



The concept of project space: Studying construction project teams from a spatial perspective

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Abstract

Within this article the concept of space as a social phenomenon is discussed in relation to collaboration and knowledge sharing within construction design projects. Space has been neglected in project literature and we argue for the relevance to introduce a spatial focus in project literature. Through a qualitative study of three construction design project teams, we collected observations and interview data. In order to support collaboration and knowledge sharing in a project design team we found that (a) spatial awareness within a project space becomes relevant, (b) the possibility for all team members to influence the design, the physical presence of the client and a facilitating leadership style creates a trusting working environment, (c) and different perceptions of project space have implications for engaging in the space. A spatial perspective gives new insights in project teams and how space can support collaboration and knowledge sharing.

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1. Introduction

Within this article the concept of space as a social phenomenon is discussed in relation to collaboration and knowledge sharing within construction design projects and we argue for the relevance to introduce spatial theory in project literature.

An important part in the literature on project organizing is the focus on the temporary organization or project, which is a set of organizational actors working together on a complex task over a limited period of time (Bakker, 2010). Projects are usually one-off or highly customized and they operate in multiple cooperative forms with other firms (cf. Packendorff, 1995; Söderlund, 2011). Within project literature the concept of knowledge sharing and learning has often been discussed in

terms of how organizations learn from projects (Bartsch et al., 2013; Engwall, 2003; Scarbrough et al., 2004), how learning occurs between projects (Prencipe and Tell, 2001), and how project team members learn from each other (Bosch-Sijtsema and Henriksson, 2014). Knowledge sharing is defined in this study as the exchange of explicit and tacit knowledge relevant to the team task and involves interaction and communication among team members (Cohen and Bailey, 1997; Lee et al., 2010). Collaboration and knowledge sharing are however also known as complex. This complexity is found in design project teams in the architecture, engineering and construction (AEC) industry that often consist of multiple disciplines which typically represent different organizations and project members that cross technical and sometimes geographical boundaries (Chiu, 2002; Dainty et al., 2006; Gray and Hughes, 2001; Moum, 2010). Furthermore, a large part of the knowledge that has to be shared within such a project is embedded, contextualized, tacit and sticky (Bosch-Sijtsema and Henriksson, 2014; Hatem et al., 2012;

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cf. Von Hippel, 1994), which makes it difficult to share with other disciplines that work in different organizational contexts. Sharing of embedded and contextualized knowledge is often considered to be supported by interaction, face-to-face communication as well as collocation (Newell et al., 2009; Scarbrough et al., 2004). For multi-organizational design projects working with complex tasks within a limited period of time, the environment or space of the project team becomes relevant to study in relation to collaboration and knowledge sharing towards project success. Researchers mention that learning and knowledge sharing takes place as a social-spatial process (Sayer, 1985). While some authors discuss multiple forms of proximity not only geographically, but also constituted by contextual and social factors – space is a social phenomenon instead of a physical phenomenon (Mattes, 2012) and space is constituted through the countless practices of everyday life as much as we are constituted through them (Clegg and Kornberger, 2006).

Space has been studied within an organizational context, and can influence how organizations function (Dale and Burrell, 2008; Kornberger and Clegg, 2004; Taylor and Spicer, 2007). However, literature focusing on organizational space has been allocated primarily to single and long-term organizations, in order to gain an understanding of how physical space impacts performance, how space relates to social relations and how space is experienced (Taylor and Spicer, 2007). Few studies have concentrated on studying projects from a spatial theoretical perspective to gain an understanding of a ‘project environment’ or ‘project space’ in terms of collaboration and sharing knowledge. The emphasis on space in a project-based environment becomes relevant to gain an understanding of space in projects and how a spatial perspective can give insight in project collaboration and knowledge sharing. We study these research questions in construction design projects who work collocated and use concurrent collaboration methods to design a structure.

2. A spatial perspective

To gain insight into the concept of space in projects and how a spatial perspective can give insight in project collaboration and knowledge sharing, the theoretical framework discusses spatial theory.

Spatial theory views space as socially produced and inversely spaces influence people’s behaviour (Lefebvre, 1991; Simmel, 2009). Space is a social construct (Lefebvre, 1991). Lefebvre considered three elements that develop and influence our understanding of space: i) the interpretation of the physical space, ii) our prehistory, pre-knowledge, engagement, our value of the purpose and context, and mental status, and iii) our ability to connect in social interaction. These three elements are dependent on each other and cannot be studied alone. The constitution of a particular space is understood as a combined and reciprocal interplay of material and social interaction (Dale, 2005; Vásquez and Cooren, 2013). Research related to space has been wide spread and focuses on different aspects from sociology, geography and organizational theory.

Topics discussed in spatial geography literature are related to knowledge sharing between project based networks, i.e., project

ecologies are discussed as a physical space network of partners collaborating in projects (Grabher, 2002b). Others have focused on social networks of regional spaces (Reimer et al., 2008).

Space is a growing theme within organizational theory and is discussed from different viewpoints. From earlier reviews on organizational space, three different streams are studied: 1) physicality of space, 2) materialization of power relations and 3) experience of space (Dale and Burrell, 2008; Kornberger and Clegg, 2004; Taylor and Spicer, 2007). Concerning the physicality of space the emphasis in literature has often been on relating space to distance and proximity. Within this stream of research there has been a focus on space as an object, i.e., how a physical workplace impacts performance (Heerwagen et al., 2004; Hau et al., 2010; Kraut et al., 2002). Other studies focus more on implications of geographical and perceived distance and proximity. The concepts of proximity and collocation are perceived as beneficial for collaboration and are related to cognitive, emotional and behavioural elements that improve work processes (Kiesler and Cummings, 2002; Monge and Kirste, 1980; Olson et al., 2002). Proximity is defined by these authors as physical distance between people measured in units. Research on proximity also argues that a shared social physical setting affects the similarity of expectations and experiences of people and the development of a shared territory (Kiesler and Cummings, 2002). There have been a number of studies looking into implications of distance, as well as the use of different communication means like face-to-face or computer mediated communication for project work and construction design projects (see Hatem et al., 2012). Especially in relation to knowledge sharing, collocation has been mentioned as supporting rich face-to-face interaction, development of a shared context and facilitating tacit knowledge transfer (Grabher, 2002a; Kavanagh and Kelly, 2002; Koskinen et al., 2003). Other research state that for innovation and learning, geographical proximity is not necessary, but other factors like social proximity and cognitive proximity become relevant (Mattes, 2012). In the AEC industry, proximity of especially design teams is discussed to support collaboration and knowledge sharing (cf. Evbuomwan and Anumba, 1998; Garcia et al., 2004).

Next to physicality of space, another category of spatial research focuses more on the relation between space and power and studies the impact of architecture and work space in relation to social relations, power (cf. Markus, 1993; van Marrewijk, 2010; Panayiotou and Kafiris, 2011) and organizational control (Dale, 2005). Studies mention that space can give information about power, position and importance (Panayiotou and Kafiris, 2011). Dale (2005) discusses how the material can be a physical extension to control relations and mentions different forms of spatial control through territory development, but also horizontal forms of control such as team-working and peer surveillance, and forms of surveillance via information and communications technologies (cf. Sewell and Wilkinson, 1992).

However, space can also support a social landscape where social relations are mediated through spatial configurations (Halford, 2004). There are studies on how space is experienced and how space is a manifestation of our imagination (Cairns, 2002; Ford and Harding, 2004; Taylor and Spicer, 2007). Studies

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