements that they have to meet, they all have to use the construction logistics centre for all on-site coordination, and they have to meet the coordinated time tables. The municipality arranges a meeting every month with all developers where they inform of the latest activities and encouraged the developers to share their progress. From the meeting observations it is visible that these meetings are mainly used by the municipality to share information whereas the developers are rather quiet. However, during small talk before and after the meetings the developers interact and discuss their projects informally.

### **Relational Dimension Developed Over Time**

From the structural ties, as described above, some patterns of relationships have developed over time during project execution. Apart from the formal meetings arranged by the municipality, the developers' project managers describe meetings initiated by themselves, mainly between the closest neighbours, with whom they share

street, backyard or garage. The developers have initiated different “work groups” where they have overlapping interests. As exemplified by project manager at Developer 8, they share backyard with four other developers with whom they have started a meeting forum. They also share a small street with two other developers; during the production phase they realized that this affected their projects a lot and thereby started a meeting forum to discuss joint issues. Moreover, project manager at Developer 6 highlights that apart from meetings “it's starting to pop-up contracts between developers, so we won't be able to let each other down”, and continue reflecting that “it's good, I guess, to have something on paper even though you want to have faith in one another”. One example of this is found at Developer 1, where they have created a joint sub-project together with their two closest neighbours in order to carry out their common garage and backyard. They have appointed one external project manager consultant to run the project, and they meet every other week to coordinate in what they call a “developer forum”.

Developer 6 has another example of how they have developed formal relationships to their closest neighbour. When procuring their contractors, they realized that they would need an extensive amount of coordination as they shared basement with a garage. To handle this they decided to procure the same contractor, their project manager says “we found one contractor, it was not the cheapest for either one of us, but they felt stable...in order to minimize the friction”. During the last interview, at project completion, the project manager describes several issues with sharing one contractor. They had to delay their time plan to account for delayed deliveries in their neighbour's project. Moreover, they had planned to share site office and site personnel to ensure coordination, in the end they had to set up two separate site offices due to project overload for the site personnel. When asked if the project manager would have been procured in the same way in hindsight, he was doubtful and said that a conventional procurement strategy might have worked better. Their developed relationship changed over the projects process.

When reflecting on the municipality's role in bringing the developers together the project manager at Developer 1 sum up “the people at the municipality are great at the informal interaction, they are willing to help and solve issues. But at a formal level, at a contract level and where different responsibilities lie, for example crane coordination, there is room for improvement so to say.” The crane coordination is a much-discussed issue both on a formal and informal level. From meeting observation spanning over a year, this issue is discussed over and over again. The municipality try to encourage the developers to handle the coordination or even to collaborate by sharing cranes. Meanwhile the developers sat back and awaited orders on how to deal with the large number of cranes within a relatively small area. At a meeting after production had started, but the issue had not been solved yet, one developer jokingly says, “it looks like we don't have to put up a crane we can just use everyone else's”. A participant from the municipality sighs and says “Yes, that arrangement would have been the preferred one from the start”. The project manager at Developer 1 reflects over the issue with crane coordination that “we could just go to the other developers, or contractors, and say please don't place your crane there... but for some reason we don't”.

### **Cognitive Perception of the Relationships**

An overall view is that the developers seem to have both positive and negative perception of the ties and relationships with their neighbours. As illustrated above, on

one hand they feel that there is a lot of coordination happening, but on the other hand they seem to appreciate their neighbours' experiences. Developer 1's project manager explains happily that "our neighbours are two very skilled developers". Another example of positive aspects from having neighbours is highlighted by the project manager at Developer 6, describing that they discussed the construction logistics centre with a developer who had built in the area before, and therefore had used the centre, in order to get their experiences of dos and don'ts. However, it seems that the developers do not continuously share their experiences. Project manager at Developer 8 says that they had difficulties to deliver on the high energy requirements, but in the end found a solution using the waste water for heating. He said that all developers faced this issue but when asked if he had shared their solution with the other, he said: "no, not really". Here they did not use their developed relationships.

Apart from the horizontal relationship between developers, the three developers' project managers reflect a lot around their relationship with their appointed contractors. All of them perceived these relationships as being extra important in projects with this high level of complexity, in terms of sustainability and innovative requirements. When describing their procurement strategy, the project manager at Developer 8 says; "the industry has shown a large interest to be involved early". Meanwhile, the project manager at Developer 1 reflects over that they are "very dependent on being perceived as an attractive client for the contractors". In other words, the developers cannot just approach the contractors that they perceive as knowledgeable and trustworthy, they must take their own appearance into account in order to attract contractors. In the same spirit, the developers reflect over the importance of creating good prerequisites for their end customers, the residents. Developer 6, who plans to have sold their apartments at project completion, says that they perceive a difference between the developers. Developers with a long-time horizon (e.g. public rental organizations) seem to value their relationships more. On the other hand, developers that sell their apartments in the form of a cooperative tend to be more focused on on-time and on-budget, whilst at the same time creating high-end apartments for their buyers. The project manager at Developer 1 says he sees the other developers as "colleagues" but at the same time realize that they compete over the same end-customers, selling their finished apartments at the same time.

## **DISCUSSION**

### **Social Capital Between the Developers**

By analysing the empirical findings from the three dimensions of social capital, structural, relational and cognitive (Nahapiet and Ghoshal 1998), it becomes apparent that the developers act as neighbours. The findings also indicate that they do not use their potential social capital to its full extent. To compare developers building next to each other to community neighbours seems effective as it can point towards what relationships developers actually have and build over time, but also that how they interact affects their project performance. Being a developer in an urban development project you know you will have neighbours, but you will not know who before your project starts. In a Swedish context, this is in most cases decided by a municipality. The findings show that the neighbours affect each other to a large extent, sharing structure, creating contracts and coordinating time plans and logistics. Compared to the much-discussed vertical relationships that developers create with contractors, suppliers and consultants (Eriksson 2015, Vrijhoef and Koskela 2000), in these horizontal interdependencies they cannot ask for and decide on the options best suited

for their own project. They have to trust the municipality to choose appropriate neighbours to collaborate with and informally develop required relationships. This case study has shown that the developers have approached this issue with different success, some initiative have been fruitful whilst others have further complicated their projects. What can be concluded from this is the importance of taking the horizontal interdependencies into account and to build relationships from these over the project time in order to be able to carry out the construction projects.

### **Horizontal Interdependencies in the Multi-Project Context**

The municipality aimed for the area to be innovative in order to create sustainable urban development, both by putting in place strict requirements on the developers and by hoping that they would take own initiatives. In line with previous findings (Bygballe and Ingemansson 2014, Cabrera and Cabrera 2002, Levina 2005) an innovative inter-organizational context seems to be difficult to come by. In the few examples where developers describe that they have used somewhat innovative solutions it has been primarily to benefit their own project with no formal experience sharing has been identified. The developers' own innovative solutions are not spread beyond their single project boundaries (Karrbom Gustavsson 2018). The findings also show that when the developers mobilize their social capital to handle the innovative context (Adler and Kwon 2002) their effort does not hold up all the way. As Bresnen *et al.*, (2005) point out this can be due to projects short timeframe as relationships take time to build up.

While Engwall and Jerbrant (2003) focus on resource allocation as a main issue for intra-organizational multi-project contexts the focus here has been on the interdependencies between parallel projects. Interdependencies between projects are regarded as difficult; especially if the projects are close neighbours and share some tangible structure such as a garage or backyard. To handle this, the developers have, during production, created meeting forums and contracts to handle both the production and the long-term facility. Two other interdependencies that affect the production for the developers have been identified, namely; logistic issues regarding shared infrastructure and that they have to coordinate their time plans as they build close to each other. All in all, the findings have identified that the developers have to coordinate over structures, contracts, logistics and timeframes.

Another issue with interdependencies between parallel construction projected performed by different developers is the fact they might be competitors over the same end-customers i.e. those who will buy or rent their apartments. Therefore, the developers have a balancing act in that they must collaborate in order to carry out their project, but at the same time they collaborate with their competitors. Compare with Coleman's (1988) findings that the norm to act for the collective rather than in self-interest is strong. In line with this, the developers did not express such difficulties in collaborating with competitors. One reason for this could be their varied business models as some are private developers who will sell the buildings to cooperatives, handling the facility management. In the other end of the spectra are the public developers responsible for the facility management and renting out their apartments on the controlled rental market. Another issue regarding time frame is that projects often have short time frames, which affect collaboration as relationships and social capital take time to build (Hansen 2002). Even though construction projects take long time to complete, participants often have a single project focus believing they will not work with the same people again.



## CONCLUSIONS

The purpose has been to increase the knowledge of horizontal interdependencies in innovative multi-project contexts by exploring what social capital has been built up between the developers in order to handle these interdependencies. From a longitudinal study of three developers performing construction projects in an urban development project, the findings show that there exist several horizontal interdependencies between the parallel projects. When different developers perform projects as neighbours, i.e. build close-by in a limited area, they become interdependent structurally, contractually, logistically and time wise. These interdependencies are embedded in the multi-project context and affect the developers both during design and production, as well as in the long-term facility management. To handle these interdependencies the developers, have to collaborate. The findings show that they do, to some extent, build up and use social capital in order to create inter-organizational (inter-project) relationships.

With the on-going urbanization in mind, the findings contribute to the construction management literature by highlighting the importance to take horizontal interdependencies into account when exploring collaboration and innovation between inter-organizational actors and projects. Rather than to just focus on formal, e.g. contractual, relationships horizontal interdependencies is a main issue in construction projects in multi-project contexts. The findings also contribute to multi-project management literature by presenting a novel empirical multi-project context. Implication for construction management, both developers and governmental actors, to be drawn from this is that when performing parallel and sequential construction projects in multi-project contexts the horizontal interdependencies must be planned for and resources allocated to handle the required collaboration. The findings should be viewed as tentative where comparative studies from other multi-project contexts are suggested and also to extend the knowledge of how parallel developers actually handle the interdependencies from a practice perspective.

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