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Part II

The Knowledge Worker

A Rising Number of Knowledge Workers

This Chapter investigates RQ1: *How can governing bodies in organizations of knowledge worker teams understand and steer multiple knowledge worker project teams in practice?* The attempt to provide a potential answer will be supplemented by the answers from Chapters 6-12. In order to make RQ1 suitable for our field research we formulated two subquestions RQ1a and RQ1b. RQ1a: *How do senior managers foresee the change in interpersonal relations in knowledge worker organizations?* RQ1b: *How do senior managers aim to address these changes?* As we see it now, information and communication technology, ICT, has introduced new styles of working. The virtuality of the styles has impact on how employees within an organization perform their task and how they interact with colleagues, clients and supervisors, but so far the impact is not yet well understood. 24 board level executives from 18 Swiss knowledge firms have been interviewed about virtual work arrangements and the change they bring in networking dynamics within their organization. After a careful analysis and discussion we have identified emerging issues and formulated five possible recommendations suggested by our respondents.

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¹The author would like to thank IEEE and his co-authors for permission to reuse relevant parts of the article in this thesis.

3.1 Collaborative Knowledge Work

A core theme of the our research is collaborative work and its virtual organization. In this chapter we report on a field work study with 24 board level executives from 18 Swiss knowledge firms. In the summer of 2010 we presented a one-page scenario paper (Barzilai-Nahon & Mason, 2010) to the executives (similar to B. Katzy, Zhang and Löh (2005)) and asked the interviewees for their feedback. In order to get unfiltered views, we did not ask structured questions but left the initiative to the interviewee. This resulted in interviews that on average lasted 90 minutes and led to a total of 650 pages of transcripts, discussing to what degree collaborative work has emerged from insider discussions at academic conferences to board room attention.

One recurring theme addressed by the interviewees is the *emergence of new organizational arrangements and their impact on the way individuals perform their day-to-day job*. The driver is a rapidly increasing number of relationships to colleagues, co-workers, clients and supervisors. This chapter adopts Granovetter's (Granovetter, 1983, 2003) perspective on networks as configuration of weak, strong and absent ties as its analytical theoretical lens. The aim of this chapter is an analysis of how these senior managers foresee the change in interpersonal relationships and how the balance will be divided between strongly tied groups and groups based more on the essence of weak ties (see Section 3.2). We review how they perceive the support of information technology for virtual work arrangements. With the fresh memory of assumptions that programs like the European FP 6 Collaborative Work Environment (CWE) program and its projects (e.g., CoVES, COSPACES, or ECOSPACE) made, we aim at contributing to understanding adoption of flexible collaboration environments as well as review requirements for their design and engineering (see Section 3.3).

A second recurring theme addressed by the interviewees is the *perceived higher dynamics or frequency of change in interpersonal relationships and their ties in organizations*. We therefore are particularly interested in the interrelation dynamics between people and how groups based on weak and strong ties shape organizational structures and processes as the interviewees in the initial round of the interviews addressed them. Senior executives, whose responsibility is to create effective work arrangements and organizations, have expressed their interest in the changing nature or organizational arrangements. Based on reviewing how they perceive the support of information technology for virtual work arrangements, we point out how this relates to existing literature (see Section 3.5).

3.2 Increasing Relationships in Knowledge Work

Researchers have repeatedly described pictures of future collaborative organizations (Lipnack & Stamps, 1997; Igarria, 1999; Igarria & Tan, 1998; B. Katzy et al., 2005; Schaffers, Brodt, Pallot & Prinz, 2006; Prinz, Jeners, Ruland & Villa, 2009; Sari, Loeh & Katzy, 2010) especially

in response to the adoption of information and communication technology and virtual environments in which time, location and connected devices no longer matter because all are available anytime anywhere. This emergent innovation age affects not only the private space but also businesses. Early signs of this evolution were work-from-home approaches that increasingly develop to more encompassing virtual work styles and work-anytime-anywhere strategies. Suppliers of enabling technology (Microsoft, 2005; SPS, 2010) incorporate these trends in their product and technology roadmaps for virtual workplaces, New Ways of Working, or Work 2.0. Still, there remains doubt on how new ways of work actually affect work effectiveness in practice. With the increasing adoption the need emerges to analyse the implications on practice.

Granovetter (1983) defines three types of such ties that connect actors, or a group of actors in what he calls a clique. Strong ties are bonds that represent contact-intensive and tightly knit relationships that a person has with close friends, family and colleagues. These are opposed to weak ties, which refer to acquaintances with less social involvement, more superficial and on a smaller, less intimate basis. Links in social software platforms fall in this category. Absent ties are between people with no relationship to each other. The argument of Granovetter (1983) is that the main benefit for weak ties lies in the linkage of information between multiple networks. They are ties that can establish a relationship between two strongly tied networks, for example, two departments within an organization, or two organizations via a boundary spanning weak link as summarized in Figure 3.1. An example would be a person within the first network who is acquainted with a person of the other network. This effect is similar to what is frequently referred to as network-broker concept (Fernandez & Gould, 1994; Mowshowitz, 2002; B. R. Katzy & Crowston, 2008) meaning that a specific weak tie forms a bridging factor between two or more socially separated networks.

Weak ties have been found important in transmission of knowledge between coherent groups (Granovetter, 1983, 2003; Maric, 2014), however, research indicates that strong tie networks are considered favorable for solving of complex problems (M. T. Hansen, 1999; M. Hansen, 2013).

Each tie group, be it strong or weak, comes with certain set of components, both static and dynamic, defining the strength of a tie. As proposed in Granovetter's (Granovetter, 1983, 2003) theory there are four components defining the strength of a tie in offline situations: the amount of time spent together, emotional intensity, intimacy, and reciprocal services. Research on the impact of new media on (existing) tie strengths indicates (Haythornthwaite, 2001) that positive effects may be seen for strong ties when the new medium provides further means and opportunities for contact and complementing existing communications methods, or for weak ties when the medium increases connectivity among otherwise unconnected individuals. Where ties are strong, maintained via multiple media, the impact will most probably be small; where ties are weak and maintained via one medium, the impact may be disintegrative for existing connections (Haythornthwaite, 2001).

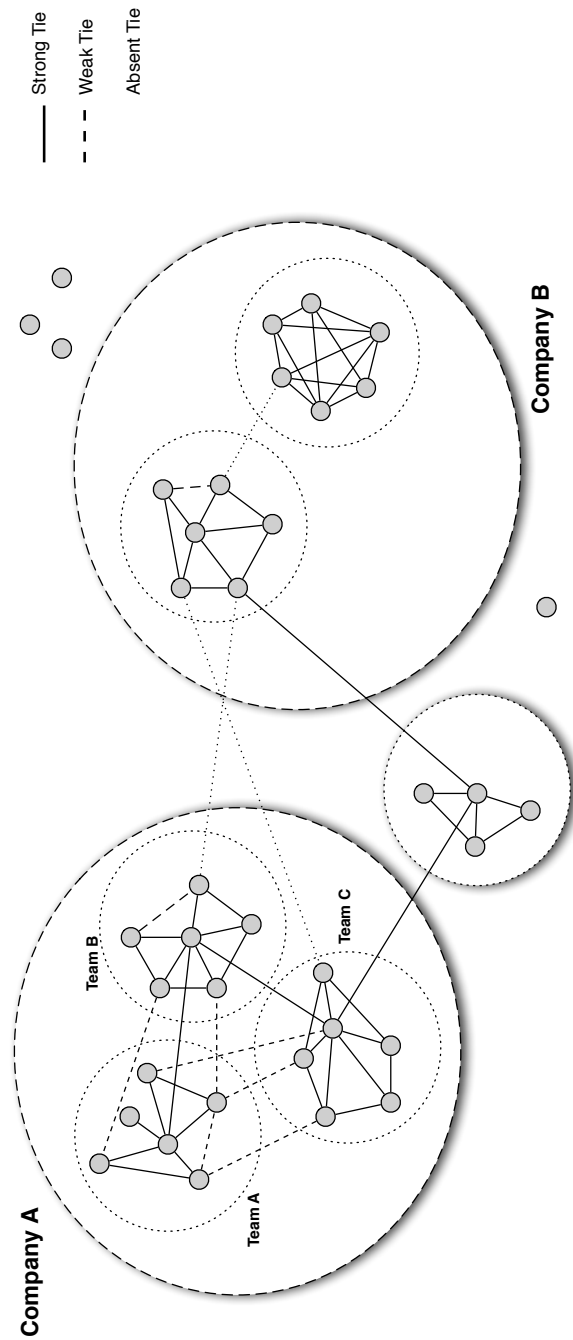


Figure 3.1: Two companies and a freelance team connected via strong and weak ties

Based on the current state of art we thus pose the two following subquestions:

- *RQ1a: How do senior managers foresee the change in interpersonal relations in knowledge worker organizations?*
- *RQ1b: How do senior managers aim to address these changes?*

3.3 Methodology: an Exploratory Study

As we want to understand how senior managers perceive change in interpersonal relationships and ties in organizations in an exploratory manner, we have chosen an interpretive approach to understand social life and the meaning people attach to it (Schurink & Schurink, 1998). Using qualitative interview data, gathered in summer 2010, we used grounded theory (Strauss & Corbin, 1990) to generate our insights into the phenomenon of network dynamics in virtual work environments.

The recorded interview sessions were transcribed, if necessary translated and imported into ATLAS.ti for qualitative data analysis. The analysis of the primary data material occurred in three coding phases: open, axial, and selective (Ghauri & Grønhaug, 2005). Via open coding of the research data we have formulated a series of categories from both literature and from the interview respondents themselves that describe the impact on strong, weak and absent ties as a result of moving towards a virtual work arrangement. The open coded interviews were ranked via axial coding and, where necessary, reduced coding categories to become mutually exclusive and commonly exhaustive. Finally, via selective coding we assessed the relevance of the coding categories and we summarized the common ideology based on the conclusions from all categories used in the coded primary material.

3.4 Characteristics: New Ways of Work in Knowledge Work

The interview coding process led to the definition of 16 unique codes. After a careful analysis and discussion we have chosen four emerging issues and five possible recommendations to be discussed in this chapter. In the following section we will discuss the four emerging issues as addressed by the interviewees.

3.4.1 A movement towards weak tie relationships

The respondents perceive that the relevance of weak ties for knowledge work has increased and has reached relevance that in Granovetter's theory are attributed to strong ties only. Weak tie relationships are considered dependent on the medium of relationships. Platforms such as Facebook and LinkedIn allow these types of relationships to stay longer connected to each

other. *“But what we see is that next generation of people coming in is obviously very addicted to the use of social networks and whatever Facebook and LinkedIn and other sites that have become part of the personal lives and also seem them as part of their professional lives.”*, as one of the interviewees remarks.

Through social software and the Internet, knowledge resources are globally accessible and it seems more important to find the right sources quickly than to develop one's own solutions. The respondents perceive that within their organization interpersonal relations shift, making the physical relationships one that maintains with their direct colleagues and supervisors more superficial. One manager expresses his perceptions on the changing relationships, Digital Natives, or the Millennials, yes I think that is their daily bread, how they work together, how they communicate with each other, how they interact. It is some kind of a clash of generations. This has consequences for the design of work environments in that only openness for inter-organizational relationships and exchange will allow for high knowledge work productivity.

3.4.2 Impact of weak tie increase on the infrastructure

In the perception of executives, knowledge workers are aware of the relevance of weak ties for their own professional development while corporate organizational structures are still mostly based on strong ties. This results in perceived loyalty problems for the employer. The respondents perceive that the young workforce just entering organizations has a different work style than the current operative workforce. They are considered to have a more nomadic work style, using different technological tools for communications and collaborations like instant messaging and Facebook. *“They do not use the intranet, if you really want to reach someone, then it must be the Communicator, or at best via Facebook over the private page. We really noticed, if we want to reach them than then we really have to do it via Communicator, SMS or somehow. We need to use their channels.”*, states the head of vocational training of a major telecommunications provider.

They are spending time on social media websites to follow and update on private and corporate proceedings. According to the interviewees, this leads to a decrease in loyalty towards the employer, resulting in employees that tend to be more loyal towards their network of peers than towards their network of authority. This forms a dilemma for organizations because employees tend to shun corporate policies for sharing corporate information online with their peers and, in addition, they can easier leave a job or certain position if it suits them. *“I think that is coming. You need a chief social media officer, someone who takes care of these things.”*, a HR manager comments.

Moreover, the increase in weak ties affects organizational processes and structures, as they currently tend to be based on strong tie linkage of departments to supervisors to board level executives. The respondents feel that hierarchies as they currently exist in business, no longer work for the next generation of workers who prefer weakly tied alternatives. *“They*

are less hierarchically organized, I believe many companies [...] they are more flat, a bit like Google, more dynamical building workgroups.”, says a development manager. A similar topic of discussion among the respondents is that of organizational processes. Similarly like organizational structures, organizational processes tend to be based more on the essence of strong ties rather than weak ties. Meaning that such processes are mostly consisting of a static fixed set of steps/activities in order to get from input to output.

3.4.3 Weak ties require different working models

Work processes based on weak ties require different working methods as traditional process management is largely based on strong ties. Concurrent and agile engineering models (Dybå & Dingsøyr, 2008a) could serve as an example for such working methods. What emerged in the engineering domain is perceived to be applicable for knowledge work at large, in different industries as well as in different functional departments. Moving from concurrent engineering into concurrent enterprising, future research needs to generalize theory on knowledge work.

The respondents believe that offering virtual tools and incentives help them being more attractive as an employer towards knowledge workers, whether it's (1) the allowance of social media websites, (2) nomadic or flexible work styles or (3) other forms of virtual collaborative incentives. According to the respondent they believe that knowledge workers want to be provided with such tools that help them facilitate weak tie investments. One manager states, *“Well, we believe we have learned from those and we also believe that there are people like young engineers and like they talk about who entered a company and that is the normal way of organizing their social life, so you cannot just shut that down for them. We would not be an attractive employer if we do that.”* Young knowledge workers tend to appreciate such technological tools as virtual work incentives in such a manner, that they are willing to pay a premium in the form of a job function and salary to get into the environment that does offer them such benefits. The respondents state, for example, that the next generation workforce tend to use their own type of privately downloaded tools or online search engines to get information or perform steps in a process cycle rather than the ones paid and maintained for internally. *“If you compare it to a period of 20 years ago without doubt, without doubt, they are using different kind of IT tools. They are used to look for information on the Internet.”*, one manager responds.

3.4.4 Changing structural dynamics of weak ties

Weak ties introduce dynamics that strong ties do not have. For example they are active for short periods of time only. The regular habit of switching (Mowshowitz, 2002) and favoring of temporary relationships is based on explicit rather than implicit agreements. Knowledge work environments, thus, not only are perceived to increase efficiency of pre-structured processes, but also need to focus in particular on supporting the new organizational dynamics, unusual in

their virtual as well as in their flexible character. While Granovetter's approach prepares for the structural dynamics, it does not model dynamics explicitly.

Overall the respondents perceive that frequency will increase through rapid collaboration between individuals when operating on a virtual collaborative basis. *"Collaborating and online collaboration will have a very important role to people that are in fixed locations and try to work more and more from home or wherever they. We will spend less time in our offices and a large number of cases can collaborate in this context [...] and they will have to develop skill sets and how to keep in touch with their colleagues and enter the projects that they are working on."*, as one participant responds. Within virtual work arrangements the means to collaborate across time and space has allowed to quickly connect and disconnect between partners because transaction costs will be lower (Neus, 2001).

Now we can answer RQ1a: *"How do senior managers foresee the change in interpersonal relations in knowledge worker organizations?"*. From our analysis above, we may conclude, that senior managers perceive (1) a move towards weak tie relationships, (2) shift away from hierarchies towards more dynamic work groups, and (3) they perceive the necessity to adapt ways of working.

3.5 Discussion and Recommendations

In order to manage the increase of weak tie relations and their structural dynamics the respondents mention a variety of options. In this section we summarize the emergent options as applied by our respondents into five concepts in alignment with existing theories.

3.5.1 Organizational Openness

'Open' organizations tend to aim at sharing knowledge both internally and externally thus brokering knowledge among individuals and inter-company networks. The respondents perceive that the increase in weak ties will lead organizations to facilitate knowledge exchange among stakeholders. We have seen that knowledge workers tend to do something they 'like' and something that motivates them. One respondent initiative lets employees submit ideas via an idea management which is well received by employees, *"The idea management we have works in this way, you basically enter your idea and everybody sees that idea and can actually act on it. They are like oh thats good, I like that. And I will help if you try to do that and there is a board looking at those ideas regularly which goes like oh this is a small idea, this is a major idea."* Thus engaging knowledge work via employee-based approaches with an open style of communication letting, them develop ideas on their own in entrepreneurial spirit, is a possible opportunity.

3.5.2 Result Driven Agile and Concurrent Development Models

Result-driven management and goal-orientation focus on the end deliverable rather than the process. Tiwana and Keil (2004) found synergies between result driven management and high levels of principal knowledge, stating that only such control can be enforced across corporate boundaries as opposed to process control, which cannot. Thus, in their theory only a result driven approach seems feasible when working via virtual work styles which crosses corporate boundaries. *“..if you want to work modern or mobile, then it has to, it needs a different leadership style. It needs a culture of trust and you must lead goal-oriented. Say ... ultimately the results are important, and not on the input or control, or how it was done, but the result must be there. And where the outcome is developed and how, I as a superior should not care.”*, notes a HR manager.

Current work processes are still largely based on hierarchies and traditional strong tie command-and-control structures. With the shift toward organizations with dominant weak ties, more flexible work models with an emphasis on people are necessary. Agile development models, for example, aim to replace command-and-control management with collaborative self-managing teams (Moe, Dingsøyr & Dybå, 2010; Stettina & Heijstek, 2011a). Virtual work styles come with the opportunity to access information anytime anywhere, driving concurrent engineering methods by enabling access through computer aided engineering platforms.

3.5.3 Leveraging Social Media in Corporate Processes

Social media offer platforms where individuals form and maintain weakly tied networks with peers sharing information both professional and private in digital form. Using these technologies for business purposes seems farfetched, alternatively they can bring organizations a way to manage their growing weak tie networks and help leveraging collective intelligence. *“I mean 15 years ago we have to force all the partners to learn how to email, how to use Outlook how to use the calendar in order to have a system in place which is quite effective. [...] I think with the new system in turn that we have in place, with the new wave of communication, well have to make sure that everybody knows of this, an application which we have deemed as important to be efficient.”*, remarks one manager. The widespread proliferation of web tools such as wikis and blogs helped to popularize the idea of collective intelligence (Lévy & Bonomo, 1999; Woolley, Chabris, Pentland, Hashmi & Malone, 2010).

3.5.4 Job Rotation

For leveraging internal knowledge, one of the companies applies job rotation. *“Someone here is a boss for a day [...]. That person is responsible [...]. It rotates; it is someone else each day. [...] Everybody is the boss once. It has proved its value very well.”*, as one R&D manager states. According to some researchers job rotation can lead to organizational benefits

such as accumulating more individual human capital and leading to more knowledge aware organizations where workers are more generalists than specialist (Ortega, 2001; Eriksson & Ortega, 2006; Fægri, Dybå & Dingsøy, 2010). Appearing as “multiskilling” in socio-technical literature (Emery, Thorsrud, Engelstad, Gulowsen & Qale, 1976), job rotation can further contribute to improve knowledge redundancy by integrating knowledge from different domains (Fægri et al., 2010). This can help organizations to find replacements when a certain individual leaves the organization and help to establish a more dynamic workforce.

3.5.5 Dynamic Structures and Self-Management

The respondents perceive that hierarchies, as they currently exist in business organizations, will lose their importance with the next generation of workers. To facilitate organizational structures based on weak ties, which are more dynamic and are more likely exposed to change, literature suggests dynamic network structures. In such organizations individuals act as nodes in a network, working together for a common purpose (Lipnack & Stamps, 1997).

Teamwork research suggests that leadership should be transferred accordingly to the key knowledge, skills and abilities necessary at a moment in time (Pearce, 2004) and shared leadership could function as one possible management style. Self-organizing project teams (Takeuchi & Nonaka, 1986; Stettina & Heijstek, 2011a) have been found successful while studying product development projects, and have been found to have high productivity and increased speed in problem solving in practice (Tata & Prasad, 2004; Fægri et al., 2010).

We can now answer RQ1b: “*How do senior managers aim to address these changes?*”. From our analysis above we may conclude, that our interview participants discuss the following options: (1) Organizational Openness, (2) Result Driven Agile and Concurrent Development Models, (3) Leveraging Social Media in Corporate Processes, (4) Job Rotation, and (5) Dynamic Structures and Self-Management.

3.6 Chapter Conclusions

As a partial answer to RQ1: “*How can governing bodies in organizations of knowledge worker teams understand and steer multiple knowledge worker project teams in practice?*”, we would like to put forward the recommendations provided by our participants: (1) Organizational Openness, (2) Result Driven Agile and Concurrent Development Models, (3) Leveraging Social Media in Corporate Processes, (4) Job Rotation, and (5) Dynamic Structures and Self-Management.

In this manner we presented the results of a naturalistic study conducted with 24 board level executives from 18 Swiss knowledge firms. We found that the executives perceive a growth of interpersonal ties, and that they perceive implications on organizational structures and working models. To provide a theoretical basis we link their perceptions to the existing

theory of strong and weak ties as proposed by Granovetter (1983). As those findings alone provide little advice to practice, we furthermore provide recommendations as applied by the participants in alignment to current literature.

Executives perceive that the relevance of weak ties for knowledge work has increased and bypasses the relevance of strong ties. As weak tie relationships become more numerous and more influential, knowledge workers are aware of the relevance of weak ties for their own professional development. Harmonization of work and personal life makes quality of work more important for the preferences of the individual. Thus, personal values become equally important as those of the company. Many observe that knowledge workers give priority to their network relationship over loyalty to the employer. The war for talent in a knowledge society is fought in terms of attractiveness, which in turn determines the success of an organization.

Work processes based on weak ties require new adaptive working models such as light-weight processes in concurrent engineering or agile software development. What has emerged in the engineering domain is perceived to be applicable for knowledge work at large, in different industries as well as in different functional departments. There is a lack of organizational theory in organizing weak ties and future research needs to generate theory for knowledge work and in particular for specifying the interrelation dynamics located in weak ties, thereby doing justice to both its virtual and its flexible character.

