PROJECT MANAGERS ADJUST THEIR LEADERSHIP:

TO WORKSPACE AND PROJECT TYPE

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Abstract

Purpose (mandatory): the study investigates the triadic relationship between project workspace (i.e. spatial context), project type, and project manager's leadership style. It develops the concept of leadership construct (i.e. mental models of leadership to predispose the way leadership is performed) to explain related preferences for work space and behaviors.

Design/methodology/approach (mandatory): A combination of phenomenological inquiry on preferred work spaces in different project types is combined with a conceptual study on related leadership styles in these settings.

Findings (mandatory): Four different leadership constructs are identified, which are conditioned by workspace and project type: one-on-one, virtual, interactive, and mixed leadership. Also, four leadership patterns are identified, and these are related to open-office and virtual-office settings in product, service, software development, and infrastructure construction projects.

Research limitations/implications (if applicable): The results show the interaction of workspace, project type and leadership styles, which extends existing leadership theory and provides more granularity in determining appropriate leadership styles for project managers.

Practical implications (if applicable): Practitioners benefit from a more conscious selection of appropriate leadership styles, which positively impacts project results.

Originality/value (mandatory): By linking workspace, project type and leadership styles, the study is the first of its kind and a novel contribution to theory in project leadership

Key words: Project management, leadership constructs, workspace, project type

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Introduction

The way project managers lead is contingent of the context where leadership is performed (Frame, 1987; Turner, 1999). In the ideal world project managers would, based on the characteristics of the workflow at hand, select the most appropriate workspace for performing leadership. In the real world, project managers perform leadership across a variety of workspaces as work life has become highly flexible in terms of where work is executed. Project managers are called at the most inconvenient places and times to lead and make decisions on the spot. These 'spots' offer different sounds, scents, visual stimuli and degrees of physical and mental presences of colleagues and other people, which may affect the performance of leadership. This paper looks into the characteristics of the work spaces where project managers lead and explores how these contextual characteristics affect the way their leadership is mentally constructed and performed. Leadership is hereby understood as an interpersonal, person-oriented, and social influence (Endres and Weibler, 2017). Leadership guides in direction, course, action, and opinion. This distinguishes it from management, which is task oriented in the sense of bringing about or accomplishing something, being responsible for, or conducting something (Bennis and Nanus, 1985). The notion of "space"/"workspace" is here associated with the various office environments within which the project managers' leadership unfolds, such as cell, open-plan, home, and virtual office.

At the crossroads of leadership and space lies the concept of "leadership construct". It represents the project manager's mental conception of leading in context, that is, the predisposition of action and style, which is assumed to shape and being shaped by contexts, such as workspace, task, and interaction with others. The present paper conceptualizes the nature and characteristics of the leadership construct. To that end, it will not develop and

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validate a measurement construct for a particular form of leadership, such as done by Amundsen and Martinsen (2014) for empowering leadership. Instead, the study will outline the conceptual principles, which can be used in subsequent studies to develop specific measurement constructs.

The last 10 years showed renewed interest from organizational researchers in the study of space (e.g., Clegg and Kornberger, 2006; Taylor and Spicer, 2007; Dale and Burrell, 2008; Van Marrewijk and Yanow, 2010). The studies were predominantly from a general management perspective and found essential relationships between space and leadership, as well as other effects. With projects being temporary organizations (Tuner and Müller, 2003) it is important to understand the effects of space on leadership in project settings in order to build awareness of these effects and consciously manage them to enable efficient project leadership. Still, little has been discovered about how different project types lend themselves to different contextual settings (Hoegl et al., 2012) and how that affects the leadership of project managers.

The following rather explorative research questions are used to explore whether certain project leadership characteristics may vary as a function of the above mentioned spatial variations:

RQ1: What are the types of spaces project managers work in?

RQ2: What are the preferred spaces for project managers to work in?

RQ3: How do project leadership constructs relate to leadership spaces?

While it has become widely acknowledged that projects vary (Shenhar, 2001), which is mirrored in the number of categorization systems (c.f. Crawford et al., 2004), little has been discovered about how different project types lend themselves to different contextual settings (Hoegl et al., 2012), such as, the role of project types as a criterion for selecting an appropriate

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workspace, or vice versa. Therefore, the following question is raised to explore the relationship between workspace and project types:

RQ4: How do preferred spaces relate to project types?

The unit of analysis is the relationship between the leadership construct, the workspace and the type of project. A qualitative, phenomenological study, using observations and interviews, was done in four Norwegian organizations. The results provide insights into relationships and preferred patterns of choices among office context, project-type and leadership style, all of which are coordinated through the leadership construct.

Knowledge about this relationship increases practitioners' awareness of their externally induced behavior and helps them to focus on project issues and away from context-related behavior. Benefits for academics include extending existing leadership theories to include context variables and thereby augmenting their explanatory power.

The paper is structured as follows: first, it provides theoretical insights related to spatial dimensions of leadership, especially in the context of project work. It presents empirical material describing the settings where project managers lead and analyses how project managers characterize their leadership across various workspaces and across project types. Then it maps the findings to existing literature on project types, and their office requirements and leadership styles. Finally, it offers conclusions and propositions for further research.

Leadership research – a brief overview

There has been a gradual change in the ontological perspectives of leadership research over the last 100 years. These changes are often categorized into schools of leadership, with school representing a particular research view and a number of related theories. Among the oldest ontological perspectives in leadership research are objective views on the traits of managers (as by Confucius), which then turned into styles of managers, such as Turner's seven project manager traits (Turner, 1999). Soon thereafter, contingency theory made its way into leadership research and allowed identifying different leadership styles for different situations. Examples of this include transactional and transformational styles (Bass, 1990), or the team-maturity-dependent styles (Blake and Mouton, 1978). In project management, this is represented by Frame's (1987) or Turner's (1999) leadership contingency on project stage. After that, a more subjective stance was taken by looking at leaders' charisma and later at their emotional capabilities (Goleman, 1995). These approaches then entered the realm of science through objective ontology and quantitative assessments, for example, in general management (Mayer and Salovey, 1997) and in project management (Turner and Müller, 2006).

More subjective ontological perspectives emerged towards the end of the last century, as shown in the special issue of *The Leadership Quarterly* on Authentic Leadership Development (Avolio and Gardner, 2005). These approaches also focused on the exchange between leader and follower. Definitions of the term revolved around these leaders' awareness of their thinking and behavior as perceived by others while being aware of their own and others' values/moral perspectives, knowledge and strengths within context, paired with confidence, hopefulness, optimism, resilience, and high moral character (Avolio and Gardner, 2005). This concept was taken into project management by Lloyd-Walker and Walker (2011) who identified authenticity characteristics required for successful alliance project leadership. In line with the shift towards

less leader-centric perspectives, acknowledgment of leadership's aesthetic and material aspects grew (e.g., Ladkin, 2006, 2008; Ladkin and Taylor, 2010; Hansen et.al., 2007; Ropo and Sauer, 2008; Ropo et al., 2013), where leadership is seen as a felt experience in the "space between" human and material encounters, rather than the effort of one person to influence another (Hansen et al., 2007). This is the perspective used here to illuminate leadership conditions as it helps seeing how aesthetic dimensions such as seeing, touching, listening, rhythm and space can affect project managers' leadership constructs.

In summary, the leadership of project managers is decisive for project success (Nixon, et al., 2012; Turner and Müller, 2005). In particular, the manager's leadership role is salient in motivating the project team members and in creating an effective working environment for the team (Anantatmula, 2012) by adjusting the interaction among team members to the spatial requirements (e.g. in co-located versus virtual teams) (Chiocchio et al., 2015; Bourgault and Drouin, 2009). However, little research is done in this area.

Project space

The role of space has received only very limited attention in the project context, but there is an emerging interest for the impact of space on project work and collaboration, for example how co-location enables co-creation between customers and clients, and how this is particularly in the projects' planning and design phase (Alhava, et al., 2015). Kokkonen and Vaagaasar (2018) shows how co-location is valuable to collaboration across firms in inter-organizational projects, and identify the managerial practices allowing to take full advantage of shared collaborative spaces to support inter-organizational project collaboration. Also, van Marrewjiik and Smiths'

(2014) demonstration of how spatial solutions shape integration and fragmentation among the actors involved in mega-projects. However, these studies, do not explore how space affects the project leadership style.

Conceptualizing the Leadership Construct

This paper introduces the idea that project managers can be assumed to hold mental models about how they should perform leadership, i.e. their leadership constructs, formed by their perceptions of their surrounding and their own acting on these surroundings, which shape the leadership they actually perform.

This means seeing leadership as a dynamic process predisposed by the leadership construct, which is produced through the project manager's social reality (Berger and Luckmann, 1966), within which leadership and the material reality are brought together (Orlikowski, 2007). This idea stems from combining Foti and Lords (1987) theory on implicit leadership with the notion of affordances. Foti and Lord (1987) posits that individuals, both leaders and the people they are to lead, create cognitive representations of the world, and use these preconceived notions to interpret their surroundings as well as to determine own behavior. People have different perceptions of the possibilities offered by the space they find themselves exposed to and makes them actively perform in accordance with these perceptions (Fayard and Weeks, 2007). These possibilities are framed by physical materials and social constructions of behaviour (Fayard and Weeks, 2014). However, Lefebvre (1991) reminds us that practices in space and experiences of space cannot be understood separately. We follow this by studying the connection between project leadership and space.

Project types and leadership

Categorizing projects by their characteristics allows for more differentiation in investigation and understanding. Many categorization system exists, which typically distinguish between project types, such as those with low/high objective clearness and low/high methodology clearness (Turner and Cochrane, 1993), or those that distinguish between industry types of projects, such as engineering, consulting and organizational change (Crawford et al., 2004). Among the studies that related different project types to particular leadership styles are Dulewicz and Higgs (2005), who identified three styles (goal-oriented, involving, and engaging) as being appropriate for different levels of change caused by projects (from low to high). Other writers emphasized the need for demographic styles in New Product Development (NPD) (Sarin and McDermott, 2003), the need for different leadership styles across the phases of a project (Frame 1987; Bresnen et al. 1986). A more detailed overview is provided in the Appendix.

While informative about the dyadic relationship between leadership style and project type, the existing literature falls short of addressing the triangular relationship between space, project type, and leadership. Therefore, an exploratory approach is used in this study to provide a more detailed discussion.

Methodological approach

Along with the nature of the research question and the phenomenological approach selected, an explorative and inductive research design was applied (Eisenhardt, 1989), aiming for the respondents' voices and opinions to be heard (Van Maanen, 1988).

Maximum variety sampling was used in order to identify the most generic patterns of the phenomenon. Data collection was done through interviews with project managers at the Norwegian branches of two multinational organizations; a major international telecom company, and a large IT consultancy, both working to a large extent in projects. The companies were selected based on the following criteria: (a) performing knowledge-based work with high levels of professionalization and autonomy of where and how to work, (b) work is to a large degree project-based, (c) project leaders have extensive experience with different work spaces (both traditional officing, open-plan officing, virtual teams, and hybrid forms). Eleven informants were included (see table 2).

The interviews were guided with open-ended questions in order for informants and researchers to create the text together (Hammersley and Atkinson, 1997). Consistent with the data-near way of working as proposed by, for example, Glaser and Strauss (1967), the interview guide evolved throughout the data collection as analyses nurtured the inquiry process (Dubois and Gadde, 2002). The interviews lasted approximately 1.5 hours each, and included two persons from the research team, one mainly taking notes while the other engaged in informant dialogue. Typical questions included: how much of your working time do you spend in different places and spaces? What are your experiences with these work spaces? How do you perceive being a leader in different work spaces? How do spaces and places affect the way you lead? After the interviews, memos were developed to increase the ability to work back and forth with the empirical material.

Validity was pursued by asking for multiple sources of evidence such as pictures, project documentation, doing physical observation in addition to the interview material (following Yin, 2009), and constant comparison of findings across informants (following Glaser and Strauss, 1967). Reliability was pursued following Yin's (2009) suggestion of an upfront developed interview protocol and cross case validation.

Open coding, as suggested by Glaser and Strauss (1967), was used to inductively develop first-order codes, searching the material for similarities and differences in leadership construct expressions. The research team first made individual independent analyses of the interview material, and then compared and discussed these to identify common concepts and categories. Similar codes were grouped into categories, using informant language (that is, *in-vivo* coding). Table 1 displays an example of analysis of material related to project managers' work space. Development of first-order categories was complemented with linkages to second-order themes that represented theoretical concepts at a more abstract level, thus axial coding (Glaser and Strauss, 1967; Nag and Gioia, 2012). Examples include the three work space categorizations and the four leadership constructs. Analyzing the relationship between certain leadership characteristics, the types of projects, and the space and place within which they emerge was done using ternary diagrams. A ternary diagram is a triangle that shows the proportions of three mutually independent and collectively exhaustive population variables (Graham and Midgley, 2000), for example, the relative amounts of three possible categories of individual elements, which make up a collective population (Plewe and Bagchi-Sen, 2001). Ternary diagrams are frequently used in disciplines such as demography, geography, and chemistry. In project management research, this method was used by Müller et al., (2013) to show the relative role distribution of project management offices (PMOs) in PMO networks. Similarly, we show the

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relative distribution of project management community office usage in the case companies. The use of the three office types is mutually exclusive and exhaustive. Within the three-dimensional office space, the theoretical project type mix can be plotted as a profile. Finally, the identified pattern was considered in light of previous research.

Analysis of project leadership and use of workspace

In general, the interviewed project managers used the work spaces flexibly. They all described working and performing leadership in airports, planes, cars, receptions and other public places mostly processing mails to "pass on information" and "provide answers".

> *It happens that I drive the car to the side and send some mails, because things happen there and then and I need to pass on the information.* (HS, 29.11.12).

The project managers also described their autonomy to work at their residence or leisure homes. Some argued preferring working there due to family duties or because they find it more inspiring:

> *I am more inspired, I sit outside, hear the birds, it is nice and I think I am lucky to have a job where I can work where I want and where I can be inspired.* (HL, 05.12.12).

The project managers all expressed their gratitude for being able to choose among work spaces and the motivational aspects stemming from that. As they worked from different physical places and virtual spaces, the technology mediating them (telephone, Skype, and other web-based meetings) was described as highly important by all interviewees. However, all also warned

about the misunderstandings caused through virtual settings, stemming from the lack of observable body language, facial expressions, and emotional cues.

> *The challenge is that you do not get to see the reactions, when people get insulted and stop contributing, then you don't not know the reason for it. When you have face-to-face communication you get the signals.* (PB, 10.04.13).

The project managers talked about the challenges of activating the team members "out there" and their strategies for doing so, for example, asking the people outside of their room explicitly about their opinions and using their names, and going around the (imagined) table, assigning tasks to all the meeting participants. They appeared highly conscious about these matters:

> *When you have virtual meetings, it is important as a project manager not to talk much, not to talk simultaneously with the people out there as it shuts them out* (ES, 29.11.12).

> *For the participants working virtually, it is easier to disconnect mentally from the meeting. The law of gravity works; the more people there are in the meeting room compared to the ones on telephone, the more "the others" feel outside. This is accentuated by technological, geographical, linguistic, cultural, and religious differences. Then you have challenges as a project manager in leading them.* (PB, 10.04.13).

Interestingly, in all projects, both project managers and almost all project members from the same location were also co-located in an open plan setting, what they refer to as the open project zone. Therefore, the interviews revealed much about the perception of these open plans and the issues of leading in these zones. Most of them talked about trying to spend as much time as possible in the open plan setting:

I spend 70 percent of my total time in the open project zone, because it has to do with the way I like to work, because the persons important to me are there and because I pay a lot of attention to being physically present for my employees. (ES, 29.11.12).

I spend most of my time as manager in the open zone. I am very conscious about it and preoccupied with developing the glue in the project…Sitting in the open zone is very important, when I arrive I say hello to everybody and ask how things are going. The informal communication is very important. (HL, 05.12.12).

They all talked about the open office plan as important as it offers rich possibilities for informal communication and overhearing conversations, which is seen as valuable to catch project challenges and uncertainties.

It is a great advantage to sit in an open zone, because I catch a lot of things. Things I would not have captured elsewhere, either concrete things or things that do not work, bad moods. The unofficial chat. It is incredibly efficient to sit in an open project space for both problem solving, change improvements and operationally. (PM, 05.12.12).

Several managers indicated the positive effect that sitting together has on team spirit and also the difficulties of living with team conflicts in open plans.

There are more emotions in the open zone and it is very visible. Some get easily stressed. It is visible and creates noise. But the open zone also creates a form of energy where you get out things that you otherwise would not get out. (PM, 05.12.12).

The empirical material points to the transitional nature of modern project work life, encompassing a hybrid of places and spaces, where project managers move from setting to

setting. The flexibility to choose when and where to work is extensive and seems valuable for balancing the work-family dilemma and allows for high productivity and dynamic project work.

In general, the favorite work space for the project managers seemed to be co-location in open, flexible offices. They related this to knowledge exchange and motivational aspects, using expressions such as "most efficient", "more fun", "need to be with my people", "when I can feel the summing, then I know we're on the right track", "being together gives me and the team energy". None of the project managers reported negatively about the open plan, and only one of the managers said he preferred working in a cell office.

Since the 1990s, corporations have introduced different types of open plan offices (Becker, 1999; and Vos et al., 1997). While the traditional cell office (for a review of office designs c.f. Becker, 1999) is known for being good for concentrated, individual work and confidential communication, project managers underscored and appreciated the rich opportunities for interaction and communication that the open plan office allows for. Although research has had mixed results (Maher and von Hippel, 2005; Värlander, 2011), one main benefit of open plan offices like work zones (in addition to cost savings), is facilitation of communication (Allen and Gerstberger, 1973; Hundert and Greenfield, 1969; Zhan, 1991) and broader interaction, which contributes to increased information sharing, satisfaction, and productivity (Brennan et al., 2002; Oldham, 1988, Vaagaasar, 2014). However, when work satisfaction, motivation and work involvement are taken into account, these findings are not necessarily verified. Open plan offices are frequently referred to as the place for faceless, interchangeable, and powerless workers who have lost their workplace identity (Elsbach, 2003; Elsbach and Pratt, 2008).

Generally, the interviewed project managers did not support these negative assessments. However, as we will see later, this perception differs across project types.

The positive attitudes of project managers toward open office plans appear to stem from the on-going communication and interaction. As projects are temporary, highly complex arrangements (Davies and Brady, 2000), established to coordinate and integrate multiple activities (Lundin and Söderholm, 1998), these open plan features are highly relevant. Due to its interactive and dynamic character, most project work (Vaagaasar, 2011) seems to lend itself better to team co-location in open and flexible spaces. Even if project members may be co-located in cell offices nearby, walls and doors limit project managers' social contact, communication, and hands-on control (Allan, 1984).

Work space, leadership constructs and leadership function

Table 1 summarizes the project managers' descriptions of their work spaces, leadership constructs (LC), and how this relates to their leadership function.

Insert Table 1 here.

The *one-on-one* LC describes face-to-face interaction in a room. It is characterized by high-level or competence-based, concentrated work, or confidential interaction. Though this, historically speaking, is the most commonly researched work space (c.f. Becker 1997), it is not much present in the empirical material here, and, hence, will not be elaborated further.

The *virtual* LC describes virtual interaction, emphasizing well-functioning technology as a mediator. The managers point to the importance of avoiding misunderstandings due to lack of

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body language, including team members in the discussion and/or forcing them to contribute, and avoiding people multitasking. They describe the importance of structuring the messages so that they become clearer without being intimidating, developing social intelligence such as empathy and listening, and making judgments based on the quantity and quality of the contributions.

The *interactive* LC, to some extent, substitutes team building activities. It is good for sharing knowledge and allows project managers (and project members) to hear about things that are not addressed in meetings. This setting fosters the managers talking with the project members and is suitable for project work as it supports communication and observation of emotions. At the heart of the interactive LC is balancing accessibility and participating in day-to-day problem solving on the one hand and concentrating on the more strategic issues on the other. Accordingly, the managers describe coping strategies, such as working and reflecting on the impact of their own presence, and the need to step outside the zone to concentrate and prevent conflict escalation.

The *mixed* LC emerges when project members and managers are situated in more than one place geographically and use a mixture of different work spaces communicating virtually, in meetings and in co-located offices. This mix is complex because of the potential for subgroup building and rifts. At the heart of the mixed LC is the difficult balance between the headquarters and subsidiaries, and the challenge of subgrouping (people being present in the headquarters close to the project manager and people residing elsewhere).

Next, the relationship between these four leadership constructs and the places where managers perform their leadership will be explored.

Analysis of leadership constructs across work spaces and project types

To analyze the project leadership constructs and their dialogical relationship with work spaces, the analyses first identified the dominant work spaces where leadership takes place and subsequently mapped them against leadership constructs.

Three work spaces for leadership

The analysis of the interviews identified three types of mutually exclusive places for leadership. These are the cell office, the co-located office, and the virtual office. For each of these office types, the project managers' closeness with their team in terms of place and space was identified. Place refers to the actual physical context (the office choice) while space refers to the perceived physical and emotional setting where leadership is performed. Figure 1 shows the results from the interviews. In short:

- Cell offices provide for closeness in terms of place. Having room for only one or a few team members at a time in the project manager's office limits the physical closeness as well as the perceived closeness in space with the entire team at any point in time.

- Virtual offices, in form of home offices or public places, increase the reachability of the team as a whole, thus potentially increasing closeness in space, while simultaneously being constrained to relatively low physical closeness.

- Co-located offices provide for highest levels of closeness in place, and potentially highest levels of closeness in space. However, the latter can span from high to low levels of

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perceived space, depending on factors like leadership style or relationship between project manager and team.

Insert Figure 1 here.

Dominant office choice of project managers leading different types of projects

Next, the dominant office choice as reported in the interviews was identified, first identifying the project types as reported by the interviewee (as demographics) and then ranking their usage of the three offices types in terms of amount of time it was used. Table 2 shows the results. The project types identified were product development, software development, service development, and infrastructure installation projects. Table 2 shows the project types combined with where the managers spent their time.

Insert table 2 here.

It is here argued that the particularities of each of these places (and their associated spaces) have an impact on leadership constructs; thus, it is possible to map certain leadership characteristics to types of projects and the space and place within which they emerge. For that, a ternary diagram is used (see Figure 2). The ternary diagram can be used at different levels, such as project-team level, department, or organization-wide level. This study uses it at the project level to identify possible office usage patterns and associated leadership constructs.

Insert Figure 2 here.

The office profiles of 11 of the interviewed project managers are mapped in the ternary diagram in Figure 3. The results show patterns by project type:

- **Service (SV) and product development (P) projects use primarily co-located offices**. According to the interviewees, this allows for maximum interaction and group development sensitivity. The nature of these projects is the joint development of products or services, which requires interaction and agreement among the team members, as well as mutual clarification of interfaces, functionalities, and joint prototyping of the developed product or service.

- **Software development (SW) projects use primarily virtual offices or a mix of office types.** This allows people to work from home, hotel rooms, or while traveling. The nature of these projects requires defining functional specifications and then concentrated work by individuals to transcend the specifications via programming languages into technical functionalities. This is best done in undisturbed environments, such has home offices to allow for focused and concentrated work.

- **Infrastructure (I) projects, such as the national fiber cable installation project interviewed here, require the coordination of dispersed teams and suppliers.** These projects do not always have an office, as the team is laying cables across the country. Coordination of team members, suppliers, sponsors and other stakeholders requires virtual access for a project manager who is "on the road".

Insert Figure 3 here.

Discussion

This section links the study findings on office type, project type, and leadership constructs to the existing literature. Appendix 1 provides a related mapping of office profiles, project types with the literature on co-location and leadership styles, and the leadership constructs identified in this study.

The two case studies revealed two dominant office profiles: co-located and virtual offices. Product and service development projects were predominantly done using the former, and software development and infrastructure construction projects were used in the latter. An abductive approach (Alvesson and Sköldberg, 2009) was used to identify the commonalities across existing literature and observed leadership constructs. This allowed generalizing the findings towards existing theory, in the sense of Yin (2009). Four leadership constructs were derived,

Co-located office and product development projects

The literature shows ample evidence of the benefits of co-location in these projects, which require informal interaction for shared understanding, clarification of issues and stimulating discussions. Leadership practices in these circumstances emphasize democratic styles, which facilitate communication and focus on people and their relationships. Participative control, which is, granting more authority to the team over time, succeeds all other forms of control over the project lifecycle. Leaders of these projects establish commitment, transparency, relationships, and a learning culture, while at the same time being observant for the developments within the group. (References see Appendix 1).

Co-located office and service development projects

As in product development, the case study findings are supported through ample evidence about the need for co-location in order to build a team's understanding of the service to be

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developed and use quick and informal communication channels. However, leaders of service development projects emphasize a servant style, characterized by informality, accessibility, and helping team members. Moreover, these projects benefit from close collaboration of managers at the project, business, and senior management level. (References see Appendix 1).

Virtual office and software development projects

The interviewees in two organizations pointed towards the need for structure through clearly developed requirements, which are then coded into software functions by developers. Existing literature supports, but also extends this view, by pointing towards other benefits of this approach, such as hiring of best talents irrespective of geography (leading to higher code quality and productivity), leveraging person-hour costs across national boundaries, or use of follow-the-sun models for increased software development speed. Related leadership styles are more directive and structure setting; at the same time, they are empathetic and mentoring towards team members, facilitative of relationship building, and mutual communication in order to keep up motivation and performance. (References see Appendix 1).

Virtual office and infrastructure construction projects

Teams in these projects are co-located while working virtually over a larger geographical area. Both interviewees and literature emphasize the important role of technology (and its quality) for the interaction among the teams as well as the team with the project's stakeholders. This was also underscored by Dave et al. (2015) who proposed that through efficient use of well-functioning technology one can even create a virtual Big-Room, i.e. an impression among the participant of being located together.

Leadership styles vary substantially due to situational contingencies. However, relationship-oriented styles, which, as opposed to task-oriented styles, make use of the project managers'

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emotional intelligence capabilities, are related with the more successful projects. (References see Appendix 1).

The present study is the first to address the relationships between leadership space, leadership style, and project type. Four leadership constructs were identified, each clearly linked to a particular combination of space and project type: a) democratic styles for co-located product development projects in open plan offices; b) servant styles with shared leadership teams for service development projects in open plan offices; c) more directive (structure setting), but also empathetic styles in software development projects in virtual offices; and d) flexible and situation dependent styles, albeit relationship-oriented, in infrastructure construction projects with virtual offices. One leadership characteristic was identified across all project and office types; that is, people (instead of task) orientation for better performance. The analysis above supports the case study findings through existing literature.

Conclusion

This paper has introduced space as a generative force in project management, and explored how space may condition project managers' leadership constructs; this was supported through existing literature.

In the beginning the settings within which project managers do their work (RQ1) was explored, and the empirical material displayed how project managers perform leadership across a mix of work settings both sequentially and simultaneously. Mediated by virtual interaction, managers lead their teams inhabiting public settings and private settings like homes and leisure homes. Still, they do most of their work in open-plan offices. Exploring what space the project

managers preferred to work in (RQ2), the empirical material clearly points to the open office plan as the preferred work space.

The paper indicates that the managers' perceptions of how they lead and the issues they deal with differ according to the space they reported on inhabiting. Here four leadership constructs and their characteristics related to space have been identified. These were: one-on-one, virtual, interactive, and mixed leadership. In other words, project managers develop different mental constructs of what appropriate leadership means in different spatial settings (RQ3).

The last research question explores the relationship between preferred spaces and project types (RQ4). Creating a ternary diagram where each region was associated with a particular leadership construct and mapping of the project managers' office profiles, helped discerning location patterns by project type. Service and product development projects use primarily co-located offices. Software development projects use primarily virtual offices or a mix of office types. Installation projects require the coordination of dispersed teams and suppliers "on the road". This means that the nature of the leadership construct is dynamic and embedded. Finally, the study results were connected to existing literature to link office profile, project-type, and leadership style.

In line with the findings of this study, future research could test the following propositions by use of larger samples, preferably using quantitative studies:

- Project managers prefer open-plan office spaces to cell offices

- Cell offices are the preferred choice when concentrated work is needed

- For projects that require interaction and collaboration, open-plan flexible offices are preferred

- For projects with dispersed resources and temporary need for concentrated work, virtual offices are preferred

- Project characteristics (project type), the office space chosen, and leadership construct are related

Further research could also explore the ways project managers influence their work through deliberate choice and use of different places and spaces in different situations. A similar line of enquiry could address how space affects a project manager's ability to develop leadership skills, such as the emotional intelligence dimensions of self-awareness, sensitivity, and conscientiousness (Müller and Turner, 2010), as well as planning and stakeholder management capabilities (Pinto and Slevin, 1988).

It is worth noting how the project managers point to the importance of their autonomy and flexibility regarding where to work and when. Also, their highly positive attitude towards working in open-plan office plans is noticeable, as there is little research on the topic.

The paper creates a valuable first contribution to the introduction of the role of space for understanding project leadership. Even though space has become acknowledged as a generative force of action and cognition in organizations (in organization science), project management research has not given it much attention yet. Still, findings should not have been treated as conclusive as the sample is limited. The exploration of the relationship between space and project leadership has limitations in terms of the size and nature of the empirical sample, and

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also because a number of highly related issues, such as differences in culture or personality of managers, were not incorporated.

A main implication of the paper is the need for project practitioners, especially managers, to acknowledge that leading across multiple settings affect the way they lead, and accordingly calls for sensitivity in terms of this relationship. It suggests that project managers actively reflect on the nature of the spatial settings in which they best can perform; in other words, how they can use space to perform efficient leadership.

Implications for academics are in the relations between office profile, project type, and leadership style identified in this study. This opens a new path for understanding leadership as a possible effect of space and project type. This new dimension could complement existing studies about the impact of leadership on projects by investigating the possibly mediating effect of space on leadership and success.

The study's contribution to knowledge lies in the identification of a link between leadership space in form of offices, project types, and project leadership. Clear patterns emerged from a first investigation. More research will complement the picture over time.

References

Alhava, O., Laine, E. and Kiviniemi, A. (2015), "Intensive big room process for co-creating value in legacy construction projects", *Journal of Information Technology in Construction* (ITcon), Vol. 20 No. 11, pp. 146-158.

Allen, T. J. (1984), *Managing the Flow of Technology.* Cambridge, Mass.: MIT Press.

Allen, T. J. and Gerstberger, P.G. (1973), „A field experiment to improve communications in a product engineering department; The nonteritorial office", *Human factors*, Vol. 15, pp. 488-498).

Alvesson, M., and Sköldberg, K. (2009), *Reflexive Methodology* (2nd ed.). London: SAGE Publications.

Amundsen, S., and Martinsen, Ø. L. (2014), "Empowering leadership: Construct clarification, conceptualization, and validation of a new scale", *Leadership Quarterly*, Vol. 25 No. 3, pp. 487–511.

Anantatmula, V. (2012), "Project Manager Leadership Role in Improving Project Performance", *Engineering Management Journal, .* Vol. 22, No. 1, pp. 13-22.

Anantatmula, V., and Thomas, M. (2010), "Managing Global Projects: A Structured approach for better performance", *Project Management Journal*, Vol. 41 No. 2, pp. 60–72.

Avolio, B. J., and Gardner, W. L. (2005), "Authentic leadership development: Getting to the root of positive forms of leadership", *The Leadership Quarterly*, Vol. 16 No. 3, pp. 315–338.

Ballard, G. (2008), "The Lean Project Delivery System: An Update". *Lean Construction Journal*, pp. 1–19.

Barcak, G., and Wilemon, D. (1989), "Leadership differences in new product development teams". *Journal of Product Innovation Management*, Vol. 6 No. 4, pp. 259–267.

Bass, B. M. (1990), "From transactional to transformational leadership: Learning to share the vision", *Organisational Dynamics*, Vol. 18 No. 3, pp.19-31.

Becker, F.D. (1999), "Beyond alternative officing: Infrastructure on-demand", *Journal of Corporate real Estate.* Volume 1 No. 2. Institute for Corporate Real Estate. Henry Stewart Publications.

Bennis, W., and Nanus, B. (1985), *"Leaders: the strategies for taking charge"*. New-York: Harper and Row.

Berger, P. L., and Luckmann, T. (1966), "*The Social Construction of Reality*". New York, NY, USA: Anchor Books.

Blake, R. R., and Mouton, S. J. (1978), "*The Managerial Grid*." Houston, TX: Gulf.

Boukis, A. (2013), "Identifying some internal S/F factors of NSD project performance", *International Journal of Retail and Distribution Management*, *41*(7), 531–544.

Bourgault, Mario, and M. B. A. Nathalie Drouin, (2009), "*Understanding decision-making within distributed project teams*." Project Management Institute.

Brennan, A., Chugh, J. S., and Kline, T. (2002), "Traditional versus open office design: A longitudinal field study", *Environment and Behavior*, Vol. 34, No 3, pp. 279-299.

Bresnen, M., Bryman, A., Ford, J. R., Beardsworth, A. D., and Keil, T. E. (1986), "Leader Orientation of Construction Site Managers", *Journal of Construction Engineering and Management*, Vol. 112 No. 3, pp. 370–386.

Brady T., and Davies, A. (2004), "Building project capabilities: from exploratory to exploitative learning", *Organization Studies*, Vol. 25 No. 9, pp. 1601–1620.

Callahan, J., and Moretton, B. (2001), "Reducing software product development time", *International Journal of Project Management*, Vol. 19 No. 1, pp. 59–70.

Carbonell, P., and Rodriguez, A. L. (2006), "Designing teams for speedy product development: The moderating effect of technological complexity", *Journal of Business Research*, Vol. 59 No. 2) 225–232.

Cascio, W. F. (2000), "Managing a virtual workplace", *Academy of Management Executive*, Vol. 14 No. 3, pp. 81–90.

Chiocchio, François, E. Kevin Kelloway, and Brian Hobbs, eds. (2015), "*The psychology and management of project teams*". Oxford University Press.

Clegg, S. and Kornberger, M. (eds.) (2006), "*Space, Organizations and Management, Theory*". Liber and Copenhagen Business School Press.

Conchúir, E. Ó., Ågerfalk, P. J., Olsson, H. H., and Fitzgerald, B, (2009), "Global Software Development: Where are the Benefits?", *Communications of the ACM*, Vol. *52* No. 8, pp. 127–131.

Crawford, L., J.B. Hobbs and Turner, J.R. (2004), "*Project Categorization Systems*". Newton Square, PA, USA: Project Management Institute.

Dai, C. X., and Wells, W. G. (2004), "An exploration of project management office features and their relationship to project performance", *International Journal of Project Management*, Vol. 22, No. 7, pp. 523–532.

Dale, K., and Burrell, G. (2008), "*Spaces of organization and the organization of space*".

Basingstoke: Palgrave Macmillan.

Dave, B., Pikas, E., Kerosuo, H. and Mäki, T. (2015), "ViBR – Conceptualising a Virtual Big Room through the Framework of People, Processes and Technology." *Procedia Economics and Finance,* 21: 586-593.

Davies A, and Brady T. (2000), "Organisational capabilities and learning in complex product systems: towards repeatable solutions", *Research Policy,* Vol. 29 No. 8, pp. 931-953.

Davies, M. C., Leach, D.J. and Clegg, C.W. (2011), The physical environment of the office: Contemporary and emerging issues. In G.P. Hodkinson and J.K. Ford (Eds.), *International Review of Industrial and Organizational Psychology*, Vol. 26, pp. 193-235. Chickester, UK:Wiley.

Dubois, A., and Gadde L.E. (2002), "Systematic combining: an abductive approach to case research", *Journal of Business Research*, Vol. 55 No. 7, pp. 553-560.

Eisenhardt K.M., and Graebner M.E. (2007), "Theory building from cases: opportunities and challenges", *Academy of Management Journal,* Vol. 50 No. 1, pp. 25-32.

Elsbach, K.D. and Pratt, M.G. (2007). The physical environment in organizations. *The Academy of Management Annals*, Vol. 1 No. 1, pp. 181-224.

Endres, S., & Weibler, J. (2017), "Towards a Three-Component Model of Relational Social Constructionist Leadership: A Systematic Review and Critical Interpretive Synthesis",

----

International Journal of Management Reviews, Vol. 19 No. 2, pp. 214–236.

Espinosa, J., Slaughter, S., Kraut, R., and Herbsleb, J. (2007), "Team Knowledge and Coordination in Geographically Distributed Software Development", *Journal of Management Information Systems*, Vol. 24 No.1, pp. 135–169.

Fayard, A. L., and Weeks, J. (2014), "Affordances for practice", *Information and Organization*, Vol. 24 No. 4, pp. 236-249.

Faraj, S., and Sambamurthy, V. (2006), "Leadership in Information Systems Development Projects". *IEEE Transactions on Engineering Management*, Vol. 53 No. 2, pp. 238–249.

Foti, R. J., and Lord, R. G. (1987), "Prototypes and scripts: The effects of alternative methods of processing information on rating accuracy", *Organizational Behavior and Human Decision Processes,* Vol. 39, pp. 318–340.

Frame, J. D. (1987), *Managing projects in Organizations*. San Francisco, USA: Jossey-Bass.

Goleman, D. 1995, *Emotional intelligence*. New York, NY: Bantam books.

Glaser, B.G. and Strauss A.L. (1967), *The Discovery of Grounded Theory. Strategies for Qualitative Research*. Chicago: Aldine Publishing Co.

Goleman, D. (1995), *Emotional Intelligence*. New York, NY: Bantam Books.

Graham, D. J., and Midgley, N. G. (2000), "Graphical representation of particle shape using triangular diagrams: An Excel spreadsheet method", *Earth Surface Processes and Landforms,* Vol. 25 No. 13, pp. 1473–1477.

Hansen, H., Ropo, A. and Sauer, E (2007), "Aesthetic leadership", *Leadership Quarterl*y, Vol. 18 No. 6, pp. 544-560.

Harborne, P., and Johne, A. (2002), "Many leaders make light work in banking innovation projects", *Journal of Financial Services Marketing*, Vol. 6 No. 3, pp. 267–280.

Harborne, P., and Johne, A. (2003), "Creating a project climate for successful product innovation", *European Journal of Innovation Management*, Vol. 6 No. 2, pp. 118–132.

Hoegl, M., and Gemuenden, H. G. (2001), "Teamwork Quality and the Success of Innovative Projects: A Theoretical Concept and Empirical Evidence", *Organization Science*, Vol. 12 No. 4, pp. 435–449.

Hoegl, M., Muethel M., and Gemuenden, H. G., (2012), Leadership and teamwork in dispersed projects. In Morris, P., J.K. Pinto and J. Söderlund; *The Oxford Handbook of Project Management*, Oxford University Press.

Holmström, H., Fitzgerald, B., Ågerfalk, P. J., and Conchúir, E. Ó. (2006), "Agile practices reduce distance in global software development", *Information Systems Management*, Vol. 23 No. 3, pp. 7–18.

Hosseini, M. R., and Chileshe, N. (2013), "Global virtual engineering teams (GVETs): A fertile ground for research in Australian construction projects context", *International Journal of Project Management*, Vol. 31 No. 8, pp. 1101–1117.

Hsieh, K.-N., and Tidd, J. (2012), "Open versus closed new service development: The influences of project novelty", *Technovation*, Vol. 32 No. 11, pp. 600–608.

Hundert, A.J. and N. Greenfield (1969), "Physical space and organizational behavior: a study of an office landscape", *Proceeding of the 77th Annual Convention of the American Psychological Association*, 1. 601–602.

Jassawalla, A. R., and Sashittal, H. C. (1998), "An examination of collaboration in high-technology new product development processes", *Journal of Product Innovation Management*, Vol. 15 No. 3, pp. 237–254.

Jassawalla, A. R., and Sashittal, H. C. (2000), "Strategies of effective new product team leaders", *California Management Review*, Vol. 42 No. 2, pp. 34–51.

Johne, A., and Harborne, P. (2003), "One Leader is Not Enough for Major New Service Development: Results of a Consumer Banking Study", *The Services Industry Journal*,

Vol. 23 No. 3, pp. 22–39.

Kayworth, T. M., and Leidner, D. E. (2002), "Leadership Effectiveness in Global Virtual Teams, *Journal of Management Information Systems*, Vol. 18 No. 3, pp. 7–40.

Kokkonen, A., & Vaagaasar, A. L. (2018), "Managing collaborative space in multi-partner projects", *Construction Management and Economics*, Vol. 36 No. 2, 83-95.

Küpers, W. (2010), "Inter-Place'– Phenomenology of embodied space and place as basis for a relational understanding of leader-followership in organizations", *Environment, Space, Place*, Vol. 2, No. 1.

Ladkin, D. (2006), "The enchantment of the charismatic leader: Charisma reconsidered as aesthetic encounter", *Leadership*, Vol. 2 No. 2, pp. 165–179.

Ladkin, D. (2008), "Leading beautifully: How mastery congruence and purpose create the aesthetic of embodied leadership performance", *Leadership Quarterly*, Vol. 19, No. 1, pp. 31–41.

Ladkin, D. and S.S. Taylor (2010), "Enacting the 'true self': Towards a theory of embodied authentic leadership", *Leadership Quarterly,* Vol. 21 No.1, pp. 64–74.

Lefebvre , H. (1991), *The Production of Space*, Oxford: Blackwell.

Lewis, M. W., Welsh, M. A., Dehler, G. E., and Green, S. G. (2002), "Product development tensions: exploring contrasting styles of project management", *Academy of Management Journal*, Vol. 45 No. 3, pp. 546–564.

Ling, F. Y. Y., and Tiong, J. H. (2008), "Managing large commercial projects with a tight schedule in China: a case study", *International Journal of Project Organisation and Management*, Vol. 1 No. 1, pp. 86.

Lloyd-Walker, B., and Walker, D. (2011), "Authentic leadership for 21st century project delivery*", International Journal of Project Management*, Vol. 29 No. 4, pp. 383–395.

Lundin, R.A., Söderholm, A. 1995, "A Theory of the Temporary Organization", *Scandinavian Journal of Management*, Vol. 11 No. 4, pp. 437-455.

Maher, A., and von Hippel, C. (2005), "The influence of inhibitory ability, stimulus screening, perceived privacy and task complexity on employee reactions to open-plan offices", *Journal of Environmental Psychology,* Vol. 25, No.1, pp. 219–229

Van Marrewijk, A., and Smits, K. (2014), "Projectscapes: the role of spatial settings in managing complex megaprojects. *International Journal of Complexity in Leadership and Management*, *2*(4), 278-292.

Mayer, J. D., and Salovey, P. (1997), "*What is emotional intelligence",.* In P. Salovey and P. Sluyter (Eds.), New York: Basic Books.

Müller, R., Glückler, J., and Aubry, M. (2013), "A Relational Typology of Project Management Offices", *Project Management Journal*, Vol. 44 No. 1, pp. 59–76.

Müller, R., and Turner, J. R. (2010), "*Project-Oriented Leadership*", (D. Dalcher, Ed.). Aldershot, UK: Gower Publishing.

Nag, R. and. Gioia, D.A. (2012), "From common to uncommon knowledge: foundations of firm-specific use of knowledge as a resource", *Academy of Management Journal*, Vol. 55 No. 1, pp. 421-457.

Nixon, P., Harrington, M., and Parker, D. (2012), "Leadership performance is significant to project success or failure: a critical analysis", *International Journal of Productivity and Performance Management*, Vol. 61 No. 2, pp. 204-216.

Norrgren, F., and Schaller, J. (1999), "Leadership style: Its impact on cross-functional product Development", *Journal of Product Innovation Management*, Vol. 16 No. 4, pp. 377–384.

Ochieng, E. G., and Price, a. D. F. (2010), "Managing cross-cultural communication in multicultural construction project teams: The case of Kenya and UK", *International Journal of Project Management*, Vol. 28 No. 5, pp. 449-460.

Oldham, G.R. (1988), "Effects of changes in workspace partitions and spatial density

on employee reactions. a quasi-experiment", *Journal of Applied Psychology,* Vol. 73 No. 2, pp. 253–258.

Orlikowski, W.J. (2007), "Sociomaterial practices: exploring technology at work", *Organization Studies,* Vol. 28 No.9, pp. 1435–1448.

Pinto, J. K., and Slevin, D. P. (1988), "Project Success: Definitions and Measurement Techniques", *Project Management Journal*, Vol. 19 No. 1, 67–72.

Plewe, B., and Bagchi-Sen, S.(2001), "The use of weighted ternary histograms for the visualization of segregation", *Professional Geographer,* Vol. 53 No. 3, pp. 347–360.

Ragatz, G. L., Handfield, R. B., and Scannell, T. V. (1997), "Success Factors for Integrating Suppliers into New Product Development", *Journal of Product Innovation Management*, Vol. 14 No. 3, pp. 190–202.

Ropo, A. and Sauer, E. (2008). Corporal Leaders. In T. D. Barry, and H. Hansen (2008), "*New Approaches in Management and Organization",* London: Sage.

Ropo. A., Sauer E., Salovaara, P. (2013), "Embodiment of leadership through material place", *Leadership,* Vol. 9 No. 3, pp 378-395

Rowlinson, S., Ho, T. K. K., and Po-Hung, Y. (1993), "Leadership style of construction managers in Hong Kong", *Construction Management and Economics*, Vol. 11 No. 6, pp. 455–565.

Sarin, S., and McDermott, C. (2003), "The Effect of Team Leader Characteristics on Learning, Knowledge Application, and Performance of Cross-Functional New Product Development Teams", *Decision Sciences*, Vol. 34 No. 4, pp. 707–739.

Shenhar, A. (2001), "One Size does not fit all projects; Exploring Classical Contingency Domains", *Management Science*, Vol. 47 No. 3, pp. 394-414.

Steele, F.I. (1973), "*Physical settings and organization development"*, Menlo Park, CA: Addison-Wesley.

Song, M., Berends, H., Bij, H. Van Der, and Weggeman, M. (2007), "The Effect of IT and Co-location on Knowledge Dissemination", *Journal of Product Innovation Management*, Vol. 24 No. 1, pp. 52–68.

Stevens, E. (2014), "Fuzzy front-end learning strategies: Exploration of a high-tech company. *Technovation"*, Vol. 34 No. 8, pp. 431–440.

Sunindijo, R. Y., Hadikusumo, B. H. W., and Ogunlana, S. (2007),"Emotional Intelligence and Leadership Styles in Construction Project Management", *Journal of Management in Engineering*, Vol. 23 No. 4, pp. 166–171.

Söderholm 2002. (eds.). *Beyond project management. New perspectives on the temporary-permanent dilemma.* Liber Abstract Copenhagen Business School Press, Malmö, Sweden.

Taylor, S. and Spicer, A. (2007), "Time for space: A narrative review of research on organizational spaces", *International Journal of Management Reviews*, Vol. 9 No. 4, pp. 325-346.

Turner, J.R. (2009). *The Handbook of project based management*. 3rd Ed. New York: McGraw-Hill.

Turner, J. Rodney, and Robert A. Cochrane, (1993), "Goals-and-methods matrix: coping with projects with ill defined goals and/or methods of achieving them", *International Journal of project management*, Vol. 11 No. 2, pp. 93-102.

Turner, Rodney J., and Ralf Müller (2005), "The Project Manager's Role as a Success Factor on Projects: A Literature Review," *Project Management Journal*, Vol. 36 No. 2, pp. 49-61.

Turner, J. R., and Müller, R. (2006), *Choosing Appropriate Project Managers: Matching their leadership style to the type of project*. Newtown Square; USA: Project Management Institute.

Vaagaasar, A.L. (2014), A spatial perspective to leadership in knowledge intensive projects, in *LEADERSHIP, SPACES AND ORGANIZING*, (eds.), Ropo, A., Salovaara, P., DePaoli, D., and Sauer, E., Edward Elgar Publishing, Forthcoming.

Vaagaasar, A.L. (2011), "Development of relationships and relationship competencies in complex projects", *International Journal of Managing Projects in Business,* Vol. 4 No. 2, pp. 294-307

Van Maanen, J. (1988), *Tales of the Field. On writing Ethnography.* University of Chicago Press.

Värlander, S. (2012), "Individual flexibility in the workplace: a spatial perspective", *Journal of Applied Behavioural Science*, Vol. 48 No. 1, pp. 33–61.

Vos, P.G.J.C., van Meel, J.J., and Dijks, A.A.M. (1997), *The Office, The whole office, and nothing but the office.* BMVB. Delft University of Technology. The Netherlands.

Van Marrewijk, A. (2007), "Managing project culture: the case of Environ Megaproject", *International Journal of Project Management*, Vol. 25 No. 3, pp. 290-299.

Van Marrewijk, A.,and Yanow, D. (eds.) (2010), *Organizational Spaces: Rematerializing the workaday world.* Cheltenham: Edward Elgar.

Yin, R. K. (2009). *Case Study Research: Design and Methods* (4th ed.). Thousand Oaks, CA, USA: SAGE Publications.

Zahay, D. L., and Peltier, J. (2008), "Interactive strategy formation: Organizational and entrepreneurial factors related to effective customer information systems practices in B2B firms", *Industrial Marketing Management*, Vol. 37 No. 2, pp. 191–205.

Zander, L. Mockaitis, A.I. and C.L. Butler (2012), "Leading global teams", *Journal of World Business*, Vol. 47 No. 4, pp. 592-603.

Zhan, L.G. (1991), "Face to face communication in an office setting: the effects of position, proximity and exposure", *Communication Research*, Vol. 18 No. 6, pp. 737–754.

List of tables and figures

Table 1

	Leadership			
	Characteristics of performed leadership	*Good for (pros):*	*Not good for (cons)*	*Mental constructs*
Cell office (one-to-one)	Personal Focused work Confidentiality	Privacy and sensitive subjects	Information sharing (with the team)	Coaching
Virtual	Factual Structured task execution Formal (development of documents, discipline in	Multi-disciplinary teams Status meetings	Observation of informal cues. Motivation of team Relationship and trust building	Setting structures Clarification of issues More transactional in

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			Creative tasks	nature
Co-location (Interactive)	Creativity Information sharing Relational working Knowledge integration	Interdisciplinary teams Motivate team Placing people together by joint tasks Workshops/ ideating Flat team structure Easier to prioritize and follow-up Efficient surrounding for immediate support of people	Personal or confidential talks Avoid groupthink and social desirability effects Conflicts between people	Socially intelligent leadership • Empathy: possibility to understand and see things from others' perspective. Get to know what you do not know to ask about. Informal cues Emotionally intelligent leadership: • Sensitivity: experience the mood, energy, and get to know about the small issues. Shows power: physical presence
Mixed	Use several offices simultaneously Flexibility Requires standardized and reliable	Less need for frequent coordination (compared to interactive) Has the advantages of respective office type at each end of the communication	Has the advantages of respective office type at each end of the communication setting, limited by virtual constraints (needs more structure) "Law of gravity"	Demands the social and emotional intelligence of the leader Leadership constructs differ by space and may differ when PM moves from one

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	technology	setting, limited by virtual constraints (needs more structure) - Gives the best of knowledge from the interactive setting	(bigger group dominates)	space to the next (e.g. from elevator into open office space)

Table 1, Summary of pros. and cons. of leadership in different work spaces. Through the analysis, we identified four leadership constructs (LC): one-to-one, virtual, interactive, and mixed.

Table 2.

Interview nr.	Project characteristics: type, size, industry etc.	Personal office (high, medium, low)	Co-located office (high, medium, low)	Virtual office (virtual meetings- (high, medium, low)
1	Telecom, Consolidation Client Reskontro, 40 people, 15 No – 25 India	Low 10% (quiet room/home)	Medium 40%	High 50%
2	Telecom, Fiber development, Norway, 110 people	Low 5% (quiet room/home)	High 70%	Medium 25%
3	Telecom, Product development services, 23 people	Medium 25% (quiet room/home)	High 50%	Medium 25%

4	Telecom, Fiber installation, 30 people	Low 5%	Medium 25%	High 70%
5	Telecom, Banking services, 25 people	Low 20%	High 50%	Medium 30%
6	Telecom, development, IP network, 85 people	Low 10%	High 50%	Medium 40%
7	Telecom, digital services, 30 people	Low 10%	High 50%	Medium 40%
8	IT consultancy, transition project 100 people	Low 20% (incl. travel)	High 50%	Medium 30%
9	IT consultancy, software development, 32 people	Low 20%	Medium 40%	Medium 40%
10	IT consultancy, Product development, 15 people	Low 10%	High 60%	Medium 20%
11	IT consultancy, software development, 30 people	Low 10%	Medium 40%	High 50%

Project type: I= Installation, P= Product development, Sv = Service, SW= Software development

Table 2: Project types and choice of office usage
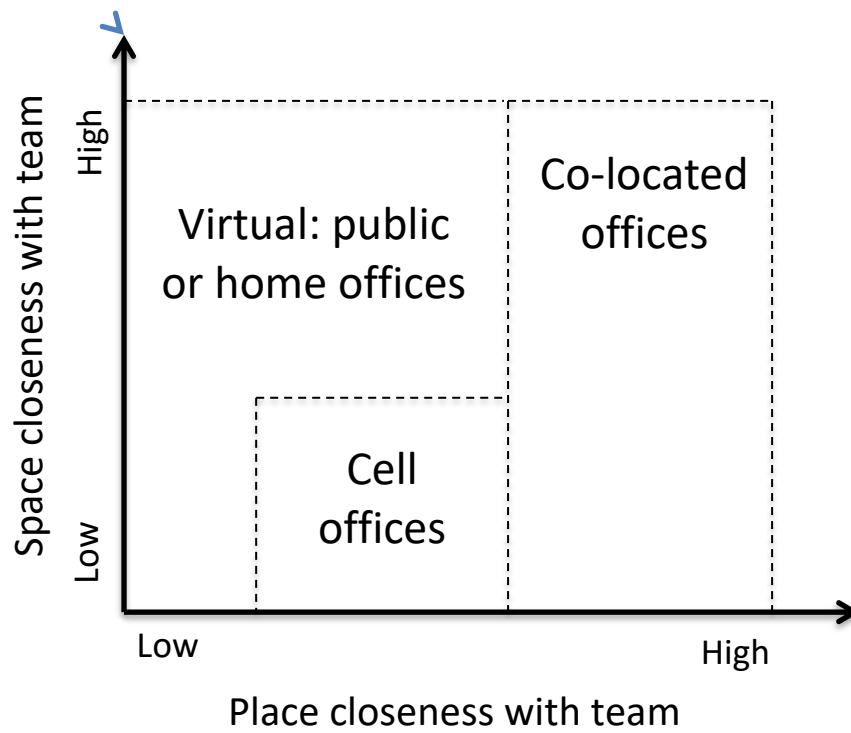
Figure 1,

Figure 1: Closeness of place and space in different office types

Figure 2.
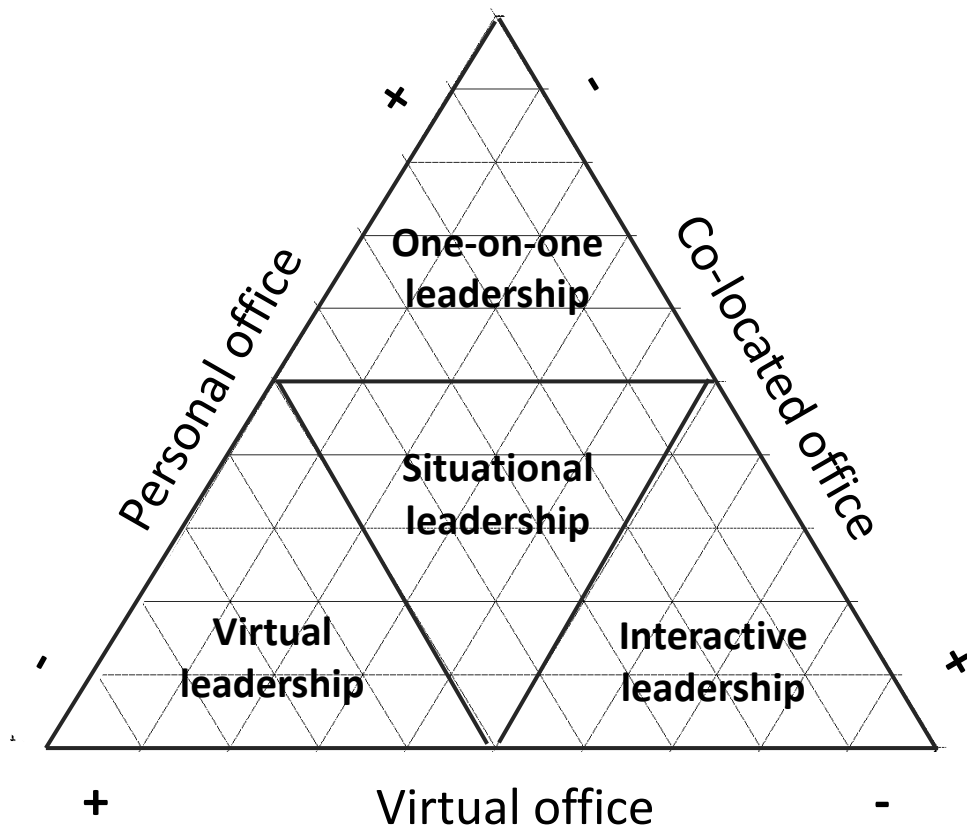
Figure 2: The leadership construct triangle

Figure 3.

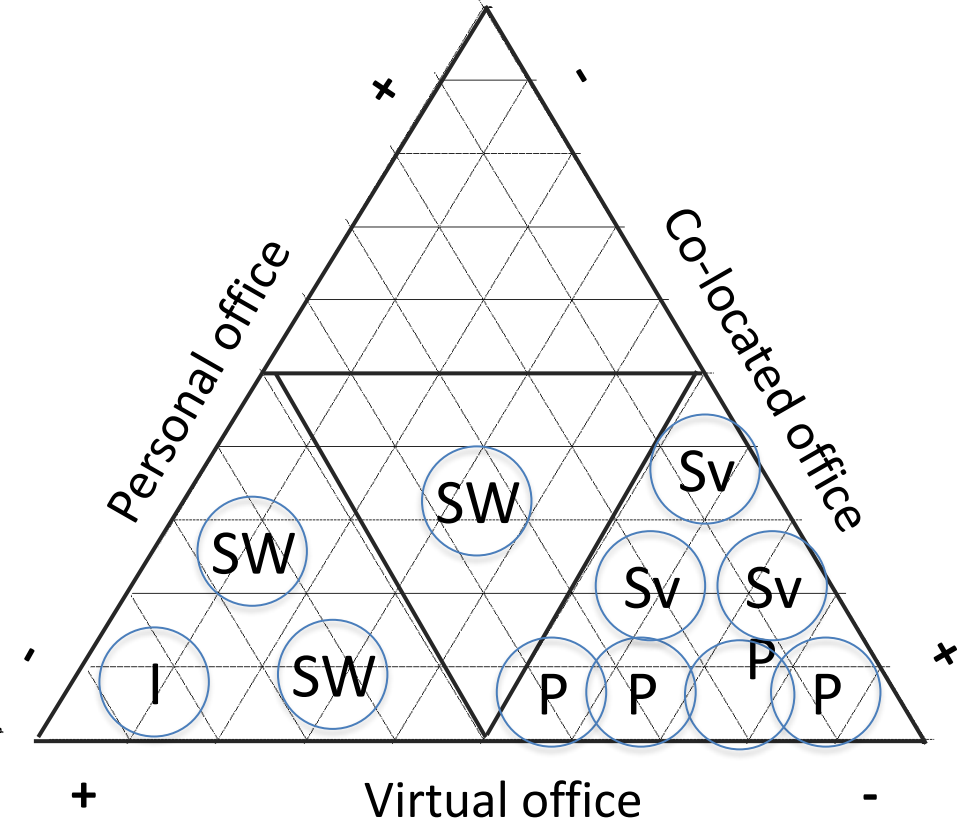Figure 3: The office profiles of the projects

Office profile	*Project type*	*Co-location literature*	*Leadership style literature in the respective project type*	*Leadership construct in the cases*
Co-located office				
	Product development	*"Co-location has a significant positive influence on project success."* In particular, attainment of time and budget goals is improved. (Hoegl and Proserpio, 2004; Gemuenden et al., 2005, p. 371). "Effective leaders also co-locate team members." (Jassawalla and Sashittal, 2000, p. 40). Integration of work through co-located informal work practices and joint decision making (Jassawalla and Sashittal, 1998) especially in technologically complex projects (Carbonell and Rodriguez, 2006). Co-location is used in the more successful NPD projects (Ragatz et al., 1997). Co-location facilitates control (Hoegl and Gemuenden, 2001). Co-location enables	The more successful NPD leaders use democratic leadership styles (Sarin and McDermott, 2003). Leadership roles include communicator, climate setter, interface to other organization levels (Barcak and Wilemon, 1989). Employee-centered leadership is better than product- or change-centered (Norrgren and Schaller, 1999). Effective leaders in NPD projects "ensure commitment, transparency, act as facilitators, strengthen the human relations, foster learning" (Jassawalla and Sashittal, 2000, p. 48). Successful NPD managers use participative control in their leadership style (Lewis et a.,	Collaboration is needed for joint development of new products for mutual clarification of interfaces, functionalities, and joint prototyping of the developed product. Hence it requires interaction and agreement among the team members. Leadership requires sensitivity for developments within the team and the interfaces among teams, as well as their interactions.

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knowledge dissemination (Song et al., 2007). 2002).

Co-location facilitates product development (Zahay and Peltier, 2008)

(NPD = New Product Development)

Service development	New service development projects (NSD), "are characterized by denser communications and the co-location of different functions and suppliers." (Hsieh and Tidd, 2012, p. 601). Co-location supports the development of new banking services (Harborne and Johne, 2002). NSD demands info exchange and close collaboration. Higher cross-functional integration will improve NSD project performance (Boukis, 2013). Proximity needed for problem solving (Stevens, 2014).	Servant leadership of a team of leaders, with senior, business and project leader. Hands-on leadership, with high levels of informality and an open door policy, is more beneficial for NSP projects than control (Harborne and Johne, 2002; 2003). Co-leadership of at least three types of leaders is needed in NSP projects: senior, business and project managers. "The senior leader is responsible for overall strategic direction and is typically the CEO. The business leader is responsible for selection of projects and is typically the head of a business unit. The project leader is responsible for delivering specific project objectives." Their interaction is crucial for sharing values (Johne and Harborne, 2003, p. 25).	Similar to NPD projects, but with stronger emphasis on interface management and shared leadership.

Virtual office				
	Software development	Co-location is not supportive of SW development projects (Callahan and Moretton, 2001). Virtual offices are chosen for many reasons, such as: the advantage to recruit best-skilled, high-performing professionals, leading to higher code quality (Holmström et al., 2006), reduced salary costs, time zone effectiveness through "follow-the-sun" models, leading to greater innovation, learning, and transfer of best practices (Conchúir et al., 2009). Negative effects of geographic dispersion are offset through shared knowledge of the team (rather than the task) (Espinosa et al., 2007).	Directive leadership correlates with team performance, except for cases of high task uncertainty or team experience (Faraj and Sambamurthy, 2006). Effective leaders act empathetically, while at the same time being able to assert their authority without being perceived as overbearing or inflexible. They provide regular, detailed, and prompt communication and articulate role relationships and responsibilities among the team (Kayworth and Leidner, 2002) (Anantatmula and Thomas, 2010). Most effective leaders shift from focus on time to focus on results (Cascio, 2000).	Setting structure through definition of functional specifications, followed by team members work to transcend specifications via programming languages into technical functionalities. This is preferably done in undisturbed environments, for example home offices, for focused and concentrated work.
	Infrastructure projects	Effectiveness of project management is improved through virtual project offices, spanning geographies and organizational borders (Dai and Wells, 2004).	Infrastructure projects require different leadership styles in different phases. However, common across all phases is a relationship orientation. "Emphasis on relationships […] is more likely to enhance project performance	Teams in infrastructure projects are co-located, albeit working virtually (for example, laying

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Co-location improves productivity (Hosseini and Chileshe, 2013) through better communication and face-to-face discussions (Ling and Tiong, 2008).

Challenges in achieving sustainability require co-location and other social innovations for collaboration (Ballard, 2008).

than an emphasis on tasks" (Bresnen et al., 1986, p. 370).

Emotional intelligence (EI) of the project manager leads to proactive leadership styles with open communication (Sunindijo et al., 2007). Here the EI dimensions of conscientiousness and sensitivity correlate with construction project success (Müller and Turner, 2010).

Multicultural teams in construction projects require empathy on the side of the project manager (Ochieng and Price, 2010) and more relationship-oriented leadership in Asia than in the west (Rowlinson et.al., 1993).

cable across the country) without a permanent office.

Leadership style is situation-dependent. However, the exposed nature of the team as a standalone entity puts emphasis on relational leadership.

Coordination of team members, suppliers, sponsor and other stakeholders communication technology for virtual work.