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Organisational routines in multi-project contexts: Coordinating in an urban development project ecology

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ABSTRACT

Project management literature have focused on either intra-organisational relationships or on vertical inter-organisational relationships. The purpose of this paper is to explore inter-project interdependencies and coordinating in multi-project contexts by using the notion of project ecologies. We adopt an organisational routines perspective to explore the coordinating practices managing those interdependencies. The empirical material underpinning our findings were collected and analysed through a case study of an urban development district, new to both the project ecology literature and the organisational routines literature. The findings highlight the existence and importance of horizontal interdependencies in project ecologies, as compared to the more commonly studied interdependencies in vertical relationships within and between projects. The need for horizontal coordinating is outside project managers' regular focus on steering vertical relationships. Accordingly, the routines to manage the horizontal interdependencies in project ecologies are different to those in more engineered routines that are often described in project management guidelines.

1. Introduction

In recent years, a common line of argument is that projects are used across almost all organisations and industries, and that society is now 'projectified' (Jensen, Thuesen, & Geraldi, 2016; Lundin et al., 2015). With the increased usage of projects as an organisational form, multi-project contexts and the management of them have become increasingly relevant, both practically and theoretically (Martinsuo & Hoverfält, 2018). Multi-project contexts come in many forms, including programmes and portfolios (Martinsuo & Hoverfält, 2018), project networks (Manning, 2010) and project ecologies (Grabher, 2004; Söderlund, 2004). Following Grabher (2002), project ecologies are links and interdependencies between projects with multiple organisational actors in project-intensive contexts. Important aspects include the personal relations, localities and corporate networks, where the focus lies on interdependencies between projects, actors and their contexts (Söderlund, 2004). Project ecologies are of interest, as they can guide analysis of projects from a contextual view (Grabher & Ibert, 2011), in line with the notion that projects are not isolated phenomena (Engwall, 2003).

Geraldi and Söderlund (2018) identify project ecologies as a research area with the potential to extend the knowledge in project studies. They further suggest moving between micro and macro perspectives, e.g. viewing project ecologies through a practice lens. Project ecologies do not limit research to the technocratic and rationalistic approaches that has often dominated the field of project studies (Cicmil & Hodgson, 2006). Developing the understanding of the links and interdependencies between projects is a way to apply a 'broad view' on projectification (Packendorff & Lindgren, 2014). Empirical research on multi-project management has usually had a focus on R&D departments, organisational change and product development – mostly adopting an intra-organisational perspective (for example Kock & Gemünden, 2016; Martinsuo, 2013). Project ecologies, on the other hand, offer (and require) an inter-organisational perspective on multi-project management.

One empirical example of project ecologies, important for the development of sustainable cities and societies and to the understanding of how projects and project management can achieve sustainability (Huemann & Silviu, 2017), can be found in urban development districts. An urban development project ecology consists of parallel and sequential

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infrastructure and housing projects of different sizes and durations, managed by different developers over an extended period of time within a specific district of a city. In such ecologies, many different types of actors within the Architectural, Engineering, and Construction (AEC) industry (e.g., developers, construction clients, architects, technical consultants, contractors, sub-contractors, and material suppliers) come together with planners and other governmental entities to develop new or existing parts of a city. This leads to a project ecology with many temporary relationships between individuals, projects and organisations, all of which need to be coordinated (Bygballé, Swärd, & Vaagaasar, 2016). As most developers are professional, with construction projects as their core business, they have a history with the other actors involved, including the local government, and thereby a future to protect in the industry by securing future projects.

Project studies have focused on either intra-organisational relationships or on vertical inter-organisational relationships (for example Eriksson & Pesämaa, 2013). By adopting a project ecology perspective and studying an urban development project ecology, we focus on inter-project interdependencies, where project managers are confronted with relationships outside the project (Lundin et al., 2015). In an urban development project ecology, horizontal inter-project interdependencies develop, which in turn initiate relationships that are mostly not governed by contracts but often start off as informal and then develop over time (de Blois, Herazo-Cueto, Latunova, & Lizarralde, 2011). How these inter-project interdependencies develop over time in an urban development project ecology is less known and important for project managers to understand when coordinating is needed between projects.

Martinsuo and Hoverfält (2018) suggest organisational routines as a theoretical lens to study multi-project management. A focus on routines is also suggested to expand the understanding of coordinating across organisations and innovating in uncertain contexts (Howard-Grenville, Rerup, Langley, & Tsoukas, 2016). Over the last few years, research on routines has mainly focused on the micro level, studying specific routines and how they change over time (for example Bygballé & Swärd, 2019; Davies & Brady, 2016). Another option is to zoom out (Howard-Grenville et al., 2016), focusing on the context in which actions take place. By zooming out, we can develop better understanding of inter-project relationships and how practices and routines develop when project managers of different but interrelated projects in the same multi-project context are faced with joint challenges, for example such challenges that are related to sustainable development of cities and societies (Marcelino-Sádaba, González-Jaen, & Pérez-Ezcurdia, 2015).

The purpose of this paper is to explore inter-project interdependencies and coordinating in a multi-project context, in terms of an urban development project ecology. We deepen the understanding of inter-project (horizontal) relationships in project-intensive contexts by exploring how coordinating practices and routines develop. We do this by combining a micro and macro perspective by zooming-out to an urban development project ecology and exploring coordinating practices managing the interdependencies within that project ecology. This corresponds to Geraldi and Söderlund's (2018) suggestion to further develop project studies by crossing levels of analysis from micro to macro to create a better understanding of practices. Moreover, complex project contexts, such as project ecologies, are identified as contexts well-suited to studying coordinating practices, due to the high level of interdependencies (Lenfle & Söderlund, 2018).

The ongoing global urbanisation trend, in combination with the ongoing 'projectification' trend, calls for better understanding of management inside this type of project ecology. Moreover, routines are important within and between projects (Davies & Brady, 2000) but studies of the internal dynamics of routines are scarce in multi-project contexts. By using routine dynamics (Feldman & Pentland, 2003) as a theoretical perspective, we follow Feldman's (2016) suggestion to focus on actions rather than actors, in order to understand the patterns of continuously changing and maintaining routines.

Based on the above, we first describe the characteristics of the urban development project ecology, before we answer the following research question: how do routines develop when project managers coordinate their horizontal interdependencies in this type of project ecology? This is in line with Blomquist et al.'s (2010) suggestion to explore projects from a practice perspective and to see how inter-project interdependencies lead to routines. The present study is limited to horizontal interdependencies between inter-organisational projects, and therefore discussions on other relationships in and between projects have purposely been excluded.

2. Literature overview

2.1. Multi-project contexts as project ecologies

Multi-project contexts are characterised by organisational units executing several interdependent projects (Engwall & Jerbrant, 2003). As such, in multi-project contexts, there are linkages between the projects, where parts and interdependencies are integrated, creating a context difficult to predict and control (Jerbrant & Karrbom Gustavsson, 2013). Multi-project contexts are seen as uncertain, where the often long duration entails development and change of the context because, for example, the actors' needs and expectations change over time (Martinsuo & Hoverfält, 2018), making rationalistic approaches to planning and control less relevant.

Geraldi and Söderlund (2018) identify inter-organisational multi-project contexts as an area of interest, using, for example, the term *project ecologies*, which has the potential to extend the knowledge in project studies. According to Grabher (2002, p.246), project ecologies "explore interdependencies between projects as well as the personal relations, localities and corporate networks on and around which projects are built". Grabher (2004) further develops the term by presenting a framework, saying that project ecologies are built from the layers of the core team, firm, epistemic community and personal networks. Moreover, he concludes that a project ecology emerges over time through interactions between organisations and project teams in several sequential projects. In the present study, the term 'project ecology' will be used to explore the complex interdependencies of urban development districts, where several construction (and infrastructure) projects of different size and duration are performed by different developers (clients) and teams, within the same geographical area.

Project ecologies are used in order to analyse projects from a contextual perspective (Grabher & Ibert, 2011), where the focus can be on varied areas such as the economics or sociology of projects, or the link between participants and organisation development (Söderlund, 2004). Table 1 summarises relevant previous research on project ecologies, showing that empirical research on project ecologies started in the creative industries and spread to empirical contexts such as biomedical, infrastructure and property development. However, urban development and the AEC industry have not yet been used as empirical contexts, even though Lundin et al. (2015) assert that it is a suitable industry for project studies. Theoretically, prior research has mainly focused on organisational development in terms of learning between projects and organisations (for example Lobo & Whyte, 2017; Newell, Goussevskaia, Swan, Bresnen, & Obembe, 2008) and economic geography (for example Grabher & Ibert, 2006; Siemiatycki, 2011). Söderlund's (2004) call for more research on project ecologies within project studies has not been answered to any significant extent. Moreover, only a few studies have even partly discussed routines within project studies; Sydow (2009) concludes that too rigid project routines in project ecologies can lead to lock-ins, and suggests that more research on relations and routines in project ecologies is needed.

It is through social interactions that the project ecologies emerge, when an organisational programme or structure is absent (Newell et al., 2008). These social interactions happen between different organisations and professions where different social logics, principles and cultures are

Table 1
Summary of previous studies on project ecologies.

Article	Method	Empirical context	Relevant findings	Suggested further studies
Aligning and reconciling: Building project capabilities for digital delivery (Lobo & Whyte, 2017)	Qualitative single case study (questionnaire, interviews, documents, observations)	Infrastructure	How a PBO builds project capabilities in project ecologies and in the learning between projects. Knowledge through combining 'economies of repetition' and 'economies of recombination'.	How organisations build dynamic capabilities in project ecologies. Analysis of dynamic capabilities at different strategic levels.
The embedded developer: Using project ecologies to analyse local property development networks (Henneberry & Parris, 2013)	Qualitative single case study (interviews and documents)	City planning and property development	Open up the black box of the property development industry through project ecologies framework. Division between pre-project ecology and project ecology.	How performed projects affect the project ecology.
Public-private partnership networks: Exploring business-government relationships in United Kingdom transportation projects (Siemiatycki, 2011)	Quantitative network analysis (database, documents)	Infrastructure	Highlight tension between benefits and drawbacks of repeat collaboration on one-off projects.	Connection between repeat partnership and performance in projects.
Path dependencies in project-based organising: Evidence from television production in Germany (Sydow, 2009)	Qualitative multiple case study (interviews and documents, site visits)	Television	Path dependencies are multi-level phenomena, from single projects to ecologies. Embedded, rigid project routines risk inert project ecologies.	The interplay of processes between different levels (single project to project ecology) and the role of project relations and routines.
Interdependencies in complex project ecologies: The case of biomedical innovation (Newell et al., 2008)	Qualitative multiple case study (interviews, documents, site visits)	Biomedicine	Describe challenges associated with context where multiple, dispersed projects are interdependent and its effect on innovation processes and learning within projects.	The role of power in project ecologies.
Bad company? The ambiguity of personal knowledge networks (Grabher & Ibert, 2006)	Qualitative multiple case study (interviews, documents)	Software, advertising	The role of personal networks in project ecologies, with conflicting identities. How project members' learning gives them competitive advantage.	The personal network effect on project ecologies beyond the single-project lifetime.
On the broadening scope of the research on projects: A review and a model for analysis (Söderlund, 2004)	Literature review	Conceptual	A framework for analysis of project studies. Project studies has focused little on contexts of multi-projects and multi-firms.	Call for research on project ecologies in project studies.
Temporary architectures of learning: Knowledge governance in project ecologies (Grabher, 2004)	Qualitative multiple case study (interviews, documents)	Software, advertising	Different levels in project ecologies. Framework for analysing project-based learning in project ecologies.	Categorisation of project ecologies.
The project ecology of advertising: Tasks, talents and teams (Grabher, 2002)	Qualitative single case study (interviews, documents)	Advertising	Defining project ecologies through an empirical example. Shedding light on the social ties in project contexts.	Are the findings relevant for other empirical contexts?

present, which can both stimulate interaction and create tension and conflicts through rivalry (Grabher, 2004). The different norms, practices and relationships (Dille & Söderlund, 2011) will guide the actions taken (Manning, 2008). Therefore, performing projects in project ecologies entails coordinating challenges where relations and power shift between actors and negotiating different perspectives is continuously required (Newell et al., 2008). Moreover, coordinating between actors and projects should depend both on formal mechanisms such as contracts, and informal connections such as personal relationships. Routines between organisations, through informal development, are also suggested as a coordinating mechanism in project ecologies (DeFillippi & Sydow, 2016).

2.2. Coordinating between projects

The act of coordinating is present in all project ecologies where actors need to synchronise, align and adjust their actions to handle their interdependencies (Gulati, Wohlgezogen, & Zhelyazkov, 2012). Coordinating in project ecologies can be seen as managing interdependencies between actions (Malone & Crowston, 1994). Interdependencies are

constantly present in project contexts where various groups with different professions and goals are temporarily brought together without much previous knowledge of each other (Jacobsson, 2011). Accordingly, several ways to coordinate are discussed in project management literature – from formal tools to informal aspects such as trust (Bygballe et al., 2016). Furthermore, role structure and ensuring enactment of roles enable coordinating actions in project contexts (Bechky, 2006).

Jacobsson (2011) notes that research on coordination in project contexts has not focused much on actions or the coordination between actors while they interact to perform their projects. A positive spiral is suggested when actors come together to perform coordinating actions, as these can develop trust between actors and foster further coordinating actions (Gerwin, 2004). This should be seen as important in developing informal relationships, such as those between developers when they manage the inter-project interdependencies in the project ecology explored in this study. Multi-project contexts are less about rationalistic planning and structures, and more about handling continuous changes and crises (Karrbom Gustavsson, 2016), which is why actors' need to adjust to tools and practices when facing new coordinating issues (Bygballe et al., 2016). Therefore, project ecologies do not imply

transactional interdependencies handled through, e.g., rules and supervision; instead, mutual decisions and adjustments are required when actors need to temporarily combine their resources (Grandori, 1997). In these contexts, the interplay between coordinating and competing will pose challenges (Lundin et al., 2015). Lenfle and Söderlund (2018) assert that complex project contexts are well-suited to study coordinating actions between interdependent actors from different organisations, as the context represents the ‘limits of coordination’.

The above line of thought implies a focus on the micro processes (Feldman & Orlikowski, 2011) and a practice perspective on coordinating, where Bygballe et al. (2016) suggest coordinating to be an emergent process. The coordinating is seen as evolving and self-organising actions to achieve various project goals (Ahern, Leavy, & Byrne, 2014). From this practice perspective, coordinating is seen as actions that can be mediated through, for example, organisational routines (Okhuysen & Bechky, 2009).

2.3. Organisational routines

In line with Tsoukas and Chia's (2002) view on organisations being an ongoing combination of emerging and structured patterns, routines are seen as not being stable over time and space (Feldman, 2000). Organisational actors' differences and streams of actions will thus lead to change in routines, which are described as “repetitive, recognizable patterns of interdependent actions, carried out by multiple actors” (Feldman & Pentland, 2003, p. 95). Routines are not easily transferrable but embedded in their context with internal dynamics (Parmigiani & Howard-Grenville, 2011). This practice perspective on routines focuses on the arrows – rather than the boxes – in an organisational chart, in order to understand processes (Feldman, 2016) and how actions produce outcomes (Feldman & Orlikowski, 2011). Further, the outcome of either stability or change is seen as significant only in the context illustrated. This situated change perspective is suggested as useful when exploring change in and between organisations, where the emphasis is on flexibility and self-organising (Orlikowski, 1996), such as in a project ecology.

This perspective on organisational routines, where the focus is on the actions, has been developed into a research field called *routine dynamics*. This field has taken a practice turn on organisational routines, similar to the project-as-practice turn identified by Blomquist, Hällgren, Nilsson, and Söderholm (2010). The interconnections between social entities are the focus, and organising is seen as ongoing routinised accomplishments (Nicolini, 2012). Such a turn can help connect the macro and micro perspectives of a phenomenon (Jarzabkowski, Balogun, & Seidl, 2007). In research on routines, this perspective can guide explanations of the dynamic and performance aspects of routines (Dionysiou & Tsoukas, 2013), where routines reflect what, how and why things are done (Cohendet & Llerena, 2003).

Routines have both structural features and are enacted in practice (Feldman & Orlikowski, 2011), which is why they have been described as effortful and emergent accomplishments (Pentland & Rueter, 1994). These two aspects are now commonly described as the ostensive and performative aspects of routines (Feldman & Pentland, 2003) or, as later suggested by Feldman (2016), as patterning and performative. The first is the abstract idea of routine (i.e., routine in principle) and the second is the specific actions carried out by specific individuals (i.e., routine in practice) (Bygballe & Swärd, 2019). This means that routines are not simply followed, but that individuals perform actions to either follow a routine or change it (Feldman & Pentland, 2003). In essence, “a routine doesn't exist without being enacted” (Feldman, 2016, p. 29), and focusing on actions makes routines come alive rather than being invisible forces (Feldman & Pentland, 2003). Actions can be defined as doings and saying in time and space (Schatzki, 2012). In putting the attention on actions in viewing routines, the connections between phenomena such as people, materiality, emotion, history, power and time become visible (Feldman, 2016).

2.4. Organisational routines in project-based contexts

In a project context, different routines from different actors come together for a limited time. Routines are seen as important to build project competence and capabilities (Davies & Brady, 2016; Söderlund, Vaagaasar, & Andersen, 2008), and performing joint routines is claimed to increase project performance (Zollo, Reuer, & Singh, 2002). In line with this, Bresnen, Goussevskaia, and Swan (2005) find that routines established locally facilitate new initiatives. In order to create new joint routines, cooperation and previous relationships are important (Luo, 2002). Thus, a common understanding and social ties aid the process of creating joint routines (Feldman & Rafaeli, 2002). Artefacts are also seen as important for new routines to develop, as they can enable problem-solving and resolve conflicts (Cacciatori, 2012).

The research on routines in projects has mainly focused on single projects or project-based organisations, and on how to create new joint routines in order to increase project capabilities. The conclusion drawn here is that existing routines from different actors prevent new routines developing (Hartmann & Bresnen, 2011). Bygballe and Swärd (2019) conclude that project managers should aim to create routines between organisations to increase project efficiency. The interdependencies between the actors' practices make coordinating needs difficult, especially when uncertainty, novelty and change are high (Jarzabkowski, Lê, & Feldman, 2012).

3. Case and method

3.1. Case description

The empirical findings are drawn from a case study of a large urban development district in Stockholm, Sweden. This case is considered suitable to study as a project ecology and for exploring coordinating actions because it provided the opportunity to study the practices of developers' project managers when performing their different projects side by side. A single case study was chosen to look in-depth at the explored phenomenon and be able to present rich descriptions (Langley, 1999). The case provided insight into how the project managers' practices shifted over time. From a project ecology viewpoint, this case provides insight into the informal inter-project relationships identified as significant within project ecologies (e.g. Grabher, 2004; Newell et al., 2008).

The district was initiated by a large Swedish municipality, and it consists of several sequential parts (stages), where each stage includes infrastructure work and around ten housing, office and/or commercial construction projects performed by different developers (clients) appointed by the municipality's planners through land allocation. In this context, the developers perform their different projects in parallel and sequence with several other construction projects, and they procure different suppliers and contractors to perform the actual construction work. Moreover, as most actors are relatively local, most developers, suppliers and contractors will have previous relationships with each other and most developers have done projects with the municipality before. Future interactions are also an overhanging potentiality; all this creates a complex context with various formal and informal connections. The urban development project ecology, therefore, creates a set of coordinating aspects for the developers to relate to when performing their project processes (see Fig. 1).

The case study involves exploring the developers' inter-project coordinating in eleven parallel housing construction projects in a certain stage of the district. The specific case was chosen because it was still in its early phases, allowing routines developing to be studied. Moreover, the case was of interest as the eleven developers are all different organisational units with different characteristics: some small and new in the district, while others are large and well established. Within this stage however, all developers have the same prerequisites and are building similar-sized housing projects.

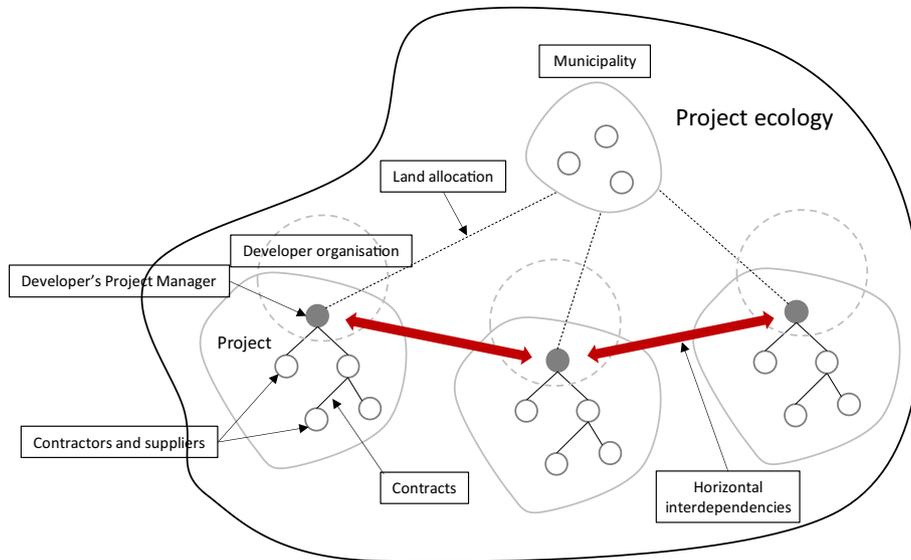


Fig. 1. Illustration of the studied project ecology.

In the studied stage, the municipality's land allocation has led to two to three developers building in the same block and them sharing structures such as courtyards, and furthermore two to three blocks sharing garages. Accordingly, the developers and their projects form a project ecology in which they have strong interdependencies. Fig. 2 presents an overview of the eleven developers and how they structurally relate to each other. The land allocation was completed in April 2016. At the time the study started, the developers' projects had already been running for two years, with an estimate of being completed five years later, in 2023. In other words, the studied projects are running over a long period of time, making it possible for routines to develop in and between the projects within the project ecology. The chosen case can provide an insight into how the developers coordinate and manage their interdependencies and how routines have developed through their practices.

Due to their interdependencies, the developers do not just have their own project to think about, they must also take the other parallel projects in the same stage into consideration. This includes coordinating between the developers and consultants during the planning and design phases, and their contractors during the construction phase. From a facility management perspective, it also raises questions of how to manage and maintain the shared facilities in the long run. To name a few examples of this, the developers must, at a minimum, coordinate their construction

schedules with each other, create formal contracts for the shared facilities, and ensure buildability in the connection points between their projects. This district was seen to be of interest for this study because the context challenges the developers' project processes, both in terms of the sustainability processes and products introduced by the municipality and the necessary interaction between the developers.

On a policy level, the district is a test bed for sustainability processes and products with a specific focus on environmental sustainability, and the municipality has an explicit expectation that the developers will use these processes and products in their subsequent projects. For example, the municipality has initiated a construction logistics centre to coordinate construction projects and material deliveries. The municipality has also developed a sustainability platform, where all developers must deliver plans and results from their respective projects, such as energy calculations. As a final example, the municipality has incorporated product requirements into their land allocation agreements, including green roofs and reduced water sewerage systems. All in all, the district is governed by highly ambitious requirements for the developers to reach; one project manager described it as working with "extra everything".

3.2. Collection of empirical material

The case described above was explored by collecting empirical material through observing meetings and interviewing actors. Combining different sources is valuable as it facilitates consistency through comparison and thereby helps improve the quality of the study (Eisenhardt, 1989). The methods were chosen in order to study the relationships between the project managers and the actions they took (Pentland & Feldman, 2005). As a first step, four meetings between the developers' project managers and representatives from the municipality were observed during January and February 2018; field notes were taken throughout the meetings and were later written up. The meetings covered both information regarding timeline and technical issues from the municipality, as well as discussion about what joint issues the developers had (e.g., the shared garages and the optimal building order to enable buildability). The observations focused on how the developers responded to the information given by the municipality, how the developers discussed their joint issues, and the municipality's role during those discussions.

In the second step, interviews were conducted with developers' project managers to follow up on the observations from the meetings, with questions about their practices in the project ecology and how they relate to the other parallel projects. The project managers at the

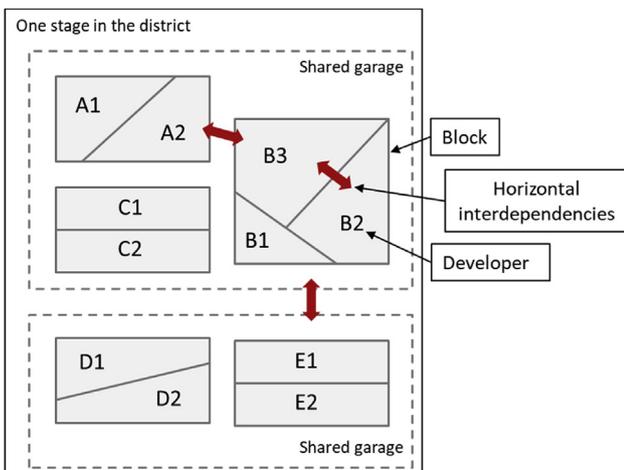


Fig. 2. Overview of how the developers share blocks and garages.

developers were all professionals in the AEC industry and had different educational backgrounds, e.g., in urban planning, architecture and construction project management. Moreover, the length of their practical experience as project managers differed from just a couple of years to over 20 years. Interviews were also conducted with representatives from the municipality, focusing on how the municipality had planned the land allocation and how they perceived the developers' practices. All participants at the meeting observations were interviewed because they worked actively in the studied section of the project ecology and were responsible for either a construction project or the municipal work. Interviews lasted for around 1 h, were conducted between March 2018 and April 2019 (see Table 2 for a summary of the respondents) and were recorded and transcribed verbatim.

3.3. Analysis of empirical material

The empirical material, i.e., field notes and interview transcripts, was analysed in several steps, inspired by Gioia et al.'s (2013) suggested analytical process for inductive research. The collection and analysis of empirical material was an iterative process. First, the field notes from the

Table 2
Summary of interviewees (abbreviations are used in the following text).

Actor	Role	Block	Abbreviation
Client	Project manager	A1	A1-PM
Client	Project manager	A2	A2-PM
Client	Project manager, consultant	B1	B1-PM
Client	Project manager	B2	B2-PM
Client	Project manager	B3	B3-PM
Client	Project manager	C1	C1-PM
Client	Project manager	C2	C2-PM
Client	Project manager	D1	D1-PM
Client	Project manager	D2	D2-PM
Client	Project manager	E1	E1-PM
Client	Project manager	E2	E2-PM
Consultant	Coordination Manager, consultant	D	D-CM
Municipality	Associate Project Manager	-	M-APM1
Municipality	Associate Project Manager	-	M-APM2
Municipality	Project Manager	-	M-PM
Municipality	Sustainability Manager	-	M-SM
Municipality	Client support, consultant	-	M-CS
Municipality	Lawyer, consultant	-	M-L

meeting observations were analysed by categorising what the project managers discussed into three categories reflecting the project ecology: *innovations, the municipality's plans and processes, and neighbours*. In the second step, these three categories guided the collection of material from the interviews by steering the questions in the interview guide. During the process of conducting the interviews, time was spent on understanding the specific context the developers were handling, such as relationships and the overall project timeline. This was an important thing to do, because the issues and events discussed during the interviews were either ongoing or had occurred just before the study began. The developers also talked about their anticipation of the forthcoming parts of their project processes.

In a third step, a database with all the empirical material was created in NVivo, in order to structure the material and increase reliability. Expanding on the three initial categories found during the meeting observations, the material was coded into first-order themes (Gioia, Corley, & Hamilton, 2013). This process led to ten different themes (see Fig. 3), which created an understanding of the characteristics of the project ecology. Fourthly, second-order themes were sought by grouping the ten themes into four categories using a practice perspective (Nicolini, 2012): *gathering, contracting, unifying, and joint-outsourcing*. With the material structured into first and second-order themes, routine dynamics (Feldman, 2016) were used to make sense of the identified practices as routines. The findings focus on describing the project managers' practices when coordinating their interdependencies.

4. Findings

In order to facilitate readers' understanding of the empirical findings, the characteristics of the project ecology from the project managers' perspective are first described. Subsequently, we present and discuss four routines that develop when the developers manage horizontal interdependencies.

4.1. Characteristics of the project ecology

4.1.1. The developers' view of the project ecology

All the developers seem eager to be a part of the urban development district; it is an attractive location for them. The quote from D2-PM below summarises the view of the district – a view that seems to be shared by all the developers.

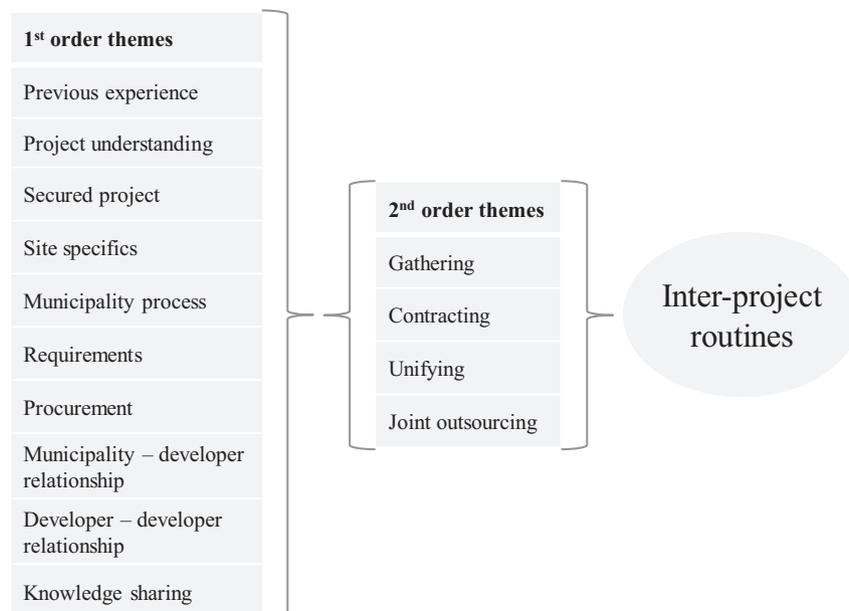


Fig. 3. Illustration of the analysis of empirical material.

“It’s a special location, it’s the capital of Sweden, it’s on a quay directly by the sea, it’s an international harbour with a lot of people coming through the district. And the municipality has high ambitions regarding sustainability ... so it is of course a tempting challenge, to succeed in a district like this.”

In other words, the district is seen as prestigious, but challenging to be a part of. This view corresponds with the municipality’s: *“The ambitions are extremely high and a lot of developers expressed a wish to be a part of the municipality’s next-generation environmental sustainability district. They really saw it as an opportunity to market themselves and show how good they are”* (M-CS). Due to its location and ambitious sustainability goals, the district receives a lot of media coverage, and other municipalities come and do study visits. So the developers see their projects as a marketing platform for their companies as well; some developers are new to the local market and believe they will benefit from being part of the district. A1-PM explained that *“[A1] have nothing up here but when we have built this project, then we will be a developer who knows how it is done in Stockholm. So it is marketing”*, which is in line with the developer’s experiences from having projects in the district. E2-PM saw it as *“a good qualification for new acquisitions and land allocations in similar districts, that we can show this experience”*. However, the project manager also saw downsides to building within a strict urban development district: *“The schedules are very uncertain ... you need to start at a certain time regardless of your internal and external resources, contractors, materials and so on. Or the consumer market. So there are positive and negative aspects”*.

The district is seen as a gathering of some rather conventional housing projects put in a very specific setting. B2-PM explained that *“On paper it’s a normal project but with these environmental requirements, and those parts, it’s not a normal project”*. Another project manager put it more directly, saying that *“It’s super complex from one perspective, but a small project in general. Yes, it’s complex because many parties have to collaborate. But it is a rather tiny project”* (B2-PM). The developers in general seem to have difficulties sorting out their projects; on the one hand, they have a conventional housing project, and on the other hand they have many new requirements that drive cost, but gain them experience and marketing. And they realise that, in the end, they have to build something that the market wants: *“All these requirements will in the end land on the end-customer. It’s the customer that will pay for these requirements”* (B2-PM).

4.1.2. Colleagues or competitors?

Most of the developers are building apartment buildings, either for the rental market or for cooperatives. The projects will be completed around the same time, so even though different projects might have different target markets, they must to some extent compete for their end-customers (those renting or buying the apartments). However, as described earlier, the developers have to coordinate their actions due to the shared context and, due to their interdependencies, the project managers must reflect on how best to coordinate with their potential competitors. While the project managers realise that they have to coordinate, they do see obstacles with self-organising. One example being that *“everybody has different goals and agendas”* (D2-PM), which means that *“everyone will optimise their own situation”* (A2-PM). One project manager felt that *“there are uncertainties, where the municipality has left the responsibility to us, to coordinate among ourselves”* (A2-PM).

The project managers seem to have different opinions about coordinating between the projects. One project manager called it a *“necessary evil”* (E2-PM), whereas another felt that it had worked well, saying that: *“We do have somewhat different agendas of course, but we carry-on and find actors that view the market in the same way. We are rather attuned”* (B3-PM). The same project manager continued reflecting over the benefits of coordinating: *“Should everybody sit for themselves and reinvent the wheel? That will be a bit unnecessary; we should be able to use our resources better”* (B3-PM). This corresponds to a municipality representative’s reflection that the developers *“must collaborate with their rivals in the blocks, it is very useful. I don’t know, but it might be more time-consuming. Afterwards, you might learn from each other”* (M-L). Moreover, the project managers all agree that being in the AEC industry means that one has to coordinate all

the time between different organisations and projects. Trust is seen as essential for the coordinating ahead of them, due to the horizontal, informal relationships that they have to build: *“it is all about time and trusting that we show each other our playing cards”* (D2-PM).

4.2. Four inter-project routines

When studying the practices of the project managers, four inter-project routines were identified: the *gathering* routine, the *contracting* routine, the *unifying* routine, and the *joint outsourcing* routine. These routines are described below, including why they developed and how their practices have been included in the project managers’ planning processes.

4.2.1. The gathering routine

During the observed meetings between the developers and the municipality, the developers often referred to certain internal developer forums, and how specific questions were jointly discussed at these forums. The issues discussed included, but were not limited to, how to handle the requirements from the municipality, how to coordinate time schedules, and how to build shared structures.

The forums appeared well established and organised, with different hierarchies: a first forum was for those sharing a block (2–3 developers in each), the next for those sharing a garage (5–7 developers), and the last for all 11 housing developers. However, when the project managers described these forums and how they came about, it became clear that they developed out of a need to coordinate among the developers, and from actions taken by individual project managers. One project manager described it thus: *“I believe it was one of the developers who called for a meeting regarding one or two issues. And then it moved on to additional questions, it has not been super formalised”* (A2-PM). This corresponds with the municipality’s understanding of the developers’ coordinating: *“in the blocks, I don’t really know, it’s different how they collaborate in my experience”* (M-APM1). One of the project managers, who initiated the largest forum, described the process as having *“become a close and natural collaboration, which continuously becomes clearer”* (D2-PM). The project manager said that these forums made communication clearer compared to other projects. Out of necessity, the project managers took action to gather themselves to discuss certain issues, and these gatherings have, over time, become practices now thought of as different forums.

4.2.2. The contracting routine

Since the developers’ projects started, they have all developed informal relationships with each other. They knew at the start that they would be building next to each other, and that they would be sharing courtyards, garages, etc. But exactly *how* these structures and connection points would be shared was not decided at that point. As mentioned above, these issues were discussed between the developers in their forums. A solution they came up with as a coordinating practice was to create contracts between each other. One project manager summarised the solution by saying: *“we will have a good deal of commonality agreements”* (D2-PM). As the projects are still in the planning phase, many of their common issues have not been resolved yet, and the current discussion revolves a lot around what to put into the contracts. One project manager said that they *“have landed on doing as little as possible jointly”* (D1-PM), whereas two other developers, who share a block, were discussing whether they should use the same contractor to facilitate coordinating during the production phase.

Even though the developers differ on how much they would prefer to collaborate, their set ups looks rather similar this far into the project. Those sharing a block with a joint courtyard have created a common construction – a type of contract that serves as an ‘umbrella’ client for the developers responsible for the joint structures. On the next level, those sharing a garage hired a lawyer to look into how to best coordinate their joint production and long-term facility management, including

contracting aspects. The lawyer will create a contract stipulating who is responsible for what and the division of costs. At this level, the project managers refer a lot to the municipality, wanting them to be involved in creating contracts to make sure all developers deliver what is needed. One project manager said it was the municipality's responsibility to coordinate: *"because the solutions are forced by the municipality, I believe that they should take responsibility for the contracts covering the production"* (E2-PM). The municipality, on the other hand, seemed to believe that this should be up to the developers: *"the municipality's role is just to make sure that it will be performed. If it is sufficient that [the developers] make agreements, the municipality should not be involved"* (M-L).

4.2.3. The unifying routine

During the observed meetings, it was clear that, on a lot of issues, the developers had a similar view – often a different one than the municipality: *"There have been issues where the developers have had a completely different viewpoint than the municipality"* (A2-PM). A recurring view during the meetings was that the municipality had complicated the process: *"the framing, the problem or the presumption could have been easier from start ... now everything is up to the developers together with the municipality"* (A1-PM). When exploring this further in the interviews, it seemed that either the issue had been discussed before in the forums, or that just a few of the more powerful developers were speaking out. In any case, the project managers' practices focus remains on coming together and unifying themselves into one single voice towards the municipality: *"Everything we want to tell the municipality, which we all agree on, we try to say with one voice"* (D1-PM).

During the interviews, the project managers described illustrative examples of actions they had taken together. In the beginning of the planning phase, there was an issue regarding basements and ground water level. The developers then *"sent out a joint email"* (D1-PM), asking for information and solutions from the municipality. When another issue occurred, one developer wrote a letter to the municipality asking all the other developers to sign it: *"I believe all developers have signed it. We support the letter"* (B2-PM). However, the municipality stated that they do understand why the developers unify and act with a single voice: *"those who have been dependent on each other in certain issues have joined forces. This can be interpreted as a way to become stronger against the municipality"* (M-L). One project manager, though, saw a problem with some developers being more powerful than others: *"since they are big and have a very clear view on how things should be, they come to their conclusions much faster than others"* (B2-PM). It seems that one or two developers are more proactive and their project managers take action to get issues solved, thereby becoming an unofficial cog in the wheel. One project manager from a smaller, more quiet developer, had *"seen that the municipality could see the synergies or couplings instead of us having to do everything individually ... of course they [the municipality] follow their guidelines but the cog in the wheel is sometimes missing"* (B3-PM).

4.2.4. The joint outsourcing routine

As mentioned above, three levels of meeting forums were identified, based on a number of developers having shared structures, i.e., a courtyard or garage. So far, we have discussed the meeting forums and the creation of contracts to handle these commonalities. During the interviews, the project managers described another type of practice to handle their shared structures, namely jointly hiring project management consultants to be responsible for those parts. To take an example, one block consists of two developers sharing a courtyard and basement, in other words shared structures. They have handled this by hiring a project management consultant to be responsible for the courtyard and basement. One of the developer's project manager described it thus: *"I believe it will be three projects. Where the basement is one and each building its own"* (D1-PM). Their jointly hired consultant reflected on the role, aiming to *"make the best for both developers. Try to see what is positive for one, should also be positive for the other. Or if there is something negative one might unconsciously take that into account. To make it as good as possible for them*

both" (D-CM). The larger developer groups, sharing a garage, have also hired a consultant to manage the garage project.

Apart from creating shared sub-projects and jointly hiring project management consultants to oversee those, the developers' sharing structure also tries to coordinate their technical consultants. Each developer has hired separate consultants for designing the buildings. For designing their shared structures, they choose from the already hired consultants to carry out their joint designs. One project manager said that this simplifies the process: *"we share consultants, we have the same consultants in order not to complicate things. To get as few connection points as possible"* (D2-PM).

4.3. Routines in the project ecology

The four inter-project routines described above show how the developers' relationships have been built up over time. These routines have become part of all the project managers' practices when performing their projects. The routines developed as a way to adapt to each other and the common context. The commonality between all the inter-project routines is that they are a response to the interdependencies created by the municipality's requirements. The routines developed in the void between the strict requirements and decisions from the municipality – which create interdependencies that need to be managed – and the actions that each developer can carry out themselves. Therefore, an interesting balancing act is between what the municipality should and could decide on, and what the developers' project managers are capable of self-organising to achieve coordination.

5. Discussion

5.1. Coordinating in a project ecology

Going back to the research purpose, the discussion will first handle the characteristics of urban development project ecologies. The main characteristics are the self-organising between the developers and the focus on collegiality in horizontal relationships, whereas the vertical relationships (e.g., with the municipality) are characterised by different interests and negotiations. The findings highlight the importance of exploring coordinating practices within project ecologies, since these practices look different in single projects due to different interdependencies and relationships. In a single project context, attention is commonly put on vertical relationships, where formal contracts create a basis for principal-agent relationships. Project ecologies, on the other hand, are characterised by numerous informal inter-project relationships that develop over time, rather than being steered or governed by contracts (Grabher, 2004). While Newell et al. (2008) find that project ecologies can have coordinating challenges due to continuously changing relationships and shifts in power, the present study indicates a potential power in the emerging relationships, for example, in the way the developers have joined forces to create a stronger and unified voice in their dealings with the municipality.

As described in the findings, the developers signalled collegiality rather than rivalry – even though a few larger developers took the lead. Different social logics and cultures can both stimulate coordinating actions, as well as conflict through rivalry (Grabher, 2004). One interpretation of this is that, even though relationships between developers are horizontal, they are not always equal, being different in size and experience etc. Bygballe et al. (2016) discuss how a willingness to adapt to different situations and actors is important for coordinating in a project. The sometimes different interests between developers indicate that this is also relevant outside the vertical relationships, within a project, for the informal horizontal relationships across projects in a project ecology.

Another thought on coordinating in urban development project ecologies is the self-organising between the developers. Ahern et al. (2014) see coordinating as self-organising actions to reach project goals. In project ecologies, the notion of self-organising becomes increasingly

interesting due to the informal character of the relationships. This process of self-organising is clearly visible in the findings through the routines that have developed over time due to a perceived need to manage interdependencies. Accordingly, coordinating through self-organising should not just be seen as important to reach project goals, but also for establishing and maintaining project ecologies. These self-organising practices can be compared to more formalised practices, including portfolio management and project management offices. Portfolio management is suggested as a way to manage multi-project contexts, though it is not applicable in a project ecology because those consist mainly of informal and inter-organisational relationships, not sharing resources or being governed by one organisation. On the other hand, project management offices can be seen as formalised and further developed practice to the gathering and joint outsourcing routines. However, the potential rivalry between the projects might be difficult to manage if the coordinating was extended to that end.

5.2. Inter-project routines to manage horizontal interdependencies

With a developed understanding of project ecologies, the discussion will continue to focus on how routines develop from the horizontal interdependencies that are characteristic of project ecologies. Learning between projects has long been the focus of project ecologies studies (for example Newell et al., 2008). This study broadens the scope of project ecology studies by focusing on routines in ecologies. By using routine dynamics (Feldman & Pentland, 2003), the focus also shifts from actors to actions. Project ecologies would not exist without interdependencies and links (Söderlund, 2004). A focus on practices may help to explain and understand the interdependencies and relationships emerging through social interaction. Moreover, a focus on actors is also central in coordinating studies (e.g., Bechky's (2006) suggestion of enactment of roles), so a practice lens could also widen the understanding of coordinating in project studies. This study's findings highlight how actors perform actions that creating practices – from which routines develop – to handle coordinating issues in the context of where they are acting.

The findings show that developers' rationalistic planning processes are disrupted by horizontal interdependencies between parallel projects. From the analysis of the empirical material, it is clear that the project managers' practices reflect new relationships, i.e., they perform routines as a means to coordinate. Due to horizontal interdependencies, the project managers cannot just lead their own projects in isolation. Instead, the horizontal interdependencies are in focus, which force the project managers into new practices. The new practices may not always be optimal for their own projects, but are necessary to perform their project within the project ecology. The project managers alternate between creating bonds with each other to handle the context and prioritising their own projects. In other words, the project managers' practices are not the same as they would be in a single project context: this is not 'regular' project management.

The finding that routines have developed from horizontal interdependencies is in line with Okhuysen and Bechky's (2009) finding that coordinating can be mediated through routines. In the present case, routines have developed from informal relationships in order to manage coordinating. These inter-project routines have the potential to increase common understanding (Okhuysen & Bechky, 2009). Studies on routines in the context of projects have previously focused on following a single routine (for example Bygalle & Swärd, 2019). In contrast, the present study zoomed out (Howard-Grenville et al., 2016), focused on the context and followed how routines develop from horizontal interdependencies. It has already been suggested that cooperation and relationships are important for routines to develop (Luo, 2002) and the present study confirms this by presenting a context where building relationships is important to manage the context. In more general terms, project ecologies can be of relevance to routine studies. Instead of following routines in continuous organisational contexts (e.g., a firm), project ecologies can explore routines in a dynamic context where new projects mean new

relationships and the possibility to see how routines develop from new relationships.

The findings show that, even though the developers could have seen each other as competitors, they mostly chose a collegial relationship, working together to overcome their joint struggles. Over time, they build social ties and trust when performing their joint routines. This corresponds to Gerwin's (2004) suggestion of 'good spirals', where some initial coordinating actions lead to developing trust, which increases the possibility of further coordinating action, creating new practices. Here, the literature on how to develop routines corresponds with that of coordinating, pinpointing the importance of both social ties and trust (Bygalle et al., 2016; Feldman & Rafaeli, 2002). A project ecology is a great example of this, with a high degree of informal horizontal interdependencies that need to be developed and potentially formalised to manage the context. As DeFillippi and Sydow (2016) find, routines are a coordinating mechanism in project ecologies.

6. Conclusions

The purpose of this paper has been to explore inter-project interdependencies and coordinating in multi-project contexts by using the notion of project ecologies. There are several contributions of this paper. First, it presents and discusses the characteristics of an empirical context that is new to both the project ecology literature and the organisational routines literature, the urban development district. Project ecologies are interesting for the organisational routine literature as it can highlight other relationships from which routines develop, compared to the more commonly studied permanent intra-organisational context. Project ecologies can be useful for routine dynamics, instead of following one routine, see how routines develop over time and space, dynamically.

Second, we contribute to literature on multi-project management, by illustrating the characteristics of the project managers' practices in project ecologies. We found many practices stemming from horizontal interdependencies, as compared to the more commonly studied interdependencies in vertical relationships. The findings illustrate that horizontal interdependencies create informal relationships that develop over time. Horizontal interdependencies create practices that are self-organised rather than steered by contracts, which is more common in vertical (principal-agent) relationships.

Third, our findings also contribute to the growing literature on project management to achieve sustainability, which reports that sustainability require different approaches in project management than the traditional rationalistic ones. Hence, our findings contribute to the development of a 'new school of thought in project management' where sustainability is taken seriously (Huemann & Silviu, 2017). We suggest that a routine dynamics perspective is especially relevant when dealing with horizontal interdependencies in project ecologies facing sustainability challenges.

Fourth, our main practical contribution is that the actions that project managers take cannot only be seen as 'regular' project management practices. The need for horizontal inter-project coordinating is outside project managers' regular focus of steering either intra-organisational relationships or vertical inter-relationships between clients, suppliers, consultants and contractors. Project managers' actions in project ecologies go beyond the engineered and rationalistic routines described in project management guidelines. This finding pinpoints the importance of the informal developing of project management practices discussed in prior literature (Bresnen et al., 2005; Bygalle & Swärd, 2019).

The paper provides an understanding of how inter-project routines are developed in project ecologies. However, this study could be extended in duration in order to gain a better understanding of how the relationships develop over time. To make up for the limited duration of the study and the gathered amount of empirical material triangulation between the different sources have been essential for the study. Furthermore, to avoid applicability issues from a single-case study approach the findings are empirically heavy. The theoretical framework also limits the findings to focus on routines, be applying another

framework other parts of the horizontal interdependencies between projects can come into light.

Through the contributions and the limitations of the study, some future research suggestions come into view. For routine dynamics, a comparative study of different project ecologies could develop the understanding of how routines develop between organisations. Where the temporality of projects can be used to focus on spatio-temporal issues. For multi-project management, the angle of understanding the space between projects can still be further explored, the fuzzy reality from a practice perspective. Project ecologies often exist in one or a few overlapping industries, therefore understanding how heuristics are developed, changed and maintained in the temporary context can deepen the understanding of multi-project contexts.

Declaration of interest

None.

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